National Report

On the implementation of the obligations under the

Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

3rd Review meeting of the Contracting Parties

Republic of Latvia

The Radiation Safety Centre
Republic of Latvia
2008

EXECUTIVE SUMMARY

Latvia submits the present report for peer review at the third Review Meeting of the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereinafter: the Convention or JC) at the International Atomic Energy Agency in May 2009. This report demonstrates how the Latvia meets the main objective of the Convention — to achieve and maintain a high level of safety in spent fuel and radioactive waste management, through the enhancement of national measures and international co-operation, including safety-related technical co-operation.

Based on legal requirements and outcomes from the previous two Review meetings Latvia noted that there are two basic commitments for each Contracting Party:

- to prepare and make available a National Report for review,
- to submit National Report to a peer review by the other Contracting Parties.

Therefore, as it was done also in the past, Latvia:

- prepared the third report,
- made it accessible for other Contracting Parties by posting the National Report on the JC web site,
- is ready to review National Reports of other Contracting Parties,
- after receiving the questions and comments about our report will prepare and post answers on JC web site,
- will actively participate in Review Meeting.

This report has been prepared by the Radiation Safety Centre to meet the requirement of Article 32 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. It considers each of the Convention's obligations and explains how the Latvia addresses them.

Latvia recognizes that preparation of the National Report includes a self-assessment and implementation of the safety enhancement measures to meet national and international obligations. We are sure, that international review provides plenty of opportunities for learning from others and the review of the National Report by our peers ensures clarification of issues of special interest, which will serve to justify improvements for action program to enhance safety of radioactive waste management.

The scope of this report is limited to those articles from JC, which are relevant to the particular situation in Latvia, as Latvia does not possess any spent fuel management facility and all spent fuel from research reactor is already sent back to the country of its origin.

The present report is structured according to the Guidelines for national reports under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management established by the Contracting Parties to the Convention (INFCIRC/604/Rev.1). Report is a comprehensive compilation and has been updated on the basis of past reports. It contains changes and new developments since the last report as well as new additional information of explanatory nature answering questions received during the last Review Meeting.

SECTION A
INTRODUCTION

Framework of supervision and implementation

There are two main bodies, which have competences relevant to the Joint Convention:

1. Radiation Safety Centre – the national regulator,
2. Hazardous Waste Management Agency – the radioactive waste management operator.

According to the law "On Radiation Safety and Nuclear Safety" and within the line with "State Administration Structure Law" the Radiation Safety Centre (hereinafter – RDC) is under supervision of Ministry of Environment.

The supervision system is defined in the Act on State Administration, which prescribes that:

- State administration shall be organised in a single hierarchical system. No institution or administrative official may remain outside this system;
- Subordination shall be implemented in the form of control or supervision:
    - Control means the rights of higher institutions or officials to issue orders to lower institutions or officials, as well as to revoke decisions of lower institutions or officials;
    - Supervision means the rights of higher institutions or officials to examine the lawfulness of decisions taken by lower institutions or officials and to revoke unlawful decisions, as well as to issue an order to take a decision in case of unlawful failure to act.

Thus any supervised state institutions have full independence with respect to their decisions in the scope of their competence, which shall be defined by the special act (in RDC case – by Act of Radiation Safety and Nuclear Safety). The minister has rights to examine decisions and request necessary changes if the decisions are in violation of the laws and regulations, in all other cases appeals about decisions of RDC can be done only in the court.

Hazardous Waste Management Agency (hereinafter – BAPA is the state agency and in accordance with the Act on State Agencies has responsibility to manage radioactive waste – to perform public services. The state agencies (also BAPA) are directly subordinated to the ministry (is under control of Ministry of Environment), which has full power to control activities and to decide about tasks and conditions.

Latvia's accession to the Joint Convention

Decision about accession of the JC was made by the Government on 2 February 2000[1]. The Cabinet of Ministers authorized the Ministry of Foreign Affairs to deposit instrument of accession and entitled the Ministry of Environmental Protection and Regional Development to coordinate implementation of obligations under Convention. Since 2004 the tasks relevant to environmental protection is under the Ministry of Environment (part from former Ministry of Environmental Protection and Regional Development), but since 2001 all radiation and nuclear safety issues (including activities relevant to the JC) are under responsibility of RDC.

Latvia acceded to the JC after deposition of the accession document on 27 March 2000 consequently Latvia became the Contracting Party to the Convention on 18 June 2001.

Latvia has participated in all Review Meetings. Latvia submits the present report for peer review at the third Review Meeting of the Convention at the International Atomic Energy Agency in May 2009.

[1] The Order of the Cabinet of Ministers No.50 of 2 February 2000, OJ (Vēstnesis) 36/37, 04.02.2000

SECTION B
NATIONAL POLICY REGARDING NUCLEAR ACTIVITIES

There are no legal changes in national policy regarding nuclear activities in energy sector. Latvia has no any NPP and there is no intention to build such plant in Latvia; however some groups of scientists and experts from energetic sector started to consider possibilities for nuclear energy in Latvia.

Latvia recognizes:

- that the operation of nuclear research reactors has generated spent fuel and radioactive waste along with the fact that other applications of nuclear technologies also generate radioactive waste. More over, the decommissioning of research reactor will generate much larger amount of radioactive waste than during its operational period;
- that main objectives for any society are to ensure safe management for spent fuel and radioactive waste; therefore all activities shall be done by present generations and within a comprehensive framework of radioactive waste management;
- the importance to the international community of ensuring that sound practices are planned and implemented for the safety of spent fuel and radioactive waste management, because only joint activities could solve technical issues and safety concerns;
- that the safety non-compliance in one single country could imply stronger requirements in other countries and reduce public acceptance for such practices;
- the importance of informing the public on issues regarding the safety of spent fuel and radioactive waste management due to a vital need for public acceptance as waste management activities lead to long term impacts and significant investments, therefore without such acceptance it is impossible to reach safety objectives;
- that requirements for public information are defined as obligations under other environmental protection agreements, which also have direct relation to the constitutional rights of citizens;
- that the ultimate responsibility for ensuring the safety of spent fuel and radioactive waste management rests with the State.

Review of Low Level Waste management policy

Latvia recognizes the importance to develop national strategy and long term plans for radioactive waste management. We have to establish and keep updated a national program for the safe management of radioactive waste and spent fuel that includes all radioactive waste and covers all stages of management. Fortunately, the end point for spent fuel (hereinafter – SF) is defined (and achieved). There is general agreement on end point for long-lived waste (search for multilateral solutions), but not clear implementation measures. More challenges, which shall be met, are definition of specific measures, prioritisation of them and introduction of comprehensive set for indicators, because financial situation in the state sector did not allow to plan and to ensure resources.

Due to changes in the state's system for the development of binding documents, which may have long term liabilities and imply financial obligations, currently it is impossible to get acceptance from the Government for the strategies which cover more than 3-5 years period. It means that we can work only on short term and in some cases also medium term objectives.

Therefore Ministry of Environment introduced only minor adjustments in the "Radioactive waste management plan", which had been accepted by the Government in 2005. Adjustments just reflect current stage of decommissioning, status for preparations for building of two new vaults and long term storage for waste, which are not suitable for disposal off in near surface.

Similarly, changes have been introduced also in the mid term strategy for environmental protection, which defines plans for the activities of the Ministry and its subordinated institutions.

All these issues – how to solve challenges related radioactive waste, will be incorporated into the strategy for the activities of RDC and eventually also for BAPA (currently, state agencies are not to obliged to prepare, to negotiate and to get acceptance from supervisor of their strategies).

The most recent decisions are related to the State budgetary situation, as Latvia has and will have for few years very tight budget for the Governmental expenses, thus there will be very small investments for decommissioning and also for development of radioactive waste management. More over all state institutions and agencies have to reduce number of staff and also cut down the budget.

Unfortunately, such changes could be reduction of capabilities for the regulator and also for operator to fulfill the tasks allocated to them.

SECTION C
SCOPE OF APPLICATION

Latvia has no intention to use reprocessing services, the spent nuclear fuel defined as the radioactive waste. This issue is incorporated also in the draft amendment of the framework law, which should be approved before the end of year 2008.

