



**Republic of Lithuania**

**Lithuanian 3rd National Report on  
Implementation of 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**

**VILNIUS, 2021**

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## LIST OF ABBREVIATIONS

CPMA – Central Project Management Agency  
EIA – Environmental Impact Assessment  
EPA – Environmental Protection Agency  
IAEA – International Atomic Energy Agency  
INPP – Ignalina Nuclear Power Plant  
IRRS – Integrated Regulatory Review Service  
LILW – Low and Intermediated Level Waste;  
LILW-LL – Low and Intermediated Level Waste Long-Lived  
LILW-SL – Low and Intermediated Level Waste Short-Lived  
NPP – Nuclear Power Plant  
PSAR – Preliminary Safety Analysis Report  
RAW – Radioactive Waste  
RPC – Radiation Protection Centre  
RATA – State Enterprise Radioactive Waste Management Agency  
SAR – Safety Analysis Report  
SF – Spent Fuel  
SNFSF – Spent Nuclear Fuel Storage Facility  
SSS – Spent Sealed Sources  
VATESI – State Nuclear Power Safety Inspectorate  
VLLW-SL – Very Low Level Waste Short-Lived

# INTRODUCTION

## *Aim of the Report*

The present Report was prepared according to Article 14.1 of 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 (hereinafter referred to as the Waste Directive).

This is the third Report of Lithuania for the Waste Directive. The aim of the Report is to demonstrate how Lithuania implements its obligations under the Waste Directive since the last Report.

This Report was prepared according to the Final Guides for MS Reports to the Waste Directive developed by European Nuclear Safety Regulators Group (ENSREG).

## *Sources of Radioactive Waste*

### *1. Nuclear power plants*

There is only one nuclear power plant in Lithuania - Ignalina NPP (INPP). It is situated in the North-East of Lithuania near the borders of Latvia and Belarus, on the bank of the largest Lithuanian water-body, Drūkšiai Lake. The INPP has two units of RBMK-1500 reactors. RBMK-1500 is the last and the most advanced version of RBMK-type reactor design series (actually, only two units were constructed).

INPP reactors were commissioned in December 1983 and August 1987 respectively. Original design lifetime of power units was 30 years. After the accident in Chernobyl, INPP safety systems were re-evaluated and it was decided to decrease the maximum thermal power of the units from 4800 to 4200 MW. That limited the maximum electric power to about 1250 MW per unit.

Now both INPP units are under decommissioning. Unit 1 of INPP was shut down on 31 December 2004 and the second unit of INPP was shut down at the end of 2009 according to the obligations of Treaty of Accession of Lithuania to European Union.

INPP is the main source of radioactive waste in Lithuania, producing more than 99% of radioactive waste. Waste of INPP came from operation and now from the decommissioning activities. Spent fuel is considered as radioactive waste in Lithuania. Operational solid waste is stored in storage facilities without conditioning, therefore it will be retrieved, conditioned (sorted, super compacted, incinerated, grouted), stored in new storage facilities and later will be placed in repositories. Liquid waste is evaporated and later either bituminized (evaporator concentrate) or cemented (ion-exchange resins, filter aid (perlite), sediments of evaporator concentrate). Repository for short-lived very low-level waste is already constructed and now is under preparation for its operation. Repository for short-lived low and intermediate level waste is going to be constructed. Construction of a Deep Geological repository for long-lived waste including spent fuel is also planned. Inventory of waste according to Lithuanian radioactive waste classification and dates for the implementation of planned radioactive waste facilities is given in Articles 11-12 of this Report.

### *2. Radioactive sources*

At the end of 2020 there were 1508 sealed radioactive sources (except of 8800 Pu-239 sealed sources in 4400 smoke detectors at INPP) used in Lithuania. The number of sealed radioactive sources is continuously decreasing due to implementation of new technologies. Lithuanian enterprises discontinue usage of sealed sources in gamma radiographs, gamma relays, various control devices and gauges (they are being replaced by other equipment, based on X-ray and other modern technologies). When sealed radioactive sources are declared as disused, and if due to unforeseen circumstances there are no possibilities to return them back to supplier, they are sent to INPP radioactive waste interim storage facility.

