Republic of Latvia

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

8th Review Meeting of the Contracting Parties

Radiation Safety Centre of the State Environmental Service
August 2024

CONTENT

Section A
Introduction

Decision about accession of the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereinafter - the Convention) was made by the Government on 2 February 2000[1]. Latvia acceded to the Convention 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 the eight Review Meeting of the Convention which is planned at International Atomic Energy Agency ((hereinafter – IAEA) in March 2025. This report demonstrates how 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 cooperation.

Based on legal requirements and outcomes from the previous 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 8th National Report,
- made it accessible for other Contracting Parties by posting the National Report on the Convention 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 Convention web site,
- will actively participate in Review Meeting.

The National report has been prepared by the Radiation Safety Centre of the State Environmental Service in cooperation with the Ministry of Climate and Energy and State limited liability company „Latvian Environment, Geology and Meteorology 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 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 Convention, 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 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.4). Report is a comprehensive compilation and has been updated on the basis of past reports. It

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

contains changes and new developments since the last report.

This report is available online at State Environmental Service website www.vvd.gov.lv.

Framework of supervision and implementation

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

1. Ministry of Climate and Energy – policy maker (elaborate, organize and coordinate issues related to radiation and nuclear safety) from 1st July 2024.

   Since 01.07.2024. the Ministry of Environmental Protection and Regional Development has been reorganized and functions related to environmental protection, including radiation safety and nuclear safety issues have been transferred to the Ministry of Climate and Energy.

2. Radiation Safety Centre of State Environmental Service (hereinafter - RSC) - the national regulatory authority,

3. Main operator State limited liability Company "Latvian Environment, Geology and Meteorology Centre" (hereinafter - LEGMC) - the radioactive waste management operator with their direct sub-unit radioactive waste repository "RADONS" at Baldone site (hereinafter – repository RADONS).

RSC is central structural unit of State Environmental Service, which according to the Law on Radiation Safety and Nuclear Safety has licensing, supervising and controlling functions, and it also maintains relevant databases in radiation safety and nuclear safety field.

The LEGMC is the operator of the repository RADONS at Baldone site and Salaspils Research Reactor (under decommissioning). In addition, LEGMC provides technical services of environmental monitoring, dosimetry service and management of radioactive waste.

Major developments since the previous national report:

- Long term commitment to radiation safety has been included in Environmental Policy Strategy for 2021-2027 (approved on 31.08.2022.). All radiation safety issues are included in Annex 3 "Radiation Safety Programme", also Radioactive waste management strategy and programme. Long term key performance indicators up until year 2070 have been developed, prognosis for radioactive waste streams and amount of waste up until year 2040 are included.
- In 2022 RSC organised public awareness campaign about historical consumer products. Goal of campaign was to educate public about radiation and to provide opportunity for members of public to transfer historical radioactive objects to safe management free of charge. During campaign more than 300 historical consumer products and other radioactive items were collected. More information about this campaign is available in Article 12 of report.
- In 2023, the construction project was developed for the planned objects in repository RADONS (*new radioactive waste vault, long-term storage facility for intermediate level waste and the final capping of the closed radioactive waste vaults*) and it was accepted by the RSC.
- In 2023 construction permit for decommissioning and dismantling of Salaspils Research Reactor was issued by RSC (allowed to start drawing up a building design). In 2024 the building design (also plan of decommissioning and dismantling) is in progress.
- In October 2024 Latvia has invited Integrated Regulatory Review Service (IRRS) follow-up mission to assess the progress and implementation of recommendations and suggestions, in preparation for mission RSC SES has carried out self-assessment of

implemented recommendations and suggestions. In 2019 Latvia hosted two international peer reviews to assess radiation safety infrastructure and, in particular, the radioactive waste management system (IRRS mission and Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) mission).[2]

[2] IRRS: http://www.vvd.gov.lv/public/fs/CKFinderJava/files/RDC/Zi%C5%86ojumi/IRRS%20Report%20.pdf
ARTEMIS:
http://www.vvd.gov.lv/public/fs/CKFinderJava/files/RDC/Zi%C5%86ojumi/ARTEMIS%20Report.pdf

Section B
Policies and practices

There are no changes in national policy regarding the use of nuclear power in energy sector. Latvia has no nuclear power plants and there is no intention to build such plant in Latvia. However, the National Energy and Climate Plan 2021-2030 requires the Ministry of Climate and Energy to carry out a study on the possibilities of using nuclear energy in Latvia. Conducting this study is essential for sound long-term strategic decision-making on energy sector development issues, including taking into account cardinal opposing views on the use of this technology.

Latvia recognizes:

- that the operation of nuclear research reactor has generated spent fuel and radioactive waste as well as other applications of nuclear technologies also generate radioactive waste. Moreover, the decommissioning of research reactor will generate much larger amount of radioactive waste than during its operational period;
- that the main objectives for any government in the given field are to ensure safe management of spent fuel and radioactive waste;
- the importance to the international community of ensuring that good 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 non-compliance of radiation safety 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.

Latvia recognizes the importance to develop national strategy and long-term plans for radioactive waste management. Currently Latvia has concept regarding low level waste (LLW) disposed in repository RADONS, intermediate level waste (ILW) is stored (long-term storage) in repository RADONS.

New Environmental Policy Strategy 2021-2027 has been approved by Cabinet of Ministers on 31 August 2022. Radiation Safety Programme is included in Environmental Policy Strategy 2021-2027 and also contains information about radioactive waste management – Radioactive waste management programme. Programme has been developed based on principles arising from Latvian legal acts and international documents including Convention and Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. Management of radioactive waste and also future plans (including long-term plans) is covered by the programme.

Waste classification is directly related to country’s waste management infrastructure.

Classification is used in context with national waste management capabilities with priorities in waste disposal and safe long-term storage. Existing categorization covers the main waste management activities in country: clearance, decay storage, long-term storage and final disposal.

Radioactive waste classification used in practice is based on IAEA General Safety Guide No. GSG-1 principles. Radioactive waste disposed of and stored at repository RADONS according to Guide GSG-1 classification corresponds to Low level waste (LLW) and Intermediate level waste (ILW).

LLW is categorised according to near surface repository waste acceptance limitation. In a near-surface repository, the following shall be disposed of (LLW according to Guide GSG-1 classification):

1) radioactive waste which does not contain isotopes with a half-life longer than 30 years;
2) radioactive waste, the total radioactivity of which is smaller than the values specified in Annex 3 to the Cabinet Regulations “Requirements for Operations with Radioactive Waste and Materials Related Thereto” No.129 (19.03.2002).

At the same time, existing national waste classification is not a direct reflection of Guides GSG-1 classification. The VLLW class is not considered in legislation for practical reasons. As VLLW volume is small, it has been found to be reasonable not create a new disposal facility dedicated for VLLW. Therefore VLLW and LLW are disposed together (no difference in treatment). Taking into account the rather small total amount of waste from decommissioning, it is decided to dispose of all waste above clearance level in near surface disposal vaults or place in long-term storage accordingly.

Previous radioactive waste classification was used in Latvia until 2014 with the following radioactive waste classes: Short Lived Low and Intermediate Level Waste (LILW-SL) and Long lived Low and Intermediate Level Waste (LILW-LL). From 2015, radioactive waste classification was done according to IAEA Guide GSG-1.

Section C
Scope of application

Latvia has no nuclear fuel or spent nuclear fuel and therefore has no intention to use reprocessing services, the spent nuclear fuel defined as the radioactive waste. This issue is incorporated also in the framework law that spent nuclear fuel may be processed as an eligible resource or intended for complete disposal without the further use thereof and treated as radioactive waste. The use of spent nuclear fuel shall not be permissible in the Republic of Latvia. Importation of spent nuclear fuel into the Republic of Latvia from other countries shall not be permissible.

There are no any large scale facility or processes in which natural occurring radioactive materials are processed and are treated as radioactive waste. There were occasional incidents when the orphan sources (for example, smoke detectors) or some consumer products with radium Ra-226 were found and treated as radioactive waste.

Latvia has no 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 repository RADONS has 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)).

Section D
Inventories and lists

In Latvia, there are no nuclear power plants as well as spent fuel management facilities. The only two facilities for which Article 32 of the Joint Convention are applicable:

1) radioactive waste near-surface repository RADONS

The national repository RADONS is designed for disposal of low-level waste. The total radioactivity of waste accepted for disposal or long-term storage (low level and intermediate level waste) at the end of 2023 is around 2,36 x 10^{14} Bq and total volume about 893 m^3. Detailed inventory lists of amount of radioactive waste are given in the Annex B. Currently the expansion of repository RADONS is in process (see Section K).

2) the shut-down Salaspils Research Reactor.

The shut-down Salaspils Research Reactor is located at Salaspils, 25 km from Riga. It was designed and constructed by the Soviet Union as a derivative of the IRT-1000 reactor (pool-type light water reactor) originally built at the Moscow Kurchatov Institute in the late 1950's. Salaspils Research Reactor was put into operation in 1961. In 1979 the secondary cooling system was reconstructed and the thermal power increased to 5 MW. After modifications, the reactor fuel had an enrichment of 90% ^{235}U, which motivated strict security measures. Salaspils Research Reactor was shut down in June 1998. The spent fuel has been transfered out of Latvia and returned to the supplier – Russia Federation in 2008. The fresh fuel had been transfered out of Latvia in 2005.