There is no any large scale facility or processes in which natural occurring radioactive materials are processed and are treated as radioactive waste, but there were several incidents with enhanced radioactivity of metal scrap imported from other countries for the metal smelting plant, thus minor amounts of such materials had been treated as radioactive waste.

Latvia has no any military facility which generates spent nuclear fuel, currently minor amounts of radioactive waste from defence related activities (e.g. markers on the guns with radium containing luminescent paint) are treated in the same manner as civilian radioactive waste.

In the past (during the time period under former Soviet Union) national radioactive waste management facility "Radon" received relatively large amount of defence related radioactive waste, which still constitute significant part of total radioactivity of the disposed radioactive waste. More detailed information could be found in the first national report [Section I, Annex (g)] and also in publication under NATO research program [Section I, Annex (i)].

SECTION D
INVENTORIES AND LISTS

There are above 900 licensed operators under supervision and control of the RDC, among them there only around 50 operators generate radioactive waste. Total inventory of radioactive materials and sealed radiation sources is around 5000 starting from very small sources for smoke detectors (containing mostly Pu) up to high activity sources from blood irradiator and teletherapy equipment.

Latvia has no nuclear facilities according to the definition of this Convention; however some provisions are applicable for Soviet design pool type research reactor, which was shutdown in June 1998.

Radioactive waste in Latvia originates exclusively from civilian programmes. The main potential producers of radioactive waste are:

a) Traditional areas:

- **medicine** – radiotherapy: ^{60}Co, one hospital, 57 TBq in total;
- **research** – two facilities: ^{60}Co (irradiator), 138 TBq and 85 TBq; one high flux neutron sources of Pu-Be 1,2 TBq;
- **industry**: irradiation, nuclide gauges, calibration –Cs-137 (~38 TBq) and well logging – Am-Be (115 GBq);

b) Specific areas:

- Decommissioning of Salaspils Research Reactor – the foreseen total volume of radioactive waste ~1200 m^3;
- management of contaminated scrap metal, which was imported either for reprocessing or transit purposes.

SECTION E
LEGISLATIVE AND REGULATORY SYSTEM

Article 18. Implementing measures

The Hazardous Waste Management Agency

The main operator in Latvia is the State Agency "Hazardous Waste Management Agency".

In the past it was the state agency for radioactive waste management "RAPA" with the main tasks to safely maintain Salaspils research reactor in the shutdown stage and to manage radioactive waste repository. Later on, based on the decision of the Government, more tasks for RAPA were added in relation to the management of other types of waste (mainly toxic chemical waste), thus RAPA became as BAPA.

BAPA is subordinated to the Ministry of Environment, which through State budget and other extra-budgetary sources, provides funds for safety upgrades and decommissioning.

Obligations under the Joint Convention have been implemented in national laws, Cabinet of Ministers regulations; besides, the Concept of the Management of Radioactive Waste defines some additional tasks and measures related to International Conventions. The list of relevant legal documents is provided in the Section I, Annex (f).

A summary of results from the monitoring programme is given in Annex 2. The results include:

Monitoring at on-site locations:

- γ-radiation dose rates in air, at different locations in the controlled area and supervised area, in monitoring wells and in buildings; γ-dose rates in monitoring well are mostly due to γ-radiation from activity in the soil due to partial shielding of cosmic and solar radiation and airborne activity;
- β and α-contamination of workplaces and surfaces in the buildings;
- Specific ground water activity levels in monitoring wells (onsite and close the site boundaries);
- Specific activity levels in air samples from monitor in the B-zone.

Monitoring at off-site locations:

- Specific activity levels in air samples;
- Specific activity in soil samples;
- Specific activity levels in plant samples;
- Specific water activity levels in water reservoirs in the vicinity of site;
- Specific activity level in precipitation.

Implementation measures of legal requirements

According to the decommissioning concept spent fuel was stored in the wet storage tank adjacent to the reactor pool. It was moved out of Latvia (in May 2008) within the framework of USA–IAEA–Russia co-operation project and Latvia–Russia governmental agreement on co-operation in the spent fuel management, until then storage conditions.

Article 19. Legislative and regulatory framework

Legislation in Force

The Law on Radiation Safety and Nuclear Safety came into force on 26 October 2000. The law governs all activities involving radioactive or nuclear materials and all sources of ionizing

radiation. It establishes the basic principles of radiation and nuclear safety (justification, optimisation and limitation) and also contains provisions on nuclear third party liability.

Operators of radiation facilities must provide all necessary information to the RDC showing that safety measures are being applied. RDC may then deliver licenses (for commercial activities) or permits (for non-commercial activities), for the case. The RDC may at any time withdraw or revoke licenses or permits if radiation protection and nuclear safety requirements are not met.

There are no major changes since the second peer-review Conference. Several regulations had past minor modifications e.g. Statutes for RDC, Statutes for Radiation Safety Board, radiometric control on the state border, licensing regulations etc.

Article 20. Regulatory body

The Radiation Safety Centre is the national regulatory authority in the field of radiation and nuclear safety. Radiation Safety Centre has licensing, supervisory and control functions, maintains relevant databases. RDC together with representatives from other state institutions and professional associations deals with certification of radiation safety and nuclear safety officers and recognition of radiation and nuclear safety experts.

RDC was established in July 2001 based on the framework law "On Radiation Safety and Nuclear Safety", which entitled the Government (the Cabinet of Ministers) to issue regulations "Statutes of Radiation Safety Centre" and also empowered the Cabinet of Ministers to issue (in majority of cases re-issue updated regulations, as the system for radiation and nuclear safety was established already in 1994 based on the previous act with the same title) regulations, which needed to implement requirements prescribed by this Act.

Functions of the RDC related to implementation of the Joint Convention are defined by legislation, and include to:

- draft policy proposals for supervision and control of radiation and nuclear safety;
- supervise and control radiation safety;
- license practices with radiation sources;
- coordinate combat of illicit trafficking of radioactive and nuclear materials;
- encourage introduction of new technologies to minimize the possible harmful effects;
- co-ordinate technical cooperation in the field of radiation safety;
- prepare national reports;
- assess implementation of international recommendations;
- maintain data bases on practices, sources and exposures.

The Law on Radiation Safety and Nuclear Safety states that – "*State supervision and control in the radiation safety and nuclear safety field is independently carried out by a state regulatory authority called the Radiation Safety Centre, which is supervised by the Ministry of Environment*".

The system of state authority under supervision of relevant ministry, which has no functions in the uses and promotion of atomic energy assure that RDC is an independent national authority and can implement its decisions also independently from its supervisor.

The finances for RDC are granted annually by Saeima (the Parliament) as separate budget line, including portion of incomes from the services provided by the RDC to radiation workers – TLD measurements. The RDC own income constitutes less than 30% from the total budget, such level assures no potential negative impact from the services to main functions – supervision and control.

Since first peer-review Conference the only changes for RDC are further upgrades of its technical capabilities and introduction of comprehensive management system (including quality management based on relevant ISO standards).

SECTION F
OTHER GENERAL SAFETY PROVISIONS

Article 21. Responsibility of the license holder

To obtain a license, the applicant must complete an application, which along with other documents, will be reviewed by the RDC. Once delivered, a license is usually valid for three years. However, any license may be subject to revocation should a violation of safety standards be detected during inspection. Upon expiration, the license is not automatically renewed, and a new application must be made.

According the Law on Radiation Safety and Nuclear Safety the license holder has prime responsibility on safety. These provisions are not changed.

The "BAPA" is the only organisation in Latvia dealing with maintenance of nuclear facilities and management of radioactive waste. "BAPA" is the license holder for the relevant activities subject to this Convention, in particularly, for interim storage of the spent fuel (which has been already removed to Russia), for ensuring nuclear safety without power and safe maintenance of relevant equipment of the research reactor as well as for a complete cycle of radioactive waste management.

Article 22. Human and financial resources

"BAPA" is mainly financed from the State Budget. The Ministry of Environment explains and gives proof to the Government concerning adequate funding for each fiscal year and long term programmes. The Ministry provides also extra funds from its resources (including extra-budgetary resources from Latvian Environmental Protection Fund) and assists in finding donors by maintaining cooperation with international organisations.