According to the Law on Radioactive Waste Management, INPP, as an appointed radioactive waste manager, manages disused radioactive sources transferred by other radioactive waste producers (small radioactive waste producers). INPP:

- collects disused radioactive sources and organizes its shipment from small radioactive waste producers, performs initial, basic and final treatment of this radioactive waste and stores it;
- manages orphan radioactive sources and objects contaminated with radioactive materials in accordance with the procedure established by the Government.

The amount of unsealed radioactive sources used in nuclear medicine for diagnostics of various diseases and treatment is increasing every year. The unsealed radioactive sources administered to the patients in a form of radiopharmaceuticals (liquids, capsules, powder) contain Tc-99m, I-123, I-131, F-18 and other radionuclides. Biomedical industry and other scientific research facilities applies unsealed radioactive sources with I-125, P-32, P-33, H-3 and S-35 radionuclides. The overall activity of received unsealed radioactive sources in 2020 exceeded 10.9 TBq.

### *Legacy waste*

Maišiagala radioactive waste storage facility is located near the village of Maišiagala, about 30 km to the North-West of Vilnius. This storage facility was designed for institutional waste disposal as a typical *Radon* type facility, which had been constructed since the early 1960s in all the countries of the former USSR. Maišiagala radioactive waste storage facility was in operation between 1964 and 1989. Maišiagala facility contains institutional waste generated up to 1989. The waste consists of static electricity neutralizers and neutron generators, an assortment of chemical compounds, gamma radiation sources with their shielding, different isotopic instrumentation with beta sources, blocks of gamma relays, radium salts, radioactive light emitters and fire sensors, radioactive sources, high-activity gamma sources with their biological shielding. The radionuclides important for long-term safety assessment are H-3, C-14, Cl-36, Co-60, Sr-90, Cs-137, Eu-152, Ra-226 and Pu-239.

Waste is stored in a reinforced concrete vault with internal dimensions 14.75x4.75x3 m (volume 200 m<sup>3</sup>). The vault was only partially filled with waste during operation (about 60% of the volume). The waste was inter-layered with concrete. Sealed sources are stored in stainless steel containers. At the time of closure, the residual volume was filled with concrete and sand. In 2004-2006, the Maišiagala storage was essentially upgraded by installing new radiological and physical protection barriers.

From 1973 to 2002, the operation and maintenance of this facility was under the responsibility of the Institute of Physics. In 2002, this responsibility was transferred to RATA. RATA obtained license for Maišiagala storage facility in 2006. After reorganisation when RATA was joined to Ignalina NPP in 2019, Ignalina NPP took over the full responsibility for Maišiagala storage facility.

Now only INPP is responsible for surveillance of Maišiagala radioactive waste storage facility and received the license for the operation of the Maišiagala radioactive waste storage facility. Currently institutional control of the storage is performed which includes physical protection, environmental monitoring and public information activities.

Decommissioning of the Maišiagala radioactive waste storage facility is Ignalina NPP project. Agreement for “Decommissioning of the Maišiagala radioactive waste storage facility” between Ignalina NPP and Environmental Project Management Agency was signed on November 15, 2016. The project “Decommissioning of the Maišiagala radioactive waste storage facility” is financed by EU Cohesion Fund Structural Assistance Programme.

Implementation of Decommissioning project of Maišiagala RAW storage facility started in December 2016. EPA on 5<sup>th</sup> June 2018 made the decision on possibility of decommissioning of radioactive waste storage facility in Maišiagala.

The first part of Decommissioning project: development of the Final Decommissioning Plan and Environmental Impact Assessment Report, licensing, designing and other preparation tasks was

accomplished in the first quarter of 2021. Second part of Maišiagala RAW storage Decommissioning Project started with the public tender for preparatory works for the demolition of Maišiagala RAW storage buildings, including the construction and installation of temporary structures. Decommissioning project should be completed in 2023.