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

1) traditional areas, among them the most significant source of foreseen waste is industry: irradiation sources, nuclide gauges, calibration (Cs-137) and well logging sources (Am-Be);

2) specific areas:

- decommissioning of Salaspils Research Reactor - the foreseen total volume of radioactive waste has been assessed ~ 1200 m^3. In 2023-2024 decommissioning plan is under preparation and also radioactive waste volumes will be updated as a result.
- management of occasionally found orphan sources or contaminated materials.

On the whole there are about 974 operators under supervision and control of the RSC, among them only 28 operators generate radioactive waste (Table 1). There are no smoke detectors in use or storage at the authorized facilities anymore, last of them have been transferred to radioactive waste management repository in 2022.

Table 1

The use of radioactive sources by operators in various practice areas (01.01.2024)

Area of practice	Amount of operators using radioactive sources
Medicine	4
Industry	15
Baggage and cargo control	1
Research (including laboratories), calibration and service providers	8
Management of radioactive smoke detectors	0

Section E
Legislative and regulatory system

Article 18
Implementing measures

Obligations under the Convention have been implemented in national laws and 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).

Radiation Safety Programme is included in Environmental Policy Strategy 2021-2027. Radiation Safety Programme also covers issues related to radioactive waste management – radioactive waste management strategy and programme. The Environmental Policy Strategy 2021-2027 (adopted on 31.08.2022. with Cabinet Order No 583) is one of the most important political documents in environmental protection, including radiation safety and nuclear safety, and states the key events and benefits, as well as the result indicators (and long-term indicators) and the timeframe for reaching the results and also include a future action plan.

Management of radioactive waste and also future plans (including long-term plans) is covered by the Radiation Safety Programme. The Radiation Safety Programme takes into account the results of the ARTEMIS and IRRS missions of 2019, thus contributing to improving the radiation safety and nuclear safety in Latvia.

Radiation Safety Programme is developed based on principles arising from Latvian legal acts and international documents including Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, and Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. Information regarding management of radioactive waste and also future plans included in the programme. One of the planned activities is the construction of new vault and long-term storage facility for long lived waste in repository RADONS.

Article 19
Legislative and regulatory framework

There are three types of legal acts in Latvia: primary national legislation, secondary legislation (regulations) and EU legal acts:

1) The main law is the Law on Radiation Safety and Nuclear Safety. In parallel with this framework law, there is also a set of international agreements ratified or acceded by Latvia and several general legal acts, which have some provisions relevant to the Convention (e.g. building codes, administrative and criminal acts).

2) The secondary sources for Latvia's legal system are regulations and orders issued by the Government (Cabinet of Ministers).

Majority of applicable regulations are issued on the basis of the Law on Radiation Safety and Nuclear Safety, but some - based on other primary legal acts (e.g. the Cabinet Regulations on Procedures for Building of Facilities Related to Radiation Safety, No.661 (24.11.2015.) were issued based on Construction Law (09.07.2013.), but the Cabinet Regulations on State Environmental Service Statute, No.962 (23.11.2004) covering Radiation Safety Centre authority were issued based on State Administration Structure Law).

3) The main EU legal act is Euratom Treaty setting in force the legal provisions within

EU. Latvia has made all efforts to harmonize its national legislation with the legal provisions set in force within EU.

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 operators' civil liability insurance. Amendments to Law were approved by the Parliament 02.05.2024. to include all 10 safety fundamental principles. The main provisions for radioactive waste management are set in the Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002).

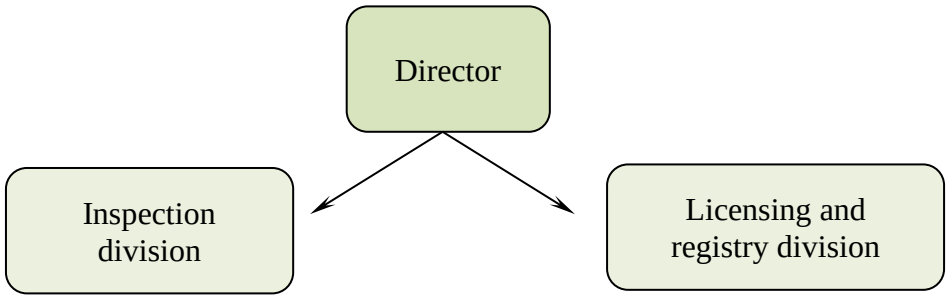
Operators must provide all necessary information to the RSC showing that safety measures are ensured. The RSC may at any time withdraw or revoke licenses if radiation protection and nuclear safety requirements are not met.

Article 20
Regulatory body

Radiation Safety Centre was established in July 2001 based on 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, because the system for radiation and nuclear safety was established already in 1994 based on the previous act with the same title) regulations, which were needed to implement legal requirements prescribed by this act.

According to amendments in framework law, adopted on June 12, 2009, changed its status to central structural unit of State Environmental Service which is under supervision of the Ministry of Climate and Energy. The RSC is the national regulatory authority in the field of radiation and nuclear safety. RSC has licensing, supervisory and control functions, maintains relevant databases. RSC carries out certification and recognition of radiation safety experts.

Organizational structure of the RSC:



In October 2019 internal structural changes of regulatory body RSC have been carried out, foreseeing specialization of several inspectors into emergency preparedness and response related areas.

Functions and duties are prescribed by the Law on Radiation Safety and Nuclear Safety. More detailed duties, rights and working procedures are defined in regulations approved by the Cabinet of Ministers. Main functions of the RSC related to implementation of the 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 activities and facilities using ionising 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 databases on practices, sources and workers.

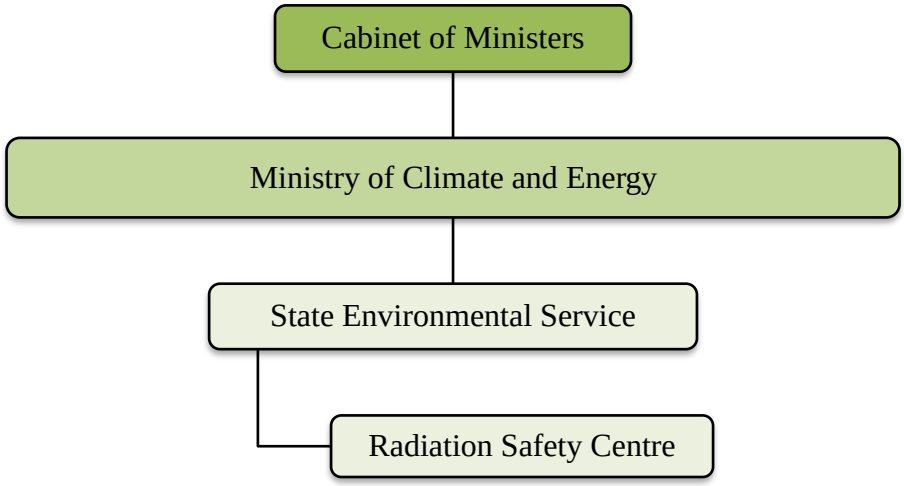
The law on state institutions in details prescribes system of supervision - in short, there is no rights for the supervisor directly affect decisions on the subject matters, only financial control and compliance with requirements from the Law on State civil servants. Thus, recommendations about independency are implemented.

A documented Quality Management System was developed in 2018 at RSC SES and supported by a set of procedures, checklists etc. and quality management system documents are regularly reviewed. According to the IRRS mission in 2019 the Quality Management System (QMS) has been documented and implemented and is being continually measured and assessed. Following recommendation from IRRS mission, in 2020 RSC developed human resources plan for 2021-2025, including assessment of human resources and time necessary for fulfilling RSC functions, as well as evaluation of existing knowledge of each staff member and required training in different areas.

The budget for RSC is granted annually by Saeima (the Parliament) as separate budget line under budget of State Environmental Service. The RSC does not have its own income since changes in its status in 2009.

The system of state authority under supervision of relevant ministry assures that RSC is an independent national authority and can implement RSC decisions independently from its supervisor.

Place of the regulatory body in the governmental structure:



Section F
Other general safety provisions

Article 21
Responsibility of the license holder

According to the Law on Radiation Safety and Nuclear Safety the license holder has prime responsibility for radioactive waste.

To obtain a license, the applicant must submit an application, which along with necessary documents, is reviewed by RSC. Before issuing a licence for such activities, that may result in creation of radioactive waste, the RSC shall request information from the operator regarding the foreseeable amount of radioactive waste and measures that will be taken to manage this radioactive waste.

A license is valid for ten years. However, any license may be subject to revocation if a violation of safety standards is detected during inspection. Upon expiration, the license is not automatically renewed, and a new application has to be submitted.

The operator whose activities with sources of ionising radiation generate radioactive waste shall be responsible for:

- safe radioactive waste management;
- the selection of such designing activities, operations and techniques of disposal which ensure that the volume of radioactive waste and radioactivity level are as low as practically possible;
- financial, technical and worker resources for safe operations with radioactive waste and materials related thereto;
- covering the radioactive waste management costs;
- keeping records of radioactive waste;
- covering the costs of transfer of radioactive waste to the disposal site.

LEGMC is the only organisation in Latvia, which is dealing with management of radioactive waste. LEGMC also is the license holder (research reactor) for the relevant activities subject to the Convention, in particularly for ensuring safe maintenance of relevant equipment of the nuclear reactor as well as for a complete cycle of radioactive waste management.

Article 22
Human and financial resources

Adequate provision of financial and human resources is a prerequisite in ensuring safe management of radioactive waste and achieving improvements in radiation safety culture. According to the Law on Radiation Safety and Nuclear Safety and Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002), operating facility is required to allocate adequate financial and human resources and to ensure relevant training of the personnel.