For decommissioning of research reactor the Cabinet and for implementation of the Concept of Radioactive Waste Management the Government shall allocate additional financial resources.

For staff training and qualification upgrading the Latvian Environmental Protection Fund, EC, Sweden and RDC provided finances for preparation of the radiation protection manuals. Latvian University has established radiation protection course for the workers and job supervisors. Qualification upgrading is also implemented in the frame of EU projects and is a precondition during the licensing process.

Article 23. Quality assurance

The quality assurance programmes are requested by the Cabinet Regulations on Protection against Ionising Radiation.

Detailed requirements to QA programmes are also in Regulations on Radiation Protection during the Transport of Radioactive Materials (including radioactive waste) as well as Licensing Regulations prescribing a special request of QA and stating that the license must be issued for a shorter time period, if the QA programme is either not adequate.

„BAPA" has implemented a quality assurance system, which comply with all aforementioned requirements, appreciated by RDC by issuing in appropriate licences. "BAPA" has also accreditation for certain laboratory activities under ISO 17025 standard.

Article 24. Operational radiation protection

Discharges are specified and quantitatively limited by Regulations on Practices Involving Radioactive Waste and Related Materials. Environmental situation is controlled in accordance with the control programs for national monitoring and also by operator.

Proper level of operational radiation protection as well as of control on discharges and unplanned/uncontrolled releases is provided by the Quality Assurance System of "BAPA" and State Control Program for the Ionising Radiation Facilities of National Significance.

The System of Accounting and Transfer of Radioactive Waste of "BAPA" provides that all physical objects being in the control zone of the Research Reactor and not being necessary for its further maintenance, initially are considered as radioactive waste or related materials. RDC receive also regular reports from the operator and approves the free release of exempted materials.

Additional dose limits related to radioactive waste management are specified in Requirements for the practices with radioactive waste and related materials, namely:

> *If, based on the results of environmental monitoring and on the long-term safety assessment, it is identified that the potential exposure dose to the members of the public living in the direct vicinity of a radioactive waste disposal facility, is:*
>
> > *1) Above or equal to 5 mSv/year, obligatory measures must be taken to bring the situation to normal and to reduce radiation dose less than 300 μSv/year,*
> >
> > *2) Between 1 and 5 mSv/year, respective measures must be taken during over the next five years to bring the situation to normal and to reduce radiation dose less than 300 μSv/year,*
> >
> > *3) Less or equal to 1 mSv/year, the implementation of measures is considered on the basis of the financial and technical capabilities;*
>
> *The maximal exposure dose to the critical group of population shall not exceed 100 μSv/year, but maximal average dose – 10 μSv/year.*

"BAPA" has a qualified emergency response group for mitigating the effects of unplanned release of radioactive materials into the environment, should such occur.

There is no any case were radiation workers of "BAPA" received external exposures above 6 mSv/year (1/3 from the dose limit), in majority cases the doses are on the level 1-2 mSv/year, which demonstrate that operational safety measures corresponds to good practices.

Article 25. Emergency preparedness

The Law on Radiation Safety and Nuclear Safety sets the requirements for immediate flow of information regarding radiation accidents and emergencies, namely

> *The job manager reports immediately to the operator, the Centre and the State Fire Protection and Rescue Service upon all accidents and incidents, which occur during practices involving ionising radiation sources.*

According to the Law on Civil Protection, in Latvia the main institution responsible for planning and implementation of emergency preparedness is the Fire and Rescue Service.

Based on above mentioned laws the Cabinet accepted the regulations on preparedness and response in cases of radiation accidents and the annually approves the *National Emergency Preparedness Plan* (there are no significant changes annually on the subject matters, but as always some minor changes on institutional level and operational procedures – mainly the technical annexes of the Plan are changed annually).

There are no changes in allocation of responsibilities for governmental bodies co-ordinating the actions in the case of an emergency. They are the State Fire and Rescue Service and the Radiation Safety Centre:

- RDC is responsible for supervision of operative actions at the accident site.
- A larger scale accident activates are supervised and co-ordinated by the State Fire and Rescue Service.

Some other requirements for the emergency planning and response are set out also in some several regulations e.g. on Protection against Ionising Radiation, on safe transport, on licensing etc.

"BAPA" has implemented 2 local plans, in agreement with relevant local municipalities:

- Preparation for and Action in the Case of Accident in Salaspils Research Reactor;
- Preparation for and Action in the Case of Accident in the Baldone Radioactive waste disposal site.

There are no changes on regional level – according to the Agreement signed by all states in Baltic Sea region the states concerned have to provide data from their monitoring stations to all parties of the Agreement. Latvia (RDC) participates also in EU EurDep network and uses CoDec system for data exchange.

There are no new bilateral agreements since last report, but practical implementation of emergency plans and data exchange had been tested in international and regional exercises and also on bilateral level (between RDC and Ukraine regulatory authority).

The draft has been elaborated for bilateral Latvia-Russia Agreement.

Regulations on Preparedness for and Actions in the Case of Radiation Accidents foresee that appropriate training for the testing is necessary for the testing of the emergency plans. Such training is carried out on regular basis, providing the opportunity to test the different levels of organization and improve the key aspects of the emergency planning.

By financial support of EU (Phare 2003) the training and teaching materials have been developed and the practical exercises both for emergency response of RDC and RDC activities with respect to illicit trafficking case were organised in 2006.

Article 26. Decommissioning

Decommissioning and dismantling of the Salaspils nuclear reactor is an ongoing process according to the Cabinet resolution from October 1999, which was slightly modified in 2004. Decommissioning and dismantling of the Salaspils nuclear research reactor is to be carried out until so called "brown field" status, which means, that infrastructure will be used for establishment of national cyclotron centre to replace loss of possibilities for nuclear related research and for production to short lived isotopes, which will be used for diagnostics.

Since the Concept for decommissioning was approved by the Government in 1998, the current operator of facility – Hazardous Waste Management State Agency has reached around 20% implementation level of all activities planned for decommissioning.

Financing: Special funds and extra financing have been allocated by Saeima and Cabinet.

Environmental Impact Assessments for decommissioning and expansion of radioactive waste repository were accomplished in 2005. Additional studies for updates of decommissioning project including definition for further activities of the site were made and the latest decisions on these subjects were done in July 2007 by the Cabinet of Ministers (the finishing of the review of the EIA final report).

According to the decommissioning concept, approved by the Cabinet of Ministers in 1999 (updated concept was approved in 2005) the decommissioning of the research reactor is envisaged by the end of year 2010.

SECTION G
SAFETY OF SPENT FUEL MANAGEMENT

Article 4. General safety requirements

Legal framework

There are no major changes Latvia in the framework of legal document regarding safe management of spent fuel. The system is based on three main pillars:

1) **International legal instruments** to which Latvia is the Party;
2) **EU legal instruments;**
3) **National regulations**.

Since May 2004 several legal documents had been adopted (e.g. EU regulations replaced national regulations) and modified (some additional provisions form EU directives and recommendations had been incorporated in national regulations), but as already in late 90^{ies} of last century Latvia worked on preparations of legal framework in harmony with system used in EU, there are no major changes.

Article 5. Existing facilities

Background information

There are no major changes regarding the existing facilities. Latvia used to have a Nuclear Research Centre with a pool type 5 MW_{th} IRT reactor. The Cabinet of Ministers in 1995 made the decision to start preparations for the decommissioning and in 1998 the second decision was made about permanent shutdown of the reactor. Presently a state agency Hazardous Waste Management Agency "BAPA" manages the decommissioning project of this research reactor.

There was small radioactive waste storage on the site of research reactor (in operation since 1975-2005) where some parts dismantled from reactor core were stored after reconstruction activities in 1975. All the waste after characterisation and re-packing was transferred to the radioactive waste repository at Baldone.

Article 6. Siting of proposed facilities

Latvia has no plans to establish spent fuel management facility; therefore these provisions are only partly incorporated in national nuclear legislation.