### ***Specific items regarding radioactive waste management in Lithuania***

It should be noted that according to the Law on Radioactive Waste Management the spent fuel is considered as radioactive waste in Lithuania.

All radioactive waste management facilities in Lithuania are considered as nuclear facilities. Operators have to have a license in order to operate nuclear facilities. All nuclear facilities are situated at the territory of Ignalina NPP, with the exception of Maišiagala radioactive waste storage facility, which is about 30 km north-west from the capital of Lithuania Vilnius. All nuclear facilities in Lithuania are licensed.

### ***Competent Regulatory Authority***

#### *State Nuclear Power Safety Inspectorate (VATESI)*

State Nuclear Power Safety Inspectorate (VATESI) is state regulatory and supervisory authority in Lithuania for activities involving nuclear materials and other activities with sources of ionizing radiation in the nuclear power area. VATESI sets safety requirements and regulations, supervises compliance with them (incl. inspections), applies enforcement measures in case of incompliance with safety requirements and regulations, issues licenses, permits and temporary permits, assess safety of nuclear facilities.

#### *Radiation Protection Centre (RPC)*

RPC is the regulatory authority implementing regulatory control over the exposure of humans and the environment and practices except those with sources of ionizing radiation in the nuclear energy area. RPC organizes state radiological environmental monitoring too.

#### *Ministry of Environment*

Ministry of Environment coordinates the process of EIA of proposed economic activities in the transboundary context and takes part in the issue of licences in the radioactive waste management activities in accordance to the Law on Nuclear Safety. State Territorial Planning and Construction Inspectorate under the Ministry of Environment takes part in state supervision and control of design and construction of nuclear facilities.

Environmental Protection Agency under the Ministry of Environment (EPA) organizes state environmental monitoring (excluding radiological), coordinates the process of EIA, and makes decisions on environmental impact assessment reports.

In 2020 the amendments of the Law on Radiation Protection were introduced (entered into force on January 1<sup>st</sup>, 2021) transferring responsibilities to coordinate and perform state environmental radiological monitoring, also to control environmental radiological monitoring of economic entities and exchange monitoring information with other countries from EPA to RPC.

More information on regulatory authorities is provided in Article 6.

### **Licence holders**

SE Ignalina NPP has licences (either construction and/or operation) for all radioactive waste management facilities in Lithuania.

## **National Policy**

National radioactive waste management policy is described in Article 4 of this Report.

## **RECENT DEVELOPMENTS**

Recent developments in the area of spent fuel and radioactive waste management in Lithuania since the presentation of the second Report as follows:

### **National framework**

1. State Enterprise Radioactive Waste Management Agency (RATA) was reorganized and joined to the State Enterprise Ignalina Nuclear Power Plant in 2019. Until 2019, RATA was responsible for the development of the Deep Geological Repository Development Project and main implementer of the Radioactive Waste Management Development Programme measures dedicated to the Deep Geological Repository. Lithuanian government after evaluation of performance of the RATA, decided to make reorganization of it. Amendments made in the Law on Radioactive Waste Management at 2018. By these amendments of the Law Ignalina NPP was assigned as sole entity that would be responsible for safe management of all radioactive waste and spent nuclear fuel including disposal.

2. The amendment of the Law on Strategic Management (2020) and Methodology on Strategic Planning (2021) triggered preparation of the amendment of the Radioactive Waste Management Development Programme (2015). The Ministry of Energy, executing as the institution responsible for the state policy in the area of radioactive waste management, together with other stakeholders started preparation of the new Radioactive Waste Management Development Programme. The new Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (Development Programme) was approved by the Government of Lithuania on February 3, 2021 by Resolution No 76. Development Programme was prepared based on Radioactive Waste Management Development Programme (2015), INPP FDP (renewed version of 2020), taking into account requirements of the national legal acts, Directive 2011/70 EURATOM and requirements of the new Law on Strategic Management (2020) and Methodology on Strategic Planning (2021). Development Programme implements the tasks of the 2021–2030 National Progress Plan approved by the Government on 9 September 2020.