LEGMC which is responsible for safe management of repository RADONS and Salaspils Research Reactor is mainly financed from the State Budget. The Ministry of Climate and Energy justifies adequate funding for each fiscal year and long term programmes to the Government. The Ministry of Climate and Energy provides also extra funds from its resources

(including extra-budgetary resources from Latvian Environmental Protection Fund). Government has approved that decommissioning of research reactor and for implementation of the Concept of Radioactive Waste Management will be financed from the State budget.

To strengthen capacity on various radiation safety issues, in cooperation with IAEA Country Programme Framework of Republic of Latvia for 2020-2025 was approved in December 2019 outlining a six-year strategy in four priority areas of radiation safety and regulatory infrastructure; nuclear knowledge development and management; human health and waste management and environmental monitoring. According to the Country Programme Framework in 2022-2023, RSC implements the national IAEA project LAT9016 "Strengthening the regulatory framework for radiological emergencies and radioactive waste management" for improving knowledge on radioactive waste management and emergency. In 2023 Latvia hosted IAEA expert mission on radioactive waste management and in 2022 expert mission on transport of radioactive material and emergency preparedness. Within the framework of these experts' missions, the implementation of IRRS recommendations and issues of improving legislation were discussed with the international experts.

Article 23
Quality assurance

Development of quality assurance programme is required by the Cabinet Regulation No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (28.01.2021) and by the Cabinet Regulation No.149 "Protection against Ionising Radiation" (09.04.2002).

Any facility (especially facilities of state significance) is required to have a quality assurance programme.

The quality assurance programme is one of the main documents for operations with sources of ionising radiation. Accordingly, one of the main tasks for inspectors of RSC is to control the implementation of quality assurance programs.

Additional requirements for quality assurance programmes are described in Regulations on Radiation Protection during the Transport of Radioactive Materials (including radioactive waste) as well.

LEGMC has implemented a quality assurance system, which complies with all aforementioned requirements, and accordingly RSC has issued the licence for activities with ionising radiation sources:

• Quality assurance programme for Salaspils Research Reactor was updated on 11.05.2022.

• Quality assurance programme for repository RADONS was updated on 15.10.2022.

LEGMC has prepared several instructions covering a range of issues: general radiation safety, transportation, decontamination, waste acceptance, waste pretreatment, waste inventory in 2019-2022.

Licence of LEGMC includes also activities of two laboratories. An accreditation has been granted by Latvian National Accreditation Bureau (LATAK) for certain laboratory activities under ISO 17025 standard.

RSC has developed several guidelines for operators to facilitate the licensing (authorization) process as well as to ensure consistent improvement of radiation safety culture. These guidelines about the authorization process, about carrying out workplace monitoring and preparing assessment of radiation safety (assessment is prepared by radiation safety and nuclear

safety experts) are published on State Environmental Service website. In 2019-2023 several guidelines have been updated, for example, on development and on the content of radiation safety quality assurance programmes and guidelines on content of licensing documents, including on specific documents required for radioactive waste management. In 2021-2024 additional guidelines have been developed, for example, on safe transport of radioactive materials, safe use of industrial radiography x-ray devices, site release from regulatory control.

To increase level of radiation safety culture in 2018 and 2019 RSC has developed self-control tools for different types of operators, including self-control tools for waste management operators and radioactive material transport operators. Checklists analogous to the self-control tools are used in inspections by RSC inspectors. These self-control tools are regularly reviewed, considering the experience gained, also in the international events.

To assess the baseline for measuring the level of knowledge and availability of information about radiation safety, in 2021 RSC carried out a public survey for three groups of respondents – operators, the public and the responsible institutions involved in radiation safety. The survey for operators is repeated in 2024 in order to compare results. Results of survey are available on SES website https://www.vvd.gov.lv/lv/informativie-materiali#valsts-vides-dienesta-2021gada-sabiedriskas-domas-aptauja-par-zinasanam-un-informacijas-pieejamibu-radiacijas-drosibas-joma.

In addition to ensure consistency in decision making process and to ensure application of radiation safety culture in the regulatory authority, RSC has updated and developed management system procedures for licensing (authorization) and inspection processes, updated Quality Management System Manual in 2024, also to include procedure for exchange of information and lessons learned (including receiving and disseminating lessons learned from both regulatory experience and operational experience); updated Human Resources Plan in 2023 to include Programme for Promotion of Radiation Safety Culture and Leadership.

State fees for issuing licences and registrations are prescribed in the Law on Radiation Safety and Nuclear Safety and Cabinet Regulation No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (28.01.2021). State fees are sent to State Treasury.

Article 24
Operational radiation protection

Operator is responsible for radioactive waste and before starting practices operator estimates the expected amount of radioactive waste and the measures that will be taken to manage this radioactive waste, operator develops quality assurance programme and emergency preparedness and response plan, and describes the measures to be taken to control the discharges and unplanned/uncontrolled releases. During the operating lifetime operator is responsible for implementation of safety requirements.

Discharges are specified and quantitatively limited by Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002).

Environmental situation is controlled in accordance with the programs for national monitoring and also by operator. The National Environmental Monitoring Programme is included in the Environmental Policy Strategy 2021-2027.

Results of environmental monitoring for repository RADONS and Salaspils Research

Reactor are available on LEGMC website.[3] One of early warning continuously operating monitoring station's is located directly on site of repository RADONS, and another in nearby town Baldone. RSC is responsible for these stations, which are part of the network of stationary monitoring stations. The following measures are annually performed according to monitoring programme by operator (LEGMC): gamma radiation dose rate control in dry monitoring well, in the control zone and in supervision zone and above vaults; groundwater radioactive contamination in samples of monitoring wells; surface water contamination; radioactive contamination of precipitation the control zone; radioactive contamination of soil in control zone and supervision zone; radioactive contamination of vegetation samples in supervision zone; air radioactive contamination in control zone monthly.

The requirements for national radiation monitoring under environmental monitoring program were introduced also to fulfil Article 35 of the European Atomic Energy Community (Euratom) Treaty. The last European Commission's Article 35 Verification was carried in 2022. The recommendations and suggestions are included in the final technical report.

LEGMC provides decay storage for radioactive waste form hospital and RSC regularly receives reports about the free release of exempted materials from LEGMC.

Additional dose limits related to radioactive waste management are specified in Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002). If, based on the results of environmental monitoring, 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 Cabinet Regulations "Protection against Ionising Radiation" No.149 (09.04.2002) set the permissible amounts of radionuclides that may be annually discharged in the environment. If these regulations do not specify radionuclide dispersal amounts for any of the radionuclides, according to the Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002) the maximal exposure dose to the critical group of population shall not exceed 100 μSv/year, but maximal average dose - 10 μSv/year. These values shall be used in calculating the dispersal limits for one solid unusable material portion or one day.

There has been no case were radiation workers of LEGMC 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 correspond to good practices.

Article 25
Emergency preparedness

The Cabinet Regulations on Requirements for Preparedness for Radiological Emergency and Actions in the Event of Such Emergency, No.152 (08.11.2003) prescribe main duties for emergency preparedness (including training). For any nuclear facility,

[3] https://videscentrs.lvgmc.lv/lapas/salaspils-kodolreaktors#61997905

radioactive waste management facility and another significant object emergency preparedness plan shall be prepared and tested before it commences operation agreed by the RSC. The plans shall be agreed also with local municipalities and Fire-Fighting and Rescue Service. These are preconditions for applicants and the relevant documents are assessed before RSC grants the license. RSC developed new regulations on emergency preparedness and response in 2023 and submitted to the ministry to be further coordinated with the relevant ministries and submitted to the Cabinet of Ministers for approval.

LEGMC (as operator) has implemented two local plans, in agreement with relevant local municipalities and Fire and Rescue Services:

- Updated emergency preparedness and response plan for Salaspils Research Reactor has been approved by RSC on 16.02.2024.
- Updated emergency preparedness and response plan for repository RADONS has been approved by RSC on 04.06.2021.

On 5 May 2016 Civil Defence and Catastrophic Management Law was adopted. According to this Law, new State Civil Protection Plan was issued in 2020. The State Civil Protection Plan provides basic principles for emergency preparedness according to radiation and nuclear safety legislation and has requirements for regular testing (including theoretical exercises, table top exercises and practical exercises) and updating of the Plan. Changes in Civil Protection Plan have led to necessity for State institutions to review and refresh emergency preparedness.

The Ministry of Climate and Energy is national coordinating authority in case of radiological emergency (regional or national emergencies). The main bodies` in the case of an emergency are:

- RSC - national warning point for radiation emergencies, which is operational 24/7. In case of emergency RSC evaluates available information and provides recommendations for other involved organizations,
- State Fire-fighting and Rescue Service - performs on site actions assigned by State Civil Protection Plan in case of radiological and nuclear events, performs decontamination of persons and means of transport,
- LEGMC - coordinates and organizes environmental radiation monitoring, provides meteorological information and is responsible for radioactive waste management, performs decontamination of buildings, soil, ensures emergency services with dosimeters.

Other requirements for the emergency planning and response are set out also in other regulations e.g. on protection against ionising radiation, on safe transport, on licensing etc.

In March 2020 RSC established an Inter-institutional Emergency Preparedness and Response Working Group (includes representatives from 20 institutions) to improve cooperation between all the responsible institutions. The working group aims to identify available and required resources necessary to implement emergency measures across all responsible institutions, to assess their capacity and ultimately draft readily available plans and algorithms for joint action and cooperation between institutions in case of a nuclear and radiological emergency.