Should such legal acts be needed, the system and steps for the licensing of nuclear facilities and major modifications to such facilities are prescribed in the Licensing Regulations "*On the Procedure of issuing of a Special Permit (Licence) or Permit for Activities involving Ionising Radiation Sources and Procedure for Public Dispute on the Establishment of Ionising Radiation Facilities of State Significance or Essential Modifications thereto"*.

The Law on Environmental Impact Assessment and relevant Cabinet Regulations governs potential evaluating of relevant site-related factors likely to affect the safety of facility. The Law on Environmental Impact Assessment prescribes requirements for assessment of impact of proposed nuclear facilities on the environment. The mechanism of public hearing is established by licensing regulations. Proper communication with nearby contracting parties of JC and Nuclear Safety Convention is governed by ESPO Convention having been ratified.

Article 7. Design and construction of facilities

As there is no government plan to build any nuclear facility, these provisions are only partially incorporated in national nuclear legislation. In general legislation, the potential necessary provisions are introduced by the Law on Radiation Safety and Nuclear Safety, the Law on Conformity Assessment, Basic safety regulations and Licensing Regulations.

However, due to aggravating global and local energy resources and supply problems, on the level of experts has been put forward question about the necessity to build NPP in Latvia after 2030.

Article 8. Assessment of safety of facilities

Provisions related to the safety assessment for nuclear facility are only partly incorporated in legislation because currently no new facility is planned. Should such necessity be raised, the legal basis for the safety impact assessment is given in the Law on Environmental Impact Assessment.

Recommendations from IAEA Nuclear safety standards (NS.R.2) regarding PSR are incorporated in national legal system by re-licensing – regulations on licensing[2] provide requirements for reviews of all safety aspects of radiation facility, including on- and off-site emergency planning and radiation safety. Regulations stipulate that re-licensing shall be done on 3 years base if there are no objections or special conditions.

Other safety assessment requirements are partly elaborated in Regulations on Activities including Nuclear Materials and Regulations on Physical Protection.

The safety assessment for reactor in safe enclosure stage and also for decommissioning is made with respect the Law on Environmental Impact Assessment and relevant Licensing Regulations.

The general public and any municipal or other institution in relevant regions should have access to information concerning the evaluation of potential threat from nuclear facilities, as prescribed by the Licensing Regulations. Information about planned activities and major modifications of nuclear and radiation facilities should also be provided to the public.

Article 9. Operation of facilities

1) Provisions on safe storage of the spent fuel (including its maintenance, monitoring, inspections and testing) have been elaborated in the Cabinet of Ministers Regulations on Activities including Nuclear Materials, Related Materials and Equipment and Regulations on Physical Protection;
2) Relevant activities have been carried out in compliance with the License issued by RDC for interim storage of the spent fuel, for ensuring nuclear safety without power and safe maintenance of relevant equipment of the Research Reactor;
3) Inspections, accounting and reporting are carried out in compliance with national (and EU) Regulations and International Conventions (Safeguards Agreement, Additional Protocol, etc.).

RDC regularly provides inspections to verify compliance with legal requirements – according the Law on Radiation Safety and Nuclear Safety any nuclear facility is "*ionising radiation facilities of state significance*", thus according the roles of procedure for RDC the regular

[2] The Cabinet Regulations on the Procedure of Issuing of a Special Permit (Licence) or Permit for Activities Involving Ionising Radiation Sources and Procedure for Public Dispute on the Establishment of Ionising Radiation Facilities of State Significance or on Essential Modifications thereto, No.301 (03.07.2001)

planned comprehensive inspections are carried out not less than 4 times per year, in addition to regular topical inspections are organised (e.g. on safeguards issues together with IAEA and EU inspectors) and for any safety significant activity, which is planed by the operator.

Article 10. Disposal of spent fuel

The spent fuel has been moved out of Latvia in accordance with internationally agreed practice – return to the supplier.

In May 2008 the spent nuclear fuel has been transported to the Russian Federation in the frame of IAEA-USA-Russia agreement.

SECTION H
SAFETY OF RADIOACTIVE WASTE MANAGEMENT

Article 11. General safety requirements

Legal background

According to the Cabinet Regulations on Practices Involving Radioactive Waste and Related Materials the radioactive waste is classified in several groups, *inter alia*, also according the amount of generated heat power for high activity waste.

Criticality issues are specified in Regulations on Protection against Ionising Radiation in Transportation of Radioactive Materials, which set up also limitations on radioactivity content in packages/containers.

According to the law **"On Natural Resources Tax**" and the law **"On Radiation Safety and Nuclear Safety"** – in the case of import into the Latvia of radioactive substances that, after use thereof, generate radioactive waste which needs to be disposed of in Latvia, **a natural resource tax is payable on the import of such substances.**

According to the Regulations of the Cabinet of Ministers the operator, who plans to import sealed ionizing radiation sources, containing radioactive materials whose radioactivity when using given sources for a period of 10 years will exceed 100 MBq, prior to acquisition of said sealed ionizing radiation sources into possession or tenure, must take all possible measures so that possibility to send back mentioned sealed sources to the producer be specified in the purchase and sales contract or in the grant agreement.

In case when the purchase and sales contract or the grant agreement does not contain provisions on send-back of disused sealed sources to producers thereof:

i. other possible suppliers must be sought or;
ii. requirement to pay a fee for import of radioactive substances into Latvia.

The following legal acts directly governing radioactive waste management are:

1. The Law "On Radiation Safety and Nuclear Safety";
2. The regulations of the Cabinet of Ministers "Requirements for the Practices with Radioactive Waste and Related Materials";
3. The regulations of the Cabinet of Ministers "The Principles of Determination of the Equivalence of Various Radioactive Waste."

As practices with radioactive waste are in the same time also practices with radiation sources all other regulations are applicable (e.g. basic safety requirements, requirements for physical protection, safe transport, etc.).

Strategy for radioactive waste management

A Concept of the management of radioactive waste was approved by the Cabinet of Ministers in 2002, which was elaborated, based on:

a. **IAEA *generic*** principles for radioactive waste management,
b. ***Site-specific*** conclusions recommendations of CASSIOPEE study on Safety Assessment of Baldone repository,
c. National legislation and other **site-specific items** (conditions, government documents, planned tasks) and foresees the solutions for the safe management of radioactive waste in the nearest 5–10 years (the time period from 2003 till 2010).

Article 12. Existing facilities and past practices

Operator of radioactive waste management

A "BAPA" is the sole organization in Latvia dealing with all stages of radioactive waste management, including processing, conditioning, transportation long-term storage, and disposal of radioactive waste. "BAPA" has two main sites – research reactor site in *Salaspils* dealing with safe enclosure of research reactor and decommissioning activities thereof; and the near surface radioactive waste repository "Radons" in *Baldone*.

For technical details see more in the Annex 1-2 of this report.

Implemented measures

1) In 2007 a sampling equipment for radioactivity monitoring in the atmosphere was installed and commissioned;
2) In 2007 re-filling the vault 2 with RW and its final conservation (closure) has been completed.

Planned measures

According to the Concept and outline design:

1) Two new vaults should be build,
2) The new long term storage is planned to ensure safe storage of waste (including spent sealed sources), which are not suitable for the disposal in near surface.

Article 13. Siting of proposed facilities

The required measures are provided by the set of legislation acts, in particular:

1. The Law "On Radiation Safety and Nuclear safety" stating that "*The job manager, either directly or through the media, informs members of the public about radiation safety and nuclear safety measures carried out or proposed at the site concerned*".
2. The Licensing Regulations "On the Procedure of issuing of a Special Permit (Licence) or Permit for Activities involving Ionising Radiation Sources and Procedure for Public Dispute on the Establishment of Ionising Radiation Facilities of State Significance or Essential Modifications thereto", by requiring 4 major steps to be made prior to of the facility, and establishing the mechanism of public hearing;
3. The Law on Environmental Impact Assessment governing potential evaluating of relevant site-related factors likely to affect the safety of facility, and prescribing requirements for assessment of impact of proposed nuclear facilities on the environment.

Article 14. Design and construction of facilities

These provisions have been incorporated in general legislation: by the Law on Radiation Safety and Nuclear Safety. The Law on Conformity Assessment, the Law on Environmental Impact Assessment, National BSS and Licensing Regulations must also be observed and complied with.