Taking into account requirements of the Methodology on Strategic Planning were prepared and adopted Development Programme and Implementation Measures of the Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (Implementation Measures) (approved by the Order of the Minister of Energy).

Development Programme and Implementation Measures establishes an overall framework for the safe management of SF and all RAW categories. It guarantees that at all the stages of SF and RAW management effective protection from potential dangers will be established, in such a way that the individuals, the public and the environment will be protected from the harmful impact of the ionizing radiations now and in the future, so the needs and the aspirations of today's generation to be satisfied without endangering the possibilities of the future generations to satisfy their needs and aspirations (details in Article 11 and 12 of this Report).

3. Integrated Regulatory Review Service (IRRS) Follow up mission to the Republic of Lithuania took place from the 10<sup>th</sup> of November to the 2<sup>nd</sup> of December 2020. The purpose of the IRRS follow-up



mission was to review progress in implementing improvements resulting from the 2016 year initial IRRS mission recommendations and suggestions. The IRRS follow-up mission has also addressed areas of significant change since the last mission. Information that is more detailed is presented in the Article 14.3 of this Report.

4. ARTEMIS mission planned at the beginning of 2021 were postponed to IV quarter of 2021 (backup date – II quarter of 2022) due to COVID-19 pandemic situation.

### **New nuclear facilities of INPP decommissioning infrastructure**

1. Technical Design and preliminary Safety Analysis Report (SAR) of Near Surface Repository (NSR, project B25) were finally approved by State Institutions in May 2017. Permission for NSR construction was granted by the Ministry of Environment in May 2017. License for NSR construction and operation was granted by VATESI in November 2017. Currently the procurement procedure for construction tender finished in January 2021. After evaluation of proposals contract for construction of NSR will be signed. The aim is to start the tender for the NSR construction in 2021.

2. Permission for Construction of Very Low-Level Radioactive Waste Landfill Disposal Modules (project B19-2) was granted by Ministry of Environment in October 2015. License for construction and operation of Landfill Disposal Modules was granted by VATESI in December 2015. The contract for construction works was signed in June 2017. Construction of Landfill Disposal modules started in October 2017. Construction of Landfill facility for VLLW completed in May 2021. Start of operation (first campaign) is expected in 2022.

3. New interim spent nuclear fuel storage facility (SNFSF – 2) in the frame of project B1 was put into industrial operation in May 2017. The Technical Design documentation and PSAR for Heavily Damaged Spent Fuel Handling System (DFHS), within the frame of project B1, was approved by VATESI in January 2016. DFHS was manufactured by the contractor in 2019. All SF, including Heavily Damaged Spent Fuel, was unloaded from Unit 1 of INPP and transported to SNFSF-2 until April 2021. Currently all spent fuel pools (SFP) at Unit 1 are free from spent fuel. Heavily Damaged Spent Fuel management at Unit 2 will be started on the second half of 2021. All Heavily Damaged Spent Fuel from Unit 2 will be transported to SNFSF-2 by the end of 2022.

4. Solid Waste Retrieval Facility (SWRF, project B2) construction works had been entirely completed by the Contractor in 2017. On June 9, 2017, the B2 hot trials have started after completion of cold trials and VATESI has issued the operation licence. INPP prepare and agree with VATESI the final SAR for SWRF after completion of hot trials. Industrial operation of SWRF started in 2020.

5. The construction of the new solid radioactive waste treatment and storage facility (SWTSF, project B3/4) was completed by the Contractor in 2017. On October 13, 2017, SWTSF hot trials have started after completion of cold trials and VATESI has issued the operation licence. Following completion of hot trials the final SAR will be prepared and agreed with VATESI. It is scheduled to put SWTSF in industrial operation in 2021.