During 2021-2022 as part of the Inter-institutional Emergency Preparedness and Response Working Group algorithms of action in radiological and nuclear emergencies were developed (approved at the meeting of the Cabinet of Ministers on 02.11.2022.). Algorithms were developed to ensure inter-institutional cooperation in line with State Civil Protection Plan.

In addition, to assess preparedness of different involved institutions for radiation emergency situations, RSC since 2020 within the framework of the working group has been conducting annual survey to collect latest information on the resources available and required by the institutions for radiation emergency situations (in future it is foreseen that the survey will be held once per three years). According to this survey RSC developed the Resource Summary that shows key topics that were covered in the survey and presented to the institutions which are included in the working group.

The current early warning radiation monitoring system was established in 2014. Currently 24 stations are operational throughout the territory of Latvia. There are 20 stationary spectrometric monitoring stations, one portable spectrometric station, one aerosol monitoring station and two water monitoring stations. Continuous measuring mode provides information about gamma dose rate in the environment. One of spectrometric monitoring station is in repository RADONS, another – Salaspils Research Reactor. In 2024-2025, the system of radiation monitoring stations will be modernized by replacing the existing detectors with newer ones and installing an additional new monitoring station. Modernization of the system will be carried out using funding from European Union funds.

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. Since 2001 RSC participates in EURDEP (European Radiological Data Exchange Platform), which is both a standard data format and a network for the exchange of environmental radiation monitoring data between European countries in real-time. RSC made available the national radiological monitoring data for Joint Research Centre (JRC) Ispra and has access to the data of all other participating countries. In parallel with EURDEP RSC participates in ECURIE program, which is a 24h emergency notification and information exchange system.

To ensure readiness and reaction capabilities for incidents, RSC participates in IAEA communication exercises and RSC regularly organizes practical internal exercises (orphan source search, use of equipment). During last three years RSC has regularly organized practical exercises on actions in case of accidents. In 2022 three institutions participated in the exercises, but in 2023 in the practical radiation emergency exercise in the territory of the Daugavpils regional hospital already 7 institutions participated – first responders, other institutions that are involved in radiation emergencies and personnel of the hospital. In 2024 RSC in cooperation with International Airport "Riga" is planning to organize practical exercise on response in radiation emergency for all institutions located in the airport as well as the state institutions that are involved in radiation emergency response.

At the end of the 2022 RSC participated in National level civil protection exercises “RADEX” - a table-top exercise, scenario included verifying cooperation of involved institutions, as well as responsibilities and duties during radiological and nuclear emergencies (20 institutions participated).

RSC regularly participates in exercises organized by other institutions (for example LEGMC, State Border Guard). And at the same time RSC invites other institutions to organize more exercises and trainings to strengthen capacity and response.

As mentioned before (Article 23) in 2019 internal structural changes of RSC have been carried out, foreseeing specialization of several inspectors into emergency preparedness and response related areas. Therefore, building knowledge of RSC staff related to responsibilities in emergency management is necessary.

Article 26
Decommissioning

LEGMC is responsible for decommissioning of the Salaspils Research Reactor. Decommissioning of the reactor is an ongoing process according to the Cabinet resolution from October 1999, which was slightly modified in 2004. Environmental Impact Assessments for decommissioning and expansion of radioactive waste repository RADONS 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 environmental impact assessment final report).

LEGMC has a licence for safe management of Salaspils Research Reactor. According to the Cabinet Regulations on Procedures for Building of Facilities Related to Radiation Safety, No.661 (24.11.2015) RSC issues the construction permit instead of the Construction Board. In other cases (unrelated to radiation facilities) construction permit is issued by Construction Board of the relevant local government (municipality). However, for radiation facilities RSC is the responsible authority for issuing construction permit, while supervision of decommissioning (according to construction permit) is carried out by State Construction Control Bureau of Latvia.

IRRS mission in 2019 findings also included provisions for safe planning and conduct of decommissioning (identifying decommissioning strategy, periodical update of decommissioning plans). This recommendation was addressed in new Cabinet Regulations No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (adopted 28 January 2021).

Decommissioning and dismantling of the Salaspils Research Reactor is important planned activity included in Radioactive Safety Programme. According to Radioactive Safety Programme it is planned that decommissioning of reactor could be executed by 2026-2030, depending on all linked activities.

As it was reported previously, work on decommissioning of Salaspils Research Reactor continued, and on 20.05.2020. an open tender was announced for preparation of decommissioning and dismantling plan for Salaspils Research Reactor. A contract concluded on 28.04.2021. "Radiological characterization of Salaspils Research Reactor, development of building design for decommissioning and dismantling of Salaspils Research Reactor and author supervision". Project aim is to elaborate building design and final decommissioning and dismantling plan for Salaspils Research Reactor as well as to provide a cost estimation of decommissioning. The following was done during implementation of the project:

- In 2021 a lot of work was done related to study of available operational and historical documentation and data of previous investigations. Preparation of radiological survey program, geometric survey of site and scanning of premises for preparation of 3D model of reactor building, rooms and systems.

- In 2022 finalized radiological survey program, work programme for field radiological measurements and a radiological survey done according to program, prepared report on radiological field measurements. Prepared and approved construction design task. Submitted the first revision of decommissioning plan.

- In 2023 construction permit was issued by RSC (allowed to start drawing up a building design).

• In 2023 surface smear test sampling done according to field measurements, water sampling, boring and sampling of biological shielding. Laboratory measurements of the collected smears, solid material and water samples were carried out.

It is planned that the building design for decommissioning of Salaspils Research Reactor (also decommissioning and dismantling plan), will be completed in 2024-2025. Final decommissioning tender will be announced after implementation of building design project.

According to previous estimation during the decommissioning of Salaspils Research Reactor, approximately 1200 m^3 of radioactive waste will be generated, which meets the conditions for disposal, as well as 8 m^3 of intermediate level waste (ILW), which will be accepted for long-term storage in repository RADONS. Low level waste will be disposed at repository RADONS. Radioactive waste amounts from decommissioning will be updated in Salaspils Research Reactor final decommissioning plan.

To provide necessary capacity for decommissioning waste stream from Salaspils Research Reactor, a project was implemented for repository RADONS. More information about this project is in Article 14 of report.

Section G
Safety of spent fuel management

Article 4
General safety requirements

Since May 2004 several legal documents had been adopted (e.g. EU regulations implemented into 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 regarding spent nuclear fuel.

Article 5
Existing facilities

There are no major changes regarding the existing facilities and there is no nuclear and spent fuel. Latvia had a pool type 5 MW IRT research reactor at Salaspils. 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 LEGMC manages the decommissioning project of this research reactor.

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 Cabinet Regulation No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (adopted 28 January 2021), The Law on Environmental Impact Assessment and other 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 Convention and Nuclear Safety Convention is governed by Convention on environmental impact assessment in a transboundary context (so called Espoo Convention).

Article 7
Design and construction of facilities

As there is no government plan to build any nuclear facility therefore there is no safety issues related to the spent fuel. Nevertheless, 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, Basic safety regulations and Licensing Regulations. Special construction regulations have been implemented for construction of sources of ionising radiation of national level, with requirements for obtaining

a building permit, building design, and construction work.[4]

Article 8
Assessment of safety of facilities

As there is no government plan to build any nuclear facility therefore there is no safety issues related to the spent fuel. Nevertheless, 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.

Article 9
Operation of facilities

As there is no government plan to build any nuclear facility therefore there is no safety issues related to the spent fuel. Nevertheless, RSC regularly provides inspections to verify compliance with legal requirements - according the Law on Radiation Safety and Nuclear Safety any nuclear facility is "ionising radiation facility of state significance", thus according the roles of procedure for RSC the regular 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 planned by the operator.

Article 10
Disposal of spent fuel

The spent nuclear fuel has been moved out of Latvia in 2008 in accordance with internationally agreed practice - return to the supplier and there is no spent fuel in territory of Latvia.

[4] The Cabinet Regulations on Procedures for Building of Facilities Related to Radiation Safety, No.661 (adopted on 24.11.2015.) (*based on Construction Law*)

Section H
Safety of radioactive waste management

Article 11
General safety requirements

The following legal acts directly governing radioactive waste management are:

- The Law on Radiation Safety and Nuclear Safety sets general safety provisions for ensuring that all radioactive waste (including sealed sources) is adequately processed, stored or disposed of under regulatory control;
- Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002);
- Cabinet Regulations No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (28.01.2021) - set requirements for the licensing process (incl. activities with radioactive waste). Before issuing a licence for practices which may result in generation of radioactive waste, the RSC requests information about the projected quantity of radioactive waste and measures to be taken by the operator in relation to such waste
- The Principles of Determination of the Equivalence of Various Radioactive Waste.

Basic safety requirements, requirements for physical protection, safe transport, worker exposure, etc. are applicable also to radioactive waste management.

A Concept of the management of radioactive waste (approved by the Cabinet of Ministers in 2003) was elaborated, based on:

- IAEA generic principles for radioactive waste management,
- Site-specific conclusions recommendations of CASSIOPEE study on Safety Assessment of repository RADONS.

According to the Law on Radiation safety and Nuclear Safety and Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002) the radioactive waste is classified in several groups, *inter alia*, also according the amount of generated heat power for high activity waste. Information about categories of radioactive waste in repository RADONS is included in Annex B.

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, but such situations are very few.