These legal provisions are used by RDC to prepare license conditions for "BAPA" and for authorisation of any changes relevant to the safety of facility.

Article 15. Assessment of safety of facilities

Current plans for building of new waste storage spaces in Latvia have been elaborated on the basis of recommendations derived from Long-term safety analysis of the Baldone repository performed by CASSIOPEE in 2001-2002:

- to build a dedicated long storage for spent sealed sources and long-lived waste,
- to modify disposal vault's design to meet best available practices in other countries.

The anticipated radiological impact of the new building vaults has been evaluated in the frame CASSIOPEE analysis and more recent EIA (in 2004-2005), including applicable criteria, conditions, input data, hypotheses advanced methodologies (ISAM) and computing tools (RESRAD and Microshield 5) as well as recommended corrective measures.

EIA was performed on the construction of two new radioactive waste vaults and a facility for the long-term storage of spent sealed sources at the radioactive waste disposal site "Radons", including a safety assessment (in co-operation with the Netherlands enterprise Nuclear Research and Consultancy Group (NRG)). This EIA was updated (reference inventories: December 31, 1999 vs. January 2005) and extended (increased timeframe) version of the previous one.

In the frame of the EU Twinning Light Project "Radioactive Waste Management and Reactor Decommissioning" comprising, inter alia, an objective to up-date waste acceptance criteria for radioactive waste disposal at Radons, an International team, in collaboration with RDC, has evaluated of the updated safety assessment in the frame of the Project part "The Use of Safety Assessment Methodologies for Near Surface Disposal Facilities in Latvia", evaluating the whole set of SA documentation and, as a result, giving a set of recommendations in particular, for improvement of modelling of water path, including model the system as specific as possible, to use an update version of RESRAD code as well to restrict the use of default models.

For advanced water path modelling it would be relevant to use site-specific geosphere data, taking into account IAEA recommendations. The derived conclusions and recommendations of the regulatory evaluation of Baldone near-surface radioactive waste repository will be used for forthcoming licensing process of construction of two new radioactive waste vaults and a facility for the long-term storage of DSS at Radons site.

Article 16. Operation of facilities

Licensing procedures

The licensing procedures for nuclear facilities are regulated mainly by set of licensing regulations, which cover the conceptual stage, design, construction, commissioning and operation of the facility. The operation license is valid for a period of 3 to 5 years.

The last license issued to the operator of radioactive waste management facility is based on conclusions obtained from Long-term safety analysis of the Baldone repository and EIA study as well as the EU Twinning Light Project Radioactive Waste Management and Reactor Decommissioning. RDC is assessing compliance to requirements with national legislation, existing standards. All safety related instructions; guidance and Quality Assurance programmes prepared by Operator had been analysed and accepted by RDC.

Assurance of engineering and technical support

Radioactive waste management is mainly funded from the State budget, thus assurance of support in safety related fields are considered annually and the Ministry of Environment, which can provides extra resources if needed.

External engineering and technical support is provided in the frame of the relevant IAEA Technical Co-operation Projects, EU (PHARE Projects and other EC funded activities), by co-operation with USA (Department of Energy) etc.

Radioactive waste characterization

Provisions for characterization and segregation of radioactive waste are in national regulations.

Waste characterization and sorting is provided by the producer and introduced in the regulations, which for radioactive waste segregation foresee that *waste* ***producer*** *(owner)* ***ensures*** *such conditions:*

- ***Each*** *waste* ***container*** *shall contain* ***only 1*** *respective group of radioactive waste;*
- *shall* ***prevent*** *in a container a* ***mixing*** *of:*
    - *radioactive waste subject and, respectively, not subject to treatment;*
    - ***long-lived*** *and* ***short****-lived radioactive waste;*
    - *low and intermediate level waste with high level radioactive waste.*

Incident Reporting system

The provisions required reporting of incidents have been implemented in the Law on Radiation Safety and Nuclear Safety – the job manager informs state and local government institutions and, either directly or through the media, informs members of the public about potential incidents, accidents and the necessary measures for protection of members of the public in the event of an accident. Fortunately, there was no such event up to now. The minor deviations from safety requirements are registered by operator and discussed with RDC inspectors during the planned inspections. The corrective actions are always prepared and implemented.

Provisions regarding operating experience

Provisions regarding collection and analysis of experiences have been implemented in the Law on Radiation Safety and Nuclear Safety, setting up to the Radiation Safety Centre, inter alia, following obligations:

- *to collect, analyze and submit information to the Radiation Safety Board and major users of ionising radiation sources on the radiation safety situation in the country,*
- *to encourage introduction of new technologies to minimize the possible harmful impact resulting from the ionizing radiation sources.*

Provisions regarding decommissioning of radioactive waste management facilities, closure of a disposal facility

Regulations dealing with licensing and with preconditions for applicants request to elaborate future decommissioning plan for any facility where radioactive materials are envisaged to be used. During application for first license an outline for decommissioning plan is requested, which is updated during entire operational period receiving each next license.

Cabinet Regulations „Requirements for the Practices with Radioactive Waste and Related Materials" foresee before closure of the disposal facility a detailed consecutive implementation of a set of measures with an aim to upgrade safety. The possibilities for implementation of these requirements are subject to licensing conditions.

Article 17. Institutional measures after closure

Provisions related to activities after closure of facility are implemented and in detail specified in Cabinet Regulations „Requirements for the Practices with Radioactive Waste and Related Materials".

There are no major changes for these requirements; some minor suggestions are elaborated during the EIA study.

SECTION I
TRANSBOUNDARY MOVEMENT

Article 27. Transboundary movement

Basic provisions of this Article have been implemented in Cabinet of Ministers "Regulations on the Procedure governing Activities involving Nuclear Materials, Related Materials and Equipment", regulations "Requirements for the Practices with Radioactive Waste and Related Materials" as well as "Regulations on General Principles of Exchange Procedure of Different Radioactive Waste", requiring, in general, agreement of the state of destination and – in case of the spent fuel – agreement with IAEA. Return to the supplier of the spent fuel from Latvia had been done in the frame of the IAEA-Latvia-Russia Project.

In Regulations "Requirements for the Practices with Radioactive Waste and Related Materials" set up that:

- *RDC forwards an application for the permit to export radioactive waste and the corresponding Permission Form to the Authority of that state where it is planned to carry out waste reprocessing and to Authorities of all those states whose territories will compose the transportation route of this waste, followed by an relevant request to give a corresponding conclusion;*
- *RDC is authorized to issue a permit to export radioactive waste for its re-processing only after receipt of official permit from the Authorities of all those states to whom RDC had forwarded the permit to export radioactive waste for the purpose of its re-processing.*

Currently these regulations are amended in order to bring into the force the rules of the Council Directive 2006/117/EURATOM on the Supervision and Control of Shipments of Radioactive Waste and Spent Fuel. The Amendments are planned to be accepted till 25 December 2008.

SECTION J
DISUSED SEALED SOURCES

Article 28. Disused sealed sources

Proper possession and accounting of disused sealed sources is provided by the requirements of the Law on Radiation Safety and Nuclear Safety, setting up to the RDC following obligations:

- *to ensure identification, investigation and assessment of unknown ionising radiation sources discovered on national territory, or of undeclared ionising radiation sources discovered at the state's border, and to organise disposal thereof should it fail to be possible to identify the user or the owner of a radiation source;*
- *to ensure accounting of ionising radiation sources; to establish and update data bases on radioactive substances, nuclear materials, radioactive waste and other ionising radiation sources.*

Management of disused sealed sources is prescribed also by the requirements by set of regulations on licensing and on regulations on "Requirements for the Practices with Radioactive Waste and Related Materials".

Based on these legal provisions and some experiences for practical implementation Latvia sent notification to the IAEA about implementation of Code of Conduct and recommendations for transboundary movements.

Practices towards safe disposal of disused sealed sources

Practices towards safe disposal of disused sealed sources are implemented on the basis of CASSIOPEE Recommendations (including also Design Criteria for a Centralized Spent Sealed Sources Facility), which were used to prepare outline design for long term storage of sources and radioactive waste, which are not suitable for disposal in near surface (implementing the PHARE project "Design of additional waste disposal vault and integral storage facility for long-lived waste").