### **INPP dismantling and decontamination (D&D) projects**

1. The D&D project B9-1 aiming at dismantling and decontamination of the equipment located at INPP Unit 1 Turbine Hall (Building G1) was commenced in October 2007. To date, all the scheduled project works have been performed. INPP prepared and agreed with VATESI the corresponding report on project completion in March 2017.

2. The D&D project B9-1(2) aiming at dismantling and decontamination of the equipment located at INPP Unit 2 Turbine Hall (Building G2) was commenced in September 2011. To date, D&D works are ongoing in accordance with the schedule.
3. The D&D project B9-3(1) aiming at dismantling and decontamination of the equipment (such as top metal structure filled with serpentinite, sand cylinder, annular water tank, reactor vessel, bottom metal structure, steel blocks, roller supports, graphite stack) located at INPP Unit 1 reactor building (building A1):
  - Technical Design documentation for preparatory works and creation of Block A Pre-treatment Workshop (APW) was prepared by INPP and agreed by VATESI. Unit 1 operation licence amendment for implementation of preparatory works was issued in October 2016. Procurement of equipment for a Block A Pre-treatment Workshop and preparatory works is ongoing.
  - The D&D project B9-3(1) was divided into three projects: The D&D project B9-3(1)R1&R2 is dedicated for upper and lower part of reactor vessel it was agreed by VATESI in July 2021; The D&D project B9-3(1)A1 is dedicated for the whole technological equipment in block A1, it was agreed by VATESI in April 2021; The D&D project B9-3(1)A1 Refuelling machine is dedicated for the Unit 1 reactor refuelling machine complex in block A1, it was agreed by VATESI in April 2019, to date, decommissioning works are completed, but decontamination works are still ongoing; The D&D project B9-3(1) R3 it is dedicated for the reactor itself. This project is planning to appear in near future - 2023.
4. The D&D project B9-7/1 aiming at dismantling and decontamination of the equipment located at INPP Unit 1 Deaerator Hall (Building D1) was finished and the corresponding report on project completion was agreed with VATESI in December 2019.
5. The D&D project B9-7/2 aiming at dismantling and decontamination of the equipment located at INPP Unit 2 Deaerator Hall (Building D2) was commenced in July 2018. To date, D&D works are ongoing in accordance with the schedule.
6. In frame of the projects MTF.01 and MTF.02 (Metal Treatment Facility) additional decontamination equipment is being procured and installed in auxiliary building 130/2 in order to enhance INPP Unit 1 and Unit 2 D&D projects in their capacities for initial treatment of the anticipated metal waste streams.
7. The demolition project of warehouses “03” and “04” was agreed by VATESI in April 2020 and was completed in the same year.
8. The demolition project of the building “129” was agreed by VATESI in July 2021. Demolition works are planning to start in 2023.
9. Maišiagala repository decommissioning license was issued in May 2021. The decommissioning works are planning to start in 2021.
10. EPA on 25th of October 2019 has received EIA report on Dismantling and decontamination of INPP Units A-2 and V-2 (project 2210, Phase 1) (cross-border consultations ended only in 2021) and on 21 of April 2021 has made the decision on the possibilities of dismantling and decontamination of the facilities of Units A-2 and V-2 of the INPP (project 2210, Phase 1). Also, on 18 of May 2021, the EIA report on dismantling and decontamination of the equipment of the work areas of INPP Unit 2 R1 and R2 EPA has received (project 2102). This report is under review.

### ***Article 12.1 (c), Article 14.2 (b) - Scope and inventory***

**Current inventories at INPP as follows:**

As of 2021-05-31, the operated SNFSF-1 contains 20 CASTOR RBMK casks and 98 CONSTOR RBMK casks, with 12032 spent fuel bundles (6016 spent fuel assemblies) of RBMK type, with initial uranium enrichment 2%. The total activity of spent fuel at the operated SNFSF-1 is - 3.09E18 Bq. As of 2021-05-31, 179 casks (total amount - 190) with spent fuel are stored in the SNFSF-2. Currently SFP of Unit 1 are fully empty. 11 casks with Heavily Damaged Spent Fuel from SFP of Unit 2 will be removed by the end of 2022. The amount of heavy metal (HM) in one fuel assembly is 110-112 kg.