According to the Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002) the operator who plans to import a sealed source which contains radioactive materials with such total radioactivity that after the use of these ionising radiation sources for 10 years it will exceed 100 MBq, before acquiring thereof in the ownership or possession shall take measures to conclude a contract about returning disused source to its manufacturer on the terms as follows:

1) the maximum time limit during which the disused source may be returned to its supplier shall be 15 years after concluding the contract,

2) the supplier shall undertake to accept back a spent ionising radiation source after the end of the safe usage period thereof within a year after receipt of a written request by the ionising radiation source user.

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:

1) other possible suppliers must be sought or;

2) requirement to pay a tax for import of radioactive substances into Latvia is enforced.

Latvia has developed Radiation Safety Programme, including issues related to strategy and programme of radioactive waste management, according to EU directive and IAEA requirements. The Programme (also radioactive waste management programme) is included in Environmental Policy Strategy 2021-2027. Long term goals for safe management of all classes of existing and future radioactive waste streams have been expressly included in Programme. Programme sets medium term goals and long-term goals **related radioactive waste management**:

- **Medium term goals**:

a) safe maintenance and environmental monitoring of the Salaspils Research Reactor and repository RADONS;

b) long-term safety assessment of repository RADONS. The next long-term safety assessment is planned for 2026;

c) upgrade of repository RADONS:

1) construction of new vault for disposal of radioactive waste in repository RADONS, Radioactive waste from decommissioning of the Salaspils research reactor will be placed in the new vault;

2) construction of long-term storage facility for intermediate level waste (ILW) in repository RADONS;

3) final capping of the closed radioactive waste vaults.

Information on progress with regard to upgrade of repository is provided in Article 14 of the report.

d) decommissioning of Salaspils Research Reactor. Information on progress with regard to decommissioning of reactor is provided in Article 26 of the report.

e) self-assessment and international assessment of radiation safety and nuclear safety infrastructure (IRRS follow-up mission, EPREV (Emergency Preparedness Review) mission);

f) promotion of radiation safety culture (informative materials, guidelines, educational seminars, regulatory requirements);

g) revision and updating of the regulatory framework in radioactive waste management in accordance with international requirements and guidelines. It is planned to start work on the revision of the Cabinet Regulations “Requirements for Operations with Radioactive Waste and Materials Related Thereto” No.129 (19.03.2002) in 2025.

h) promotion of public awareness of radioactive waste management (website, monitoring reports, preparation of information materials, meetings).

- **Long term goals:**
  a) regular international assessments of radiation safety infrastructure and radioactive waste management;
  b) long-term safety assessment of the repository RADONS;
  c) release of the territory of the Salaspils Research Reactor from regulatory control;
  d) decision making related to closing repository RADONS and build new repository in 2050-2070;
  e) if a decision is made to close the repository RADONS, construction of a new radioactive waste repository;
  f) solution for disposal of intermediate level waste. Latvia plans to carry out an in-depth analysis (expert assessment) of possible sustainable management options for intermediate level waste. Assessment has to be carried out until 2040. Then implementation of a solution for disposal of intermediate level waste will be until 2070. Also research internationally or in other countries is to be considered. Deep geological repository has been assessed not to be adequate for waste streams and amount in Latvia, also considering burden to future generations.

Article 12
Existing facilities and past practices

LEGMC 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. LEGMC maintains near surface radioactive waste repository RADONS in Baldone. More detailed information about the repository RADONS is provided in Annex B of the report.

LEGMC also maintains research reactor site in Salaspils and is dealing with safe enclosure of research reactor and decommissioning activities thereof. More detailed information about the decommissioning of Salaspils Research Reactor is provided in Article 26 of report.

In 2022 RSC SES organised first public awareness campaign about historical consumer products. Goal of this campaign was to educate public about radiation and to provide opportunity for members of public to transfer historical radioactive objects to safe management free of charge. Informative material for public was developed in 2021 regarding historical consumer products and other possible radioactive items[5]. More than 300 historical consumer products and other radioactive items were collected. Campaign activities included development of logo, website, youtube videos, press releases and social media posts in twitter and facebook, interviews in television, publications in printed media. Informative materials and descriptions about historical radioactive objects were prepared before campaign in order for public to be able to recognise such objects, as well as after campaign to characterise the collected objects. Additional information is available on SES website https://www.vvd.gov.lv/lv/radioaktivo-prieksmetu-nodosanas-kampana.

[5] https://www.vvd.gov.lv/lv/informativie-materiali#prieksmeti-un-plasa-paterina-preces-ar-paaugstinatu-radioaktivitati

Article 13
Siting of proposed facilities

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

- The Law on Radiation Safety and Nuclear safety stating that in accordance with the Law on Environmental Impact Assessment, an environmental impact assessment has been performed for the creation of an ionising radiation object of national significance or the performance of essential changes therein, a decision to accept activities shall be taken by the Cabinet by issuing an order for each time.
- Cabinet Regulation No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (28.01.2021) requiring to fulfil major steps to be made prior to authorization of the facility, and establishing the mechanism of public hearing;
- 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 facilities on the environment.
- Convention on environmental impact assessment in a transboundary context (so called Espoo Convention) requires cross border activities regarding siting issues.

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 Basic Safety Standards and Licensing Regulations must also be complied with.

Cabinet Regulations "Procedures for Building of Facilities Related to Radiation Safety" No.661 (24.11.2015., based on Construction Law) have been implemented for construction of sources of ionising radiation of national level, with requirements for obtaining a building permit, building design, and construction work. These regulations also apply to radioactive waste management facilities.

According to Environmental Policy Strategy 2021-2027 and Concept of Radioactive Waste Management it is planned to **upgrade repository RADONS** – to build new radioactive waste vault and long-term storage facility for intermediate level waste and realized the final capping of the closed radioactive waste vaults in repository RADONS. In April 2021 LEGMC signed contract for "Development and author supervision of the building design of a new radioactive waste vault, long-term storage facility and the final capping of the closed radioactive waste vaults in the radioactive waste repository "Radons"". Project was started in 2021 with developing of construction intention (building design in minimum composition) for new facilities (disposal vault and long-term storage facility) and final capping of the closed radioactive waste vaults. On 13.01.2022. construction permit was issued by RSC allowing to start drawing up a building design. On 14.11.2023. building design of upgrade repository RADONS was accepted by RSC and also estimated cost of construction was calculated.

After the Salaspils Research Reactor decommissioning building project is accepted (see Article 26), both projects - the Salaspils Research Reactor decommissioning project and the upgrade repository RADONS project with cost assessments will be submitted to the Cabinet of Ministers for a decision on their further implementation.

For issuing construction permit for a new vault and long-term storage facility and final capping of the closed radioactive waste vaults in repository RADONS RSC involved radiation safety expert and architect (*signed contracts for the involvement of specialists*), however, the final decision for issuing permit was made by RSC. These same specialists are also involved in the evaluation of the Salaspils Research Reactor decommissioning project.

Article 15
Assessment of safety of facilities

The Cabinet Regulations "Protection against Ionising Radiation" No.149 (09.04.2002) and Cabinet Regulation No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (28.01.2021) require, that in order to be authorized, the following tasks shall be carried out by applicant:

- reduce the risks to the health and safety of an employee or other person, related to the structure and use of a source of ionising radiation, taking into account the effect of the ionising radiation, electric shock and mechanical hazard;
- ensure the preparedness for radiological emergencies and the prevention of the consequences thereof;
- ensure the development of a quality assurance programme;
- ensure access to information concerning the evaluation of potential threat from facilities, as prescribed by the licensing regulations.

Information about planned activities and major changes at facilities should also be provided to the public. All this information used for RSC decisions regarding licensing, licensing conditions and implementation is also verified when inspections are carried out.

RSC inspectors carry out verification of safety on regular basis and perform announced and unannounced inspections. RSC developed the internal regulations "Conducting inspections" in 2020 which determines the procedures by which the RSC inspectors carry out supervision and control in the field of radiation safety. RSC procedure "Conducting inspections" (2021) specify and methodically describe the actions to be performed by inspectors, related to the performance of the inspection and actions after the inspection. If, during the inspection, a possible violation is detected, RSC inspectors take account the procedure "Methods of enforcement actions and the Principles for the Application Thereof" (2021), which includes information on the methods of enforcement actions and the initiation of the administrative violation process.

The administrative fines regulated by Chapter IX "Administrative Offences in the Field of Radiation Safety and Nuclear Safety and Competence in Administrative Offence Proceedings" of Law on Radiation Safety and Nuclear Safety[6].

Repository RADONS as well as Salaspils Research Reactor are annually inspected by RSC inspectors, different types of inspections are carried out – complex, thematic, follow-up inspections. Supervising of operators is supplemented by goal-oriented inspections (including IAEA and European Commission safeguards inspections, international missions aimed at physical protection modernization in both facilities). Other operators are inspected by RSC taking into account graded approach.

Moreover there is additional legal base for safety impact assessment, which is given in the Law on Environmental Impact Assessment. This system was extensively used during

[6] https://likumi.lv/ta/en/en/id/12484

the planning phase of decommissioning of Salaspils Research Reactor and activities for expansion of repository RADONS.

Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002) define responsibility of operators to perform long-term safety assessment for both types of facilities - the new facilities as well as already existing:

1) before establishment of radioactive waste facility;
2) before amendments in the licence related to essential changes in operation;
3) once in 10 years before submission of licence application for facility operation;
4) before closure of radioactive waste disposal facility.

By performing the long-term safety assessment, the operator takes into account all requirements of national legislation as well as IAEA recommendations related to safety assessment. Operator informs the society about safety assessment via their website, local newspaper, electronic report to RSC and local municipality.