The Cabinet of Ministers regulations "Requirements for the Practices with Radioactive Waste and Related Materials", which together with the Law on Natural Resource Tax encourage return of disused sources to their producers.

Practices towards safe final disposal of long-lived disused sealed sources Latvia is accomplishing by seeking and evaluating possibilities to use regional disposal option, thereby, via informational co-operation with the:

1. EC regional project SAPIERR (Support Action: Pilot Initiative for European Regional Repositories) integrating the countries wishing to explore the feasibility of regional solutions for the deep final disposal, and has submitted to SAPIERR administration the data on radioactive waste inventory to be disposed in a deep disposal site,
2. The Ministry of Environment will ensure resources for 2009-2010 for the participation in the Working Group, which will explore the feasibility to establish "European Repository Development Organisation" (ERDO),
3. The ERDO should continue practical activities initiated within SAPIERR project and by *ARIUS* (Association for Regional and International Underground Storage).

SECTION K
PLANNED ACTIVITIES TO IMPROVE SAFETY

As the main problems are related to the tritium in the ground water, then in nearest few years the main planned activities are with the aim:

1. to investigate in more details the situation,
2. together with IAEA experts elaborate mitigation measures.

For investigations of tritium contamination:

1. Two new boreholes should be establish next to the boreholes B3 and B4 (downstream for underground water flow), to expand possibilities for monitoring of the situation.
2. Three new boreholes for monitoring of the situation nearby old radioactive waste vaults (in vicinity of vaults 3, 4 and 5). Such planned location of monitoring points related to the assumptions that tritium leakage is from vaults 4, 5 and/or 6.

Another type of activities are related to safety improvements, which are connected with the building of two new vaults, interim storage for long lived waste and final capping of old vaults, but there is no sufficient funding, thus time schedule for such activities is not yet clear.

SECTION I
ANNEXES

(a) List of spent fuel management facilities

No any, but till May 2008, the BAPA maintained spent fuel storage.
The spent HEU nuclear fuel was stored in the storage basin, which is adjusted to the reactor pool.

(b) List of radioactive waste management facilities

There are two main facilities:

1. Radioactive waste disposal site "Radons";
2. pre-treatment and conditioning facility at Salaspils site, which has also store for conditioned cemented radioactive waste to be collected and ensure proper before transportation to the disposal site.

Basic information about facility

"Radons" was commissioned in October 1962. The site is located at a hill that rises up to a level of 35 m higher than the territory surrounding it. In the vicinity of the site, the level of groundwater is 18 m below the earth surface. Hence, penetration of groundwater into the near-surface vaults for radioactive waste disposal is minimised. There is a zone with radius of 1 km around the centre of the site where no residential houses are found.

The "BAPA" shall ensure also storage of all long-lived radioactive waste until the establishment of a geological repository or finding of other solution. The institutional control after the closure of the repository is foreseen for the period of 300 years.

The site of "Radons" covers an area of 7 hectares. A general lay-out of the site is given in Fig.1. The operator-controlled area (i.e. the site) is divided in a controlled area (the B-zone) and a supervised area (the A-zone). The physical boundaries of the premises and buildings are used as a boundary of these areas (zones).

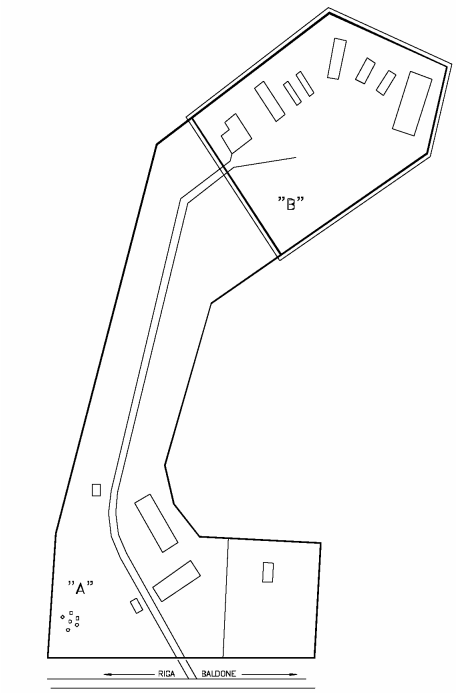


Figure 1. Arrangement of the radioactive waste disposal facility

(c) List of nuclear facilities in the process of being decommissioned

Salaspils research reactor under decommissioning. It is defueled, all spent and not irradiated HEU is sent back to the country of origin.

(d) Inventory of spent fuel

Nothing remains at the site.

(e) Inventory of radioactive waste

The total radioactivity of waste accepted for disposal or long term storage over 40 years of operation of the site, taking into account the radioactive decay, at the end of 2008 is around 5.5×10^{14} Bq and total volume about 840 m^3. The amount of radioactive waste accepted per year varies from one year to another, fluctuating about 10^{13} Bq. The volume of radioactive waste varies accordingly.

The annual accepted radioactive waste volumes and their activities are illustrated in Table 1

Table 1

Annual amount of radioactive waste accepted by BAPA

Year	Volume, m^3	Activity, Bq
2000	16	3.5E+12
2001	16	4.8E+12
2002	16	8.5E+13
2003	7	9.5E+12
2004	14	7.0E+13
2005	17	1.2E+12
2006	17	1.4E+13
2007	5	3.2E+13

Radioactivity for all radionuclides is given in Table 2 (data re-calculated on 1 January 2009).

Table 2

Radioactive waste inventory at Baldone site

Nuclide	Vault 1	Vault 2	Vault 3	Vault 4	Vault 5	Vault 6	Total
Ag-110m			6.00E+00			7.80E+01	**8.50E+01**
Al-26			1.05E+12				**1.05E+12**
Am-241			1.05E+11	3.01E+10		5.40E+11	**6.75E+11**
Ba-133	6.42E+08	2.83E+06	3.41E+11	3.70E+07		8.88E+08	**3.43E+11**
Bi-207			7.22E+07			1.79E+08	**2.51E+08**
Bi-210m			2.64E+08				**2.64E+08**
C-14	4.44E+11	1.87E+09	1.00E+12	2.81E+11	1.23E+08	1.02E+11	**1.83E+12**
Cd-109		4.03E+01	1.96E+06	7.61E+04		1.06E+07	**1.26E+07**
Cd-113m			6.93E+07				**6.93E+07**
Ce-144			1.24E+01				**1.24E+01**
Cl-36	1.01E+12		4.29E+12	1.22E+08	4.11E+07	2.45E+10	**5.33E+12**
Cm-244						5.59E+05	**5.59E+05**
Co-57			2.35E+02	1.57E+01	5.40E+00	6.01E+03	**6.25E+03**
Co-60	1.64E+11	7.86E+05	8.75E+11	8.86E+10	5.38E+07	6.80E+11	**1.81E+12**
Cs-134	2.97E+05		2.77E+08	6.63E+05	1.69E+05	8.35E+06	**2.87E+08**
Cs-137	2.53E+12	6.48E+04	5.34E+13	1.97E+12	2.71E+07	1.74E+13	**7.54E+13**
Eu-152	2.24E+08		4.98E+09			1.88E+10	**2.40E+10**