Total inventory of Lithuanian Radioactive waste and SF are presented in IAEA SRIS database.

**Table 1: Example of a translation matrix that can be used for transition from a national classification system to international classification GSG-1**

National Waste Classification Name	VLLW	LLW	ILW	HLW
Class A	100 %			
Class B		100 %		
Class C		100 %		
Class D			100 %	
Class E			100 %	
Class F (DSRS)	30 %	30 %	40 %	

**Table 2a: Solid Radioactive Waste in Storage\***

Waste Class	Total Current Volume (m <sup>3</sup> )	Estimated Disposal Volume (m <sup>3</sup> )	Planned Disposal Route (if known)
Class A**	35000	50000	Engineered near surface (Landfill)
Class B	25000	40000	Engineered near surface
Class C			
Class D	4000	10000	DGR (Deep geological repository)
Class E			
Class F (DSRS)	15	100	Engineered near surface or DGR (Deep geological repository)
NORM	67	67	Landfill

**Note:**

\* total amount of waste estimated.

\*\* total amount of class A SRW after planned decontamination techniques. Without planned decontamination, the amounts of waste should be approximately three time higher (100.000 m<sup>3</sup>). Without contaminated concrete (amount of contaminated concrete from 50.000 up to 200.000 m<sup>3</sup>).

**Table 2b: Liquid Radioactive Waste in Storage**

Waste Class	Total Current Volume (m <sup>3</sup> )	Estimated Disposal Volume (m <sup>3</sup> )	Planned Disposal Route (if known) <sup>11</sup>
Class A	-	-	-
Class B and C* (Evaporated concentrates)	21000	14422	Engineered near surface for bituminized waste
Class B and C (sediments,	4300	30000	Engineered near surface

perlite, spent resins)			(disposal in same NSR with SRW)
Class D	-	-	-
Class E	-	-	-

**Note:**

\*Total amount of evaporated concentrates per NPP life circle are provided (only 2000 m<sup>3</sup> should be generated and treated in future (up to the end of NPP decommissioning) these amounts have not been generated yet) 19000 m<sup>3</sup> already treated and 14500 m<sup>3</sup> bitumen compound are prepared and placed in to the storage facility which will be transformed into the repository or retrieved. In case of retrieval amount of volume for disposal will be increase.

**Table 3a: Solid Radioactive Waste Disposed (as disposed volume)**

Waste Class	Estimated Disposal Volume (m <sup>3</sup> )	Disposal Route Used
Class A	0	Engineered near surface (Landfill)
Class B	0	Engineered near surface
Class C	0	
Class D	0	
Class E	0	DGR (Deep geological repository)
Class F (DSRS)	0	Engineered near surface or DGR (Deep geological repository)
<i>NORM</i>	0	

**Table 3b: Liquid Radioactive Waste Disposed (as disposed volume)**

Waste Class	Estimated Disposal Volume (m <sup>3</sup> )	Disposal Route Used
Class A	-	-
Class B and C* (Evaporated concentrates)	0	Engineered near surface for bituminized waste
Class B and C (sediments, perlite, spent resins)	0	Engineered near surface (disposal in the same NSR with SRW)
Class D	-	-
Class E	-	-

**Table 4: Spent fuel in Storage (tHM)**

Type	Current Amount (NPP)	Current Amount (Research Reactors and others)
Total Spent Fuel Storage	2415,952 tHM	-
Wet storage (AR)	about 2 201,952 tHM	-
Wet storage (AFR)	-	-
Dry storage (AR)	about 214,00 tHM	-
Dry storage (AFR)	-	-
Total spent fuel held in storage for other countries	-	-

AR = “at reactor site”, including fuel pools at NPP  
 AFR = “away from reactor site”