Design options of new radioactive waste vault and new long-term storage facility and safety assessment of existing radioactive waste vaults were examined in the process of environmental impact assessment (completed in 2005). The last long-term safety assessment of repository RADONS was performed in 2016. The main objectives of the safety assessment were:

- To characterize and analyse location of repository RADONS;
- To analyse characteristics of disposed radioactive waste as well as radioactive waste kept for long term storage (incl. new vaults and long-term storage);
- To analyse design of existing vaults;
- To provide analysis of potential scenarios of spreading radioactive contamination;
- To elaborate proposals for decrease of ionizing radiation in case of exceeded levels stipulated by legislation.

Main conclusions from the report of long-term safety assessment of repository RADONS:

- Present technical and institutional status of repository RADONS ensures safe operation of the storage in accordance with the requirements of normative;
- Existing physical barriers of infrastructure are adequate to ensure long term radiological safety;
- Despite to potential migration capacity of tritium, taking into account existing and planned engineering solutions to be applied after closure of the storage, no significant risks of spread of tritium exist that might create risks for the environment and local inhabitants;
- After operational period of radioactive waste vaults it is necessary to provide complex of engineering for closure of vaults in accordance with requirements of normatives that shall result in construction of multi-layer closure top cover;
- In order to provide adequate monitoring regime for assessment of impact of radioactive waste storage to the environment it is necessary to carry out assessment of existing monitoring system.

The next long-term safety assessment of the repository RADONS is planned to be carried out in 2026.

In 2017 all groundwater monitoring wells at repository RADONS were renovated. In 2019 LEGMC conducted a survey of tritium migration and rainwater draining system of radioactive waste vault No.7 at repository RADONS. The survey concluded the necessity to extend groundwater monitoring network and to provide technical assessment of aboveground constructions of vault No.7. In 2021 a technical assessment of aboveground constructions of vault No.7 was prepared. It is planned to implement available recommendations in context with project of the design of new radioactive waste vault, long-term storage facility and the final capping of the closed radioactive waste vaults at repository RADONS.

One of the ARTEMIS mission recommendations was that LEGMC should ensure that the safety of ongoing activities at Salaspils Research Reactor is assessed. Safety assessment of ongoing activities at reactor was done in 2022 and was submitted to RSC together with other documents for receiving the renewed licence.

Article 16
Operation of facilities

- **Licensing procedures**

The licensing procedures for radioactive waste management facility are regulated mainly by licensing regulations, which cover the conceptual stage, design, construction, commissioning and operation of the facility. The operation license is valid for a period of 10 years.

The last license issued to the operator of radioactive waste management repository RADONS (in 2022) is based on conclusions obtained from Long-term safety analysis of the repository and an environmental impact assessment study as well as the EU Twinning Light Project Radioactive Waste Management and Reactor Decommissioning. RSC is assessing compliance to requirements with national legislation and existing standards. All safety related instructions and quality assurance programmes prepared by operator have been analysed and accepted by RSC.

- **Inspections**

Criteria of inspections have been developed for the frequency of inspections to be carried out, based on a risk assessment of potential hazards from sources of ionising radiation in the possession of operators and the activities to be carried out with them. The criteria have been developed on the basis of documents from the IAEA, as well as taking into account the specific situation and experience in Latvia. The development of the criteria also takes into account capacity. If necessary, the criteria for the frequency of checks shall be updated.

- **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 Climate and Energy can provide extra resources if needed.

External engineering and technical support are provided in the frame of the relevant IAEA Technical Co-operation Projects and by co-operation with the United States of America (Department of Energy) etc.

- **Incident Reporting system**

The provisions required reporting of incidents have been implemented in the Law on Radiation Safety and Nuclear Safety – operator and radiation protection officer is responsible for immediate incident reporting to the RSC and other institutions who are dealing with

radiation safety and nuclear safety issues. Fortunately, there has not been such event up to now. The minor deviations from safety requirements are registered by operator and discussed with RSC inspectors during the planned inspections. The corrective actions are always prepared and implemented.

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

Provision for future decommissioning plan for any facility where radioactive materials are used is required by Licensing Regulations. In 2021 Licensing Regulations were substituted by Regulations No 65 "Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (approved on 28.01.2021.) where requirements for decommissioning were prescribed - the initial decommissioning plan has to be reviewed and updated as necessary but at least every 5 years to include new information as appropriate. Safety assessment is a part of decommissioning plan in order to assess safety of planned decommissioning and dismantling activities. Decommissioning plan has to foresee cost estimate and ensuring financial resources for all planned decommissioning activities.

Cabinet Regulations "Requirements for Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002) foresee that before closure of the disposal facility a detailed consecutive implementation of a set of measures with an aim to upgrade safety has to be carried out. 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 Operations with Radioactive Waste and Materials Related Thereto" No.129 (19.03.2002) - Chapter X "Requirements for Radioactive Waste Management after Closure of Radioactive Waste Vault and Termination of Disposal Site Operation" (including monitoring, institutional controls and long-term knowledge preservation measures). There are no major changes for these requirements.

The Environmental Policy Strategy 2021 - 2027 stipulate that, in accordance with the laws and regulations, the state must ensure the supervision of the repository RADONS for 300 years after its closure, which is intended not earlier than in 2070. The decision on the operation/closure of the repository RADONS will be made in 2050 - 2060. The closure of the repository RADONS (procurement organisation, construction project, closure works) will be organised in 2060-2070. If a decision on the closure of the repository RADONS after 2070 is taken, an assessment will be carried out on the establishment of a new radioactive waste repository as well as an environmental impact assessment, a public participation and finally the construction of a new radioactive waste repository.

Section I
Transboundary movement

Article 27
Transboundary movement

Basic provisions of this Article have been implemented in Cabinet Regulations on Requirements for Operations with Radioactive Waste and Materials Related Thereto, No.129 (adopted 19.03.2002). These regulations stipulate that:

- RSC 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 a relevant request to give a corresponding conclusion;
- RSC 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 RSC had forwarded the permit to export radioactive waste for the purpose of its reprocessing.

RSC has never issued a permit for transboundary movement of radioactive waste.

Section J
Disused sealed sources

Article 28
Disused sealed sources

According to the Law on Radiation Safety and Nuclear Safety and Cabinet Regulations operator is responsible for safe management of radioactive sources (incl. disused sealed sources). Management of disused sealed sources is prescribed also by the requirements set in regulations on licensing and in Cabinet Regulations on Requirements for Operations with Radioactive Waste and Materials Related Thereto, No.129 (adopted 19.03.2002).

Based on these legal provisions and some experiences of practical implementation Latvia has sent a notification to the IAEA about implementation of Code of Conduct and recommendations for transboundary movements. In May 2023 Government of Latvia expressed their commitment to implement the supplementary guidance under the Code of Conduct entitled "Guidance on the Management of Disused Radioactive Sources" by sending official letter to IAEA.

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 RSC 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.

Practices towards safe disposal of disused sealed sources

Before issuing a licence for practices with sealed sources, the RSC requests information about the planned activities with the disused sealed sources. Sealed sources are mainly used in industry, science institutions and medicine.

The Cabinet of Ministers regulations "Requirements for the Practices with Radioactive Waste and Related Materials" No.129 (adopted 19.03.2002) and Cabinet Regulation No.65 „Regulations Regarding Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation" (adopted 28.01.2021) together with the Law on Natural Resource Tax encourage return of disused sources to their producers. If it is not possible, disused sources are disposed or stored in repository RADONS.

In case if orphan source the state is responsible for the safe management of source. Repository RADONS is used for disposal or storage of orphan sources. In Latvia a system has been established to ensure the localization of orphan source. Fixed radiation monitors and portable radiation detectors have been used on the borders and the largest collection points of scrap metal. In case of exceeded ionizing radiation levels RSC takes decision about investigation of this object (etc. organize measurements of radioactivity level). In case of a radioactive source RSC organizes the transportation of this source to the repository RADONS. LEGMC is responsible for the transportation and management of orphan sources.

In 2020 Law on Radiation Safety and Nuclear Safety was amended to include

requirements for financial assurance (Chapter IV[1]) and new Cabinet Regulations No. 464 "Regulations on financial security for activities with high-activity sealed sources" were adopted on 06.07.2021. that prescribe financial assurance requirements for high activity sealed sources (HASS sources). Financial assurance is required in order to ensure management of HASS sources in case of bankruptcy of operator or in case of expiration of authorization etc. In Latvia there are 3 HASS sources at the moment.

Section K
Planned activities to improve safety

Activities related to safety improvements are the project to upgrade repository RADONS - the construction of a new vault at repository RADONS and a long-term storage facility for intermediate level waste and final capping of historical vaults. These activities are connected with decommissioning of Salaspils Research Reactor. Detailed information about these projects is available in Article 14 and 26 of this report. All these activities are included in the Environmental Policy Strategy 2021-2027. The Environmental Policy Strategy includes not only goals for the reference period 2021–2027, but long-term goals as well (see Article 11).

In 2019 two review missions in Latvia were conducted - the Integrated Regulatory Review Service (IRRS) and the Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS). The preparation for the missions and the self-assessments already led to the identification of several areas for improvement and development of preliminary Action Plan. Both missions resulted in several suggestions and recommendations that were included in the updated Action Plan. **IRRS follow-up missions are planned to take place in October 2024.**

Recommendations from missions include for example, updating requirements in the legislation concerning emergency preparedness and response and radioactive waste management, revising national policy and strategy to detail the preferred management option for intermediate level waste, to reflect the preferred long term options for management of radioactive waste (including long-term targets and end states), to take into account the interdependencies between related actions and their associated risks, considering uncertainties in knowledge, and evaluating existing provisions to ensure timely implementation of the strategy, including effective means of preventing and mitigating omissions, deviations, failures, and delays.