Eu-154	4.35E+07		2.80E+09				**2.84E+09**
Eu-155	7.89E+03						**7.89E+03**
Fe-55	1.53E+07		1.25E+10	2.62E+08	5.30E+05	1.41E+09	**1.42E+10**
H-3	3.68E+10	2.37E+08	1.43E+13	9.98E+09	1.72E+07	4.06E+12	**1.84E+13**
K-40	3.70E+10		8.81E+10				**1.25E+11**
Kr-85	1.84E+09		4.70E+10	1.20E+10		3.10E+10	**9.19E+10**
Mn-54			4.59E+03	7.14E+01	4.16E+01	2.21E+03	**6.90E+03**
Mo-93			1.84E+07			1.84E+07	**3.68E+07**
Na-22	1.89E+06		4.48E+09	5.31E+05	1.54E+05	7.83E+06	**4.48E+09**
Nd-144	9.96E+07					1.00E+08	**2.00E+08**
Ni-59			1.80E+09		4.11E+07		**1.84E+09**
Ni-63	1.68E+11		9.06E+12			3.63E+10	**9.26E+12**
Pb-210	4.82E+10		7.42E+11	1.71E+07	4.06E+07	7.63E+08	**7.91E+11**
Pd-107			5.55E+09			1.82E+09	**7.37E+09**
Pm-147	2.79E+07		3.83E+10	1.01E+09		1.36E+10	**5.29E+10**
Pu-238			6.14E+09	3.25E+10		2.41E+11	**2.80E+11**
Pu-239	1.85E+11		1.60E+12	8.87E+10	1.85E+09	1.02E+12	**2.89E+12**
Ra-226	8.59E+11	6.09E+09	7.75E+10	3.46E+04	3.67E+07	2.70E+11	**1.21E+12**
Ru-106			7.17E+04	6.85E+01		3.91E+03	**7.55E+04**
Sb-125	1.54E+07		6.92E+08			3.17E+06	**7.10E+08**
Sm-151			2.00E+08				**2.00E+08**
Sn-119m						2.02E+02	**2.06E+02**
Sn-121m			2.79E+07				**2.79E+07**
Sr-90	1.39E+12		2.47E+12	5.00E+11		1.31E+12	**5.67E+12**
Tc-99			1.10E+09	8.98E+07		3.20E+08	**1.51E+09**
Th-228				4.98E+01		1.04E+04	**1.05E+04**
Th-230			1.67E+04				**1.67E+04**
Th-232	4.24E+06	1.15E+08	9.39E+05			1.72E+08	**1.77E+08**
Ti-44			2.23E+09			1.18E+08	**2.35E+09**
Tl-204	5.57E+08		2.17E+09	1.04E+09		3.53E+10	**3.91E+10**
U-232	5.31E+10						**5.31E+10**
U-233			3.50E+04	3.84E+04		8.72E+05	**9.45E+05**
U-234			2.21E+03			2.15E+04	**2.38E+04**
U-235	6.07E+05		3.57E+04			4.27E+03	**6.47E+05**
U-238	8.22E+07	1.26E+08	2.17E+07	8.00E+06		2.70E+07	**1.39E+08**
Zn-65						1.25E+02	**1.25E+02**
Zr-93	1.78E+07		1.41E+09			2.22E+07	**1.45E+09**
Total	**6.94E+12**	**8.44E+09**	**8.96E+13**	**3.01E+12**	**2.23E+09**	**2.58E+13**	**1.25E+14**

(f) References to national laws, regulations, requirements, guides, etc.

Law – Act on Radiation Safety and Nuclear Safety, 2000, Vēstnesis 394/395 07.11.2000

1. The Cabinet regulations on Activities involving Ionising Radiation Sources, which do not require a Special Permit (Licence) or Permit, No.288 (03.07.2001);
2. The Cabinet Regulations on the Criteria in order to require a Special Permit (Licence) or Permit for Activities involving Ionising Radiation Sources, No.290 (03.07.2001);
3. The Cabinet Regulations on Minimal Insurance of the Civil Liability of Operator if is taken Activities involving Ionising Radiation Sources, No.294 (03.07.2001);

4. The Cabinet Regulations on the Procedure of Issuing of a Special Permit (Licence) or Permit for Activities Involving Ionising Radiation Sources and Procedure for Public Dispute on the Establishment of Ionising Radiation Facilities of State Significance or on Essential Modifications thereto, No.301 (03.07.2001);
5. The Cabinet Regulations on Protection against Ionising Radiation Transporting Radioactive Materials, No.307 (03.07.2001);
6. The Cabinet Regulations on the Procedure for Packaging and Marking of Ionising Radiation Sources, No.406 (18.09.2001);
7. The Cabinet Regulations on the Procedure for Control and Accounting of Exposure of Workers, No.454 (23.10.2001);
8. The Cabinet Regulations on Practices Involving Radioactive Waste and Related Materials, No.129 (19.03.2002);
9. The Cabinet Regulations on Protection against Ionising Radiation, No.149 (09.04.2002);
10. The Cabinet Regulation on Generic Principles for Exchange of Radioactive Waste, No.157 (16.04.2002);
11. The Cabinet Regulations on Radiometric Control of Goods and Transport Vehicles on the State Border, No.233 (05.04.2005);
12. The Cabinet Regulations on the Procedure governing Activities involving Nuclear Materials, Related Materials and Equipment, No.398 (22.04.2004).
13. The Cabinet Regulations on Physical Protection of Ionising Radiation Sources, No.508 (04.11.2002);
14. The Cabinet Regulations on Preparedness and Response in Cases of Radiation Accidents, No.152 (08.11.2003);
15. The Cabinet Regulations on Procedures for Building of Facilities Related to Radiation Safety, No.600 (13.07.2004);
16. The Regulations on Procedure on bulk purchase and realization of ferrous and non-ferrous metal cuttings and scrap, No.874 (22.11.2005).

(g) References to official national and international reports related to safety

JC:

1. First report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2003;
2. Second report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2005.

NSC:

1. Report on implementation of Convention on Nuclear Safety in the Republic of Latvia, 1998;
2. Second report submitted by Latvia under the Convention on Nuclear Safety, 2001;
3. Third report submitted by Latvia under the Nuclear Safety Convention, 2004;
4. Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2007.

EC:

1. Main Findings of the Commission's Article 35 Verification in Latvia, 21 to 24 March 2006, (LV-06/01);
2. Technical Report Verifications under the Terms of Article 35 of the EURATOM Treaty, (Latvian National Monitoring Network for Environmental Radioactivity), 2006, (LV-06/01).

IAEA:

1. Radioactive waste disposal and the environment in Latvia, Proceedings of Conference Radiation and Society: Comprehending Radiation Risk, Paris (France) 24-28 October 1994;

2. Multi-step Optimization for Salaspils Research Reactor Dismantling and Decommissioning, Proceedings of International Conference on Lessons Learned from Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities, Athens (Greece) 11-15 December 2006;

(h) References to reports on international review missions

1. IAEA End-of-Mission Report on "Waste Management Advisory Mission" by B. Martens, M. Ulbok, C. Bergman, 24-28 April, 1993;
2. Infrastructure Appraisal for Latvia on Radiation Safety, 04-08 December 2008 (RaSIA 18/2006/LAT.

(i) Other relevant material

Questionnaires:

1. Historical Survey of Nuclear Energy Activities in Latvia; 2003;
2. Pilot Study, Cross-Border Environmental Problems Emanating from Defence-Related Installations and Activities; Environmental Risk Assessment for Two Defence-Related Problems; „Defence-Related Radioactive Waste in Latvia. NATO/CCMS, Report No.227.

Annex 2

RESULTS FROM THE MONITORING PROGRAMME

This annex describes information about contamination of „Radons" site and surrounding area with radionuclides and evaluation of trends of spread of contamination, using existing monitoring network:

- Contamination of soil;
- Contamination of air (atmosphere);
- Contamination of shallow groundwater;
- Contamination of surface run-off water;
- Analysis of ionising radiation measurement results;
- Total contamination of the area (including air contamination);
- Need for recovery activities.

The current monitoring regime was established in 1995, following a review by the Ministry of Environment. The programme involves testing of samples of groundwater, surface water, air, soil and plants, to detect the presence of any radioactivity being released from the waste vaults, especially as signalled by increased gamma radiation levels. The current monitoring programme is described in a Work Procedure of the Radioactive Waste Management State Agency.