Both IRRS and ARTEMIS missions emphasised that national policy has to define long-term goals for safe management of all classes of existing and future radioactive waste streams (including intermediate level waste (ILW)). These recommendations were taken into account in the new Environmental Policy Strategy for 2021-2027. IRRS mission also pointed out several requirements that have to be updated in Cabinet Regulations “Requirements for Operations with Radioactive Waste and Materials Related Thereto” No.129 (19.03.2002) (clearance criteria, classification of waste, independent review of safety case and safety assessment by licensee). Revision of Regulations is planned in 2025.

There were two challenges identified for Latvia during the 7th Review Meeting:

1) **Decommissioning funding and technical challenges of Salaspils Research Reactor**

On 20.05.2020. a tender was announced for preparation of decommissioning and dismantling plan for Salaspils Research Reactor. A contract concluded on 28.04.2021. “Study of the Salaspils research reactor, development of the construction project for the decommissioning and dismantling of the Salaspils research reactor and author supervision”. The following was done during implementation of the project:

• In 2021 a lot of work was done related to study of available operational and historical documentation and data of previous investigations. Preparation of radiological survey program, geometric survey of site and scanning of premises for preparation of 3D model of reactor building, rooms and systems.

• In 2022 finalized radiological survey program, work programme for field radiological measurements and a radiological survey done according to program, prepared report on radiological field measurements. Prepared and approved construction design task. Also submitted first revision of reactor decommissioning plan.

• In 2023 construction permit was issued by RSC (allowed to start drawing up a building design).

• In 2023 surface smear test sampling done according to field measurements, water sampling, boring and sampling of biological shielding. Laboratory measurements of the collected smears, solid material and water samples were carried out.

It is planned that the building design for decommissioning of Salaspils Research Reactor (also decommissioning and dismantling plan), will be completed in 2024-2025. Final decommissioning tender will be announced after implementation of building design project.

2) Upgrade of repository "Radons" (new radioactive waste vault, storage facility for intermediate level radioactive waste, capping of closed radioactive waste vaults) - funding and technical challenges

In the period covered in this report essential activities took place regarding upgrade of repository RADONS capacity. In 2021 a contract was concluded for "Development and author supervision of the construction project of new radioactive waste disposal vault, long-term storage facility and final cover of the closed radioactive waste disposal vaults for the radioactive waste repository "Radons". Project was started in 2021 with developing of construction intention (building design in minimum composition) for new facilities (disposal vault and long-term storage facility) and final capping of the closed radioactive waste vaults. On 13.01.2022. construction permit was issued by RSC allowing to start drawing up a building design. On 14.11.2023. building design of upgrade repository RADONS was accepted by RSC and also estimated cost of construction was calculated.

After the Salaspils Research Reactor decommissioning building project is accepted, both projects - the Salaspils Research Reactor decommissioning project and the upgrade repository RADONS project with cost assessments will be submitted to the Cabinet of Ministers for a decision on their further implementation.

Section L Annexes

Annex A
Overview Matrix of current practice of Radioactive Waste Management in Latvia

Type of Liability	Long-term management policy	Funding of Liabilities	Current practice / Facilities	Planned facilities
Spent fuel	Not applicable. SNF from research reactor returned to Russian Federation			
Nuclear fuel cycle wastes	Not applicable			
Application wastes	Disposal, centralized treatment, long-time storage facility for intermediate level waste (ILW), regional approach for disposal	Users, environmental tax, State budget	Near surface repository RADONS	New repository vault and long-term storage facility for intermediate level waste (ILW) planned at the existing repository RADONS
Decommissioning	Dismantling (“brown field”)	State budget	Minor decommissioning activities	Expansion of the repository RADONS (disposal site)
Disused Sealed Sources	Return to supplier, disposal or storage pending disposal	Users, environmental tax, State budget	Centralized storage or disposal (repository RADONS) if return is impossible	Long-term storage at the repository RADONS (disposal site)

Annex B
Inventory of radioactive waste

List of spent fuel management facilities: None.

List of radioactive waste management facilities: There are two main facilities:

1. Radioactive waste disposal site – near surface radioactive waste repository RADONS;
2. Pre-treatment and conditioning facility at Salaspils site, which has also storage for conditioned cemented radioactive waste to be collected before transportation to the disposal site – repository RADONS.

Basic information about facility

Repository 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 repository 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).

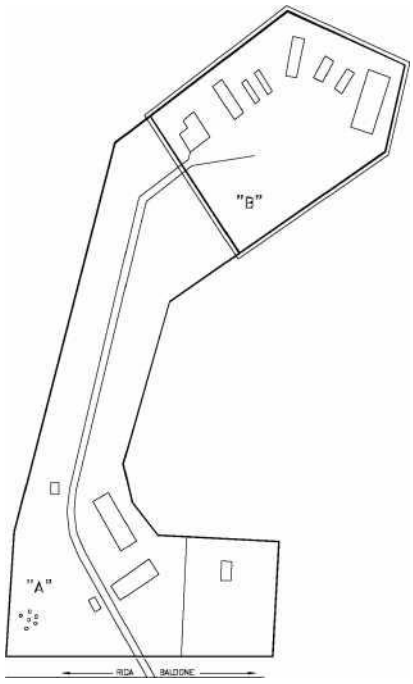


Figure 1 Arrangement of the radioactive waste repository RADONS

There are 7 disposal radioactive waste vaults: vaults No 1-6 are partly covered with concrete or asphalt layers (historical vaults) and one operational vault No 7.

LEGMC shall ensure also long-term storage of all intermediate level waste (ILW) until finding of disposal solution. The institutional control after the closure of the repository is foreseen for the period of 300 years.

- **List of nuclear facilities in the process of being decommissioned:** Salaspils Research Reactor.
- **Inventory of spent fuel:** Nothing remains at the site.

- **Inventory of radioactive waste:** The total radioactivity of waste accepted for disposal or long-term storage over 60 years of operation of the site, taking into account the radioactive decay, at the end of 2023 is around 2,36 x 10^{14} Bq and total volume about 893 m^3. The amount of radioactive waste accepted per year varies from one year to another, in the period 2019-2023 is around 10^9-10^{12} Bq. The volume of accepted radioactive waste is low.

The annual accepted radioactive waste volumes and their activities are illustrated in Table 1. Radioactivity for all radionuclides is given in Table 2 (data re-calculated on 1 April 2024).

Table 1

Annual amount of radioactive waste received by repository RADONS

Year	Volume, m^3	Activity, Bq
2000	16	3,50E+12
2001	16	4,80E+12
2002	16	8,50E+13
2003	7	9,50E+12
2004	14	7,00E+13
2005	17	1,20E+12
2006	17	1,40E+13
2007	5	3,20E+13
2008	6,6	1,27E+14
2009	8,5	1,38E+12
2010	7,2	8,04E+06
2011	11,9	4,22E+12
2012	15,3	1,27E+08
2013	0,822	3,87E+10
2014	0,5	7,20E+09
2015	1	2,39E+10
2016	0,6	7,40E+10
2017	0,065	8,24E+08
2018	0,12	5,09E+09
2019	0,04	1,40E+09
2020	0,3	9,42E+09
2021	0,72	27,4E+12
2022	0,7	2,4E+09
2023	0,59	1,18E+10

In 2018 2 m^3 of radioactive waste was placed in Salaspils Research Reactor for temporary storage before conditioning and transportation to repository RADONS.

Table 2

Radioactive waste inventory at repository RADONS (01.04.2024)

Nuclide	Interim storage	Vault 1	Vault 2	Vault 3	Vault 4	Vault 5	Vault 6	Vault 7	Total
Ag-108m								6,03E+04	6,03E+04
Al-26				1,05E+12				7,22E+00	1,05E+12
Am-241	9,86E+06		7,88E+04	1,03E+11	2,94E+10		5,26E+11	3,34E+12	4,00E+12
Ba-133	4,10E+05	2,29E+08	1,02E+06	9,38E+10	1,01E+07		2,46E+08	4,58E+06	9,43E+10
Bi-207				4,70E+07			1,17E+08	6,32E+04	1,64E+08
Bi-210m				2,64E+08					2,64E+08
C-14	4,77E+08	4,43E+11	2,05E+09	9,99E+11	2,80E+11	1,23E+08	1,02E+11	2,71E+10	1,85E+12
Cd-109	3,66E+02		9,86E+03	4,07E+02	1,23E+01		1,89E+03	1,59E+05	1,71E+05
Cd-113m				3,23E+07					3,23E+07
Cf-252	1,54E+04							3,35E+03	1,78E+04
Cl-36		1,01E+12	7,70E+03	4,29E+12	1,22E+08	4,11E+07	2,45E+10		5,32E+12
Cm-244			6,95E+02				3,00E+05	5,06E+08	5,06E+08
Co-57	1,06E+05							5,64E+00	1,06E+05
Co-60	1,94E+08	2,12E+10	1,15E+05	1,08E+11	1,07E+10	6,91E+06	8,61E+10	4,47E+13	4,49E+13
Cs-134		1,53E+03	3,62E+00	1,42E+06	3,14E+03	8,83E+02	4,62E+04		1,47E+06
Cs-137	7,47E+09	1,78E+12	1,36E+08	3,74E+13	1,38E+12	1,90E+07	1,21E+13	4,91E+13	1,02E+14
Eu-152	2,67E+05	9,73E+08	2,14E+04	2,21E+09			8,35E+09	8,78E+10	9,84E+10
Eu-154	9,24E+05	1,19E+07		8,02E+08				1,17E+09	1,99E+09
Eu-155		7,26E+02							7,26E+02
Fe-55	2,17E+03	2,69E+05		2,07E+08	4,69E+06	1,02E+04	2,53E+07	3,23E+09	3,46E+09
H-3	3,41E+09	1,49E+10	1,68E+09	5,81E+12	4,14E+09	7,12E+06	1,65E+12	1,86E+13	2,61E+13
K-40		3,70E+10	2,02E+03	8,81E+10					1,25E+11
Kr-85		6,52E+08		1,17E+10	4,40E+09		1,11E+10	1,35E+12	1,39E+12
Mo-93				1,83E+07			1,83E+07		3,66E+07
Na-22	4,66E+05	2,56E+04		7,15E+07	7,44E+03	2,29E+03	1,22E+05	7.42E+02	7,21E+07
Nd-144		9,96E+07					1,00E+08		2,00E+08
Ni-59				1,80E+09		4,11E+07			1,84E+09
Ni-63		1,51E+11		8,10E+12			3,26E+10	1,06E+10	8,29E+12
Np-237								1,10E+05	1,10E+05
Pb-210	9,01E+04	2,95E+10	6,17E+03	4,52E+11	1,06E+07	2,49E+07	4,72E+08	7,82E+06	4,82E+11
Pd-107				5,55E+09			1,82E+09		7,37E+09
Pm-147		4,32E+05		5,82E+08	1,69E+07		2,01E+08	2,89E+09	3,69E+09
Pu-238				5,26E+09	2,78E+10		2,06E+11	5,30E+12	5,54E+12
Pu-239	1,64E+04	1,85E+11		1,59E+12	8,86E+10	1,85E+09	1,02E+12	2,80E+12	5,689+12
Ra-226	1,43E+07	8,52E+11	6,03E+09	7,68E+10	3,43E+04	3,64E+07	2,67E+11	3,89E+09	1,21E+12
Rh-102								6,73E+02	6,73E+02
Ru-106								1,98E+04	1,98E+04
Sb-125		2,77E+05		1,46E+07			5,94E+04		1,50E+07
Sm-145								1,65E+05	1,65E+05
Sm-151				1,77E+08					1,77E+08
Sn-121m				2,30E+07					2,30E+07

Sr-90	1,28E+08	9,58E+11	1,87E+05	1,69E+12	3,44E+11		8,85E+11	1,84E+13	2,23E+13
Tc-99			2,00E+03	1,10E+09	8,98E+07		3,20E+08	1,60E+08	1,67E+09
Th-228	2,89E+06		1,41E+05				3,36E+01	3,70E+02	3,03E+06
Th-230				1,67E+04					1,67E+04
Th-232	1,57E+05	4,24E+06	1,18E+08	9,39E+05			1,72E+08	7,62E+08	1,06E+09
Ti-44				1,82E+09			9,58E+07	1,51E+05	1,92E+09
Tl-204		3,03E+07		1,23E+08	6,09E+07		1,87E+09	1,04E+10	1,25E+10
U-232		4,56E+10							4,56E+10
U-233				3,50E+04	8,04E+06		8,72E+05	1,72E+05	9,12E+06
U-234				2,21E+03			2,15E+04	7,30E+01	2,38E+04
U-235	6,14E+02	6,07E+05		3,57E+04			4,27E+03	1,13E+05	7,60E+05
U-238	2,65E+04	8,22E+07	1,29E+08	2,17E+07	3,58E+03		2,70E+07	6,11E+10	6,14E+10
Zn-65								3,24E+02	3,24E+02
Zr-93		1,78E+07		1,41E+09			2,22E+07		1,45E+09
Total	**1,17E+10**	**5,53E+12**	**1,02E+10**	**6,19E+13**	**2,17E+12**	**2,15E+09**	**1,69E+13**	**1,44E+14**	2,31E+14

Table 3

Categories of radioactive waste at repository RADONS (01.01.2024.)

Category	Volume of disposed waste (m^3)	Volume of waste in storage (m^3)
Very low level waste (VLLW)	No	No
Low level waste (LLW)	783	56 m^3
Intermediate level waste (ILW)	35 (incl. ~ 26 000 disused sources)	19 m^3
High-level waste (HLW)	No	No

In 2018 2 m^3 of radioactive waste was placed in Salaspils Research Reactor for temporary storage before conditioning and transportation to repository RADONS.

Table 4

Radioactive waste radioactivity and amount of ionizing radiation sources in the vaults of repository RADONS (01.01.2024.)

Radioactive waste vault No.	Radioactivity, TBq (01.01.2024.)	Total amount of ionizing radiation sources
1	5,56	2 823
2	0,0102	264
3	62,6	9 401
4	2,19	1 361
5	0,00215	113
6	17,2	19 072
7	148	60926
Interim storage facility	0,0119	1232
Total	236	95192

Annex C

References to Latvian legislation and reports related to safety of radioactive waste

1. References to national laws, regulations, requirements, guides, etc.:

- Law on Radiation Safety and Nuclear Safety, adopted 07.11.2000
- Civil Defence and Catastrophic Management Law, adopted 05.05.2016
- Construction Law, adopted 09.07.2013
- The Cabinet Regulations on Notification, Registration, and Licensing of Activities with Sources of Ionising Radiation, No.65, adopted 28.01.2021
- The Cabinet Regulations on Regulations on financial security for activities with high-activity sealed sources, No. 464, adopted on 6 July 2021
- The Cabinet Regulations on the Procedure for Packaging and Marking of Ionising Radiation Sources, No.406, adopted 18.09.2001
- The Cabinet Regulations on the Procedure for Control and Accounting of Exposure of Workers, No.1284, adopted 12.11.2013
- The Cabinet Regulations on Requirements for Operations with Radioactive Waste and Materials Related Thereto, No.129, adopted 19.03.2002
- The Cabinet Regulations on Protection Against Ionising Radiation, No.149, adopted 09.04.2002
- The Cabinet Regulation on Generic Principles for Exchange of Radioactive Waste, No.157, adopted 16.04.2002
- The Cabinet Regulation on Procedure on the Radiometric Control of Cargo, Baggage, Persons and Vehicles on the State Border and the Training Requirements by Persons Involved in the Radiometric Control, No.535, adopted 22.09.2015
- The Cabinet Regulations on the Procedure Governing Activities Involving Nuclear Materials, Related Materials and Equipment, No.398, adopted 22.04.2004
- The Cabinet Regulations on Physical Protection of Ionising Radiation Sources, No.508, adopted 04.11.2002
- The Cabinet Regulations on Preparedness and Response in Cases of Radiation Accidents, No.152, adopted 08.11.2003
- The Cabinet Regulations on Procedures for Building of Facilities Related to Radiation Safety, No.661, adopted 24.11.2015
- Environmental Policy Strategy 2021-2027, Annex 3 “Radiation Safety Programme” (approved by Cabinet of Ministers Order No.583 (31.08.2022)

2. References to official national and international reports related to Conventions:

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

- First report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2003
- Second report submitted by Latvia under the Convention on the Safety of Spent Fuel

Management and on the Safety of Radioactive Waste Management, 2005

- Third report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2009
- Fourth report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2011
- Fifth report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2014
- Sixth report submitted by Latvia under the Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2017

Convention on Nuclear Safety:

- Republic of Latvia first National Report On the implementation of the obligations under the Convention on Nuclear Safety, 1998
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2001
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2004
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2007
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2011
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2013
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2016
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2019
- Republic of Latvia National Report On the implementation of the obligations under the Convention on Nuclear Safety, 2021

3. European Commission:

- Main Findings of the Commission's Article 35 Verification in Latvia, 21 to 24 March 2006 (LV-06/01) and Technical Report Verifications under the Terms of Article 35 of the EURATOM Treaty "Latvian National Monitoring Network for Environmental Radioactivity", 2006, (LV-06/01)
- Main conclusions of Commission's Article 35 Verification in Latvia "National monitoring network for environmental monitoring", 10 to 13 June 2014 (LV 14-01) and Technical Report Verifications under the Terms of Article 35 of the EURATOM Treaty, "Environmental radiological monitoring in Latvia", 2014, (LV 14-01)
- Main conclusions and Technical Report of Commission's Article 35 Verification in Latvia "Routine and emergency radioactivity monitoring arrangements Monitoring of radioactivity in drinking water and foodstuffs", 11-13 October 2022 (LV 22-04)
- Republic of Latvia National Report on the implementation Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (2016, 2018, 2021 and 2024)

4. References to reports on international review missions:

(1) Infrastructure Appraisal for Latvia on Radiation Safety, 04-08 December 2008 (RaSIA 18/2006/LAT)

(2) Peer appraisal of the arrangements in the Republic of Latvia regarding the preparedness for responding to a radiation emergency (EPREV report, 2011)

(3) World Health Organization "Joint External Evaluation of IHR Core Capacities of Republic of Latvia" (2017, http://www.who.int/ihr/publications/WHO-WHE-CPI-2017-27/en/)

(4) Report of the Integrated Regulatory Review Service (IRRS) Mission to the Republic of Latvia, 2019

(5) Report of the Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) Mission to Latvia, 2019