Contamination of soil and plant life

Soil

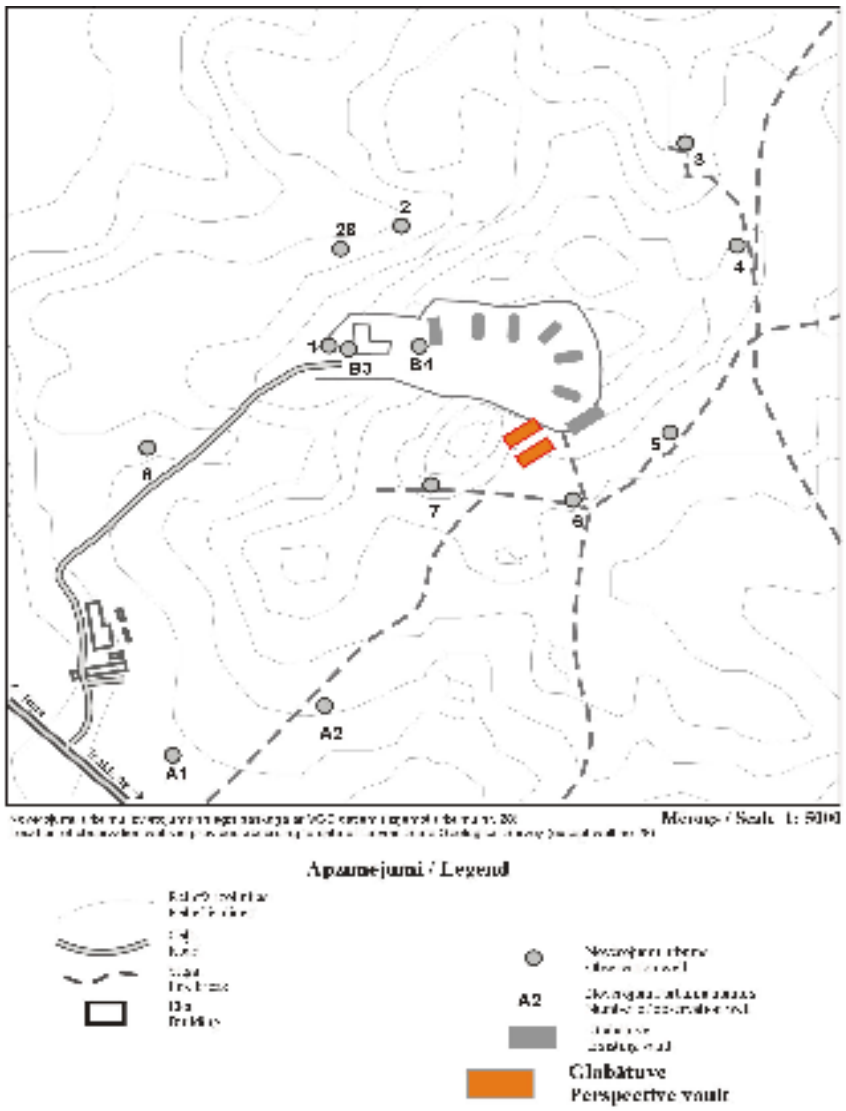
Independent from operator γ-spectrometric analyses from the soil samples, which were taken in "Radon", 300 m and 5 km away, showed concentrations of ^{137}Cs (3.8-14.8 Bq/kg) and ^{90}Sr (4.2-7.6 Bq/kg). The data from other points (Olaine, Valle, Mārupe – in Riga District) are rather similar: ^{137}Cs (9.6-11.2 Bq/kg) and ^{90}Sr (5.0-5.6 Bq/kg). From the comparison of these measurements one may conclude that no contamination due to the operations at „Radons" has been observed.

Plant Life

The results of plant samples taken in the vicinity of the site since 1995 indicated the presence of ^{137}Cs, such as observed in soil samples. The levels found in the samples (0.3-25 Bq/kg) have remained constant during the sampling period and correspond to the mean values for Latvia. This means that consumption of meat or other products of animals eating these plants as well as the direct consumption of these plants is radiological safe.

Contamination of shallow groundwater

For control of groundwater contamination, a network of monitoring wells has been established; comprising 12 wells in total (see Figure 2.1.). Wells A1, A2, B3 and B4 have been established during the 60th; the others were established in the 80th of last century.



2. att. Novērojumu urbumu izvietojums Baldones radioaktīvo atkritumu glabātuvē
Fig. 2. Locationof observation wells in Baldone radioactive waste deposit

γ- and β-activity in groundwater

Radioactivity measurements in groundwater beneath the site are on the average level characteristic for the country:

1) ^{232}Th 0.3-1.3 Bq/l;
2) ^{238}U 0.3-4.0 Bq/l;
3) ^{40}K 1- 83 Bq/l;
4) ^{137}Cs – 0.3-0.5 Bq/l.

Radioactivity in groundwater varies with e.g. soil characteristics and quantity and quality of precipitation and water flow patterns. ^{40}K is a naturally occurring radionuclide. ^{238}U and ^{232}Th also are naturally occurring radionuclides, but are also present in the waste.

From the comparison of concentrations in ground water near „Radons" and at other locations, it may be concluded that there is no evidence of leakage of ^{232}Th, ^{238}U and ^{137}Cs contamination from the „Radons". It should be mentioned that other man-made radionuclides, which are present in the vaults, such as ^{60}Co and ^{90}Sr are not found in the ground water.

Tritium in groundwater

Tritium has been measured in wells adjacent to the disposal vaults since 1996. Some recent data is given in Table 3, the detailed analyses had been performed in 2007, when sampling was done monthly. Its presence has also been found in wells further downstream, in zone A of the „Radons".

Table 3

Tritium concentration in monitoring wells

The date of sampling	No.B-3, Bq/l, (uncertainty, %)	No.B-4, Bq/l, (uncertainty, %)	No.6, Bq/l, (uncertainty, %)	No.7, Bq/l, (uncertainty, %)	No.8, Bq/l, (uncertainty, %)
01.2004	n/a[3]	9300 (13%)	n/a	n/a	n/a
03.2004	51 (13%)	12900 (6%)	12 (35%)	12 (45%)	17 (24%)
03.2005	15 (35%)	9760 (8%)	13 (35%)	7 (35%)	32 (18%)
06.2005	10 (35%)	7690 (8%)	11 (35%)	10 (35%)	13 (35%)
08.2005	14 (35%)	6905 (8%)	8 (35%)	8 (35%)	12 (35%)
11.2005	14 (35%)	6690 (8%)	11 (35%)	12 (35%)	12 (35%)
03.2006	6 (35%)	3967 (6%)	≤5	≤5	≤5
05.2006	≤5	4086 (6%)	8 (35%)	≤6	8 (44%)
07.2006	≤5	1740 (8%)	≤5	≤5	≤5
10.2006	7 (35%)	2171(6%)	8 (35%)	7 (35%)	15 (35%)
01.2007	n/a	1010 (6%)	n/a	n/a	n/a
02.2007	n/a	2480 (6%)	n/a	n/a	n/a
03.2007	6 (35%)	3770 (6%)	≤5	≤5	≤5
04.2007	n/a	5110 (6%)	n/a	n/a	n/a
05.2007	8 (35%)	6260 (6%)	8 (35%)	8 (35%)	9 (35%)
06.2007	n/a	6840 (6%)	n/a	n/a	n/a
07.2007	≤ 5	7520 (6%)	≤5	≤5	≤5
08.2007	n/a	8200 (6%)	n/a	n/a	n/a
09.2007	n/a	8630 (6%)	n/a	n/a	n/a
10.2007	7 (35%)	8960 (6%)	8 (35%)	7 (35%)	15 (35%)
11.2007	n/a	8150 (6%)	n/a	n/a	n/a
1.22007	n/a	7420 (6%)	n/a	n/a	n/a

The measured tritium levels are highest in well B-4, adjacent to vault 6, and have remained at a broadly constant level for several years, suggesting a steady rate of release from the waste. Tritium is also found in several other wells outside the B-zone, but at significantly lower levels. The tritium levels in the groundwater downstream of the waste vaults do not present a safety hazard (dose estimate from drinking pathway is 1.2 μSv). Options for reducing the levels further are under considerations and also new IAEA TC project is envisaged.

Trends of spreading of tritium contamination in groundwater

Presently, the main groundwater flow goes from vault 1, 2, 3, 7 and future vault 8 to direction WNW and is monitored in well 2. Here no significant contamination has been observed. The other main flow goes from vaults 4, 5 and 6 to direction SSW and is monitored in well 1 and

[3] n/a – data is not available either „no sampling" or „no water in the well"

partially in well 8. Here, as expected from the large tritium concentrations in well B-4 (vault 6), contaminations are enhanced.