**Table 5: Spent fuel sent for reprocessing (in the country or sent to another country) (MTHM)**

Type	Amount (NPP)	Amount (Research Reactors and others)
Total amount of national Spent Fuel sent for reprocessing (in your country)	-	-
Total amount Spent Fuel sent to reprocessing (in another country)	-	-
Total amount of Spent Fuel received from another country for reprocessing	-	-
Total amount of spent fuel reprocessed in your country	-	-
Current reprocessing capacity in your country	-	-

**Part 6:**

**Tabulation of disposal facilities for waste and spent fuel, including their capacities and Status**

**Table 6: Summary of disposal facilities for radioactive waste and spent fuel**

Type	Planned	Construction commissioning	In Operation	Shutdown /closed	Other	Total
Spent Fuel disposal	1	0	0	0	0	1
Waste disposal: (multiple lines by country waste class)	2*	1	0			3

**Note**

\* It is planned to start construction of NSR in 2019 and to transform the bituminized LRW storage facility into repository. Project related to transformation of the existing bituminized LRW storage facility to repository is initiated and under development.

**Part 7:**

**Tabulation of major sources of waste**

**Table 7: Summary of major sources of waste**

Type	Planned (a)	Construction/ commissioning	In Operation	Permanent Shutdown	In Decommissioning (b)	Fully decommissioned	Total
Research reactors and others(c)	0	0	0	0	0	0	0
NPP reactors	0	0	0	0	2	0	2
Spent Fuel Reprocessing	0	0	0	0	0	0	0
Other (define)(d)	0	0	1*	0	0	0	1

Notes:

\* *Maišiagala facility contains institutional waste generated up to 1989. The plan for RADON type facility (at present a storage facility) is to retrieve and transport all waste to other facilities for storage and disposal.*

a) 'Planned' means under siting or licensing for construction

b) includes facilities in SAFSTOR status

c) research reactors and others with thermal rating > 1 MW

d) if applicable, where included in national inventory, e.g. decommissioning of contaminated facilities, clean up of accident related sites.

## Part 8:

### Future forecasts (volumes of waste and spent fuel arising, waste and spent fuel management facilities)

**Table 8: Forecasts (please provide data for 2030 and, if possible, for 2050)**

Type	Total Amount	Storage capacity (at reference date)	Estimated total amount when prepared for disposal*	Total disposal capacity (at reference date)	Total forecast at 2030	Total disposal Capacity in 2030	Total forecast at 2050	Total disposal Capacity in 2050
Spent Fuel Storage	2415,952 tHM	2700 tHM			2415,952 tHM		2415,952 tHM	
Total amount Spent Fuel sent to reprocessing (see foot note 17)	-				-		-	
Total amount Spent fuel disposed	2415,952 tHM			0	2415,952 tHM	0	2415,952 tHM	0
Waste in storage*:	90000 m <sup>3</sup> **		135000 m <sup>3</sup>		90000 m <sup>3</sup> **		90000 m <sup>3</sup> **	
Class A	35000 m <sup>3</sup>		40000 m <sup>3</sup>		35000 m <sup>3</sup>		35000 m <sup>3</sup>	
Class B and C	50000 m <sup>3</sup> ***		85000 m <sup>3</sup>		50000 m <sup>3</sup> ***		50000 m <sup>3</sup> ***	
Class D and E	4000 m <sup>3</sup>		10000 m <sup>3</sup>		4000 m <sup>3</sup>		4000 m <sup>3</sup>	
Class F	15 m <sup>3</sup>		100		100 m <sup>3</sup>		100 m <sup>3</sup>	
Waste disposal:	14417 m <sup>3</sup>			20000 m <sup>3</sup>	m <sup>3</sup>	150000 m <sup>3</sup>	m <sup>3</sup>	150000 m <sup>3</sup>
Class A	0 m <sup>3</sup>			0 m <sup>3</sup>	30000 m <sup>3</sup>	60000 m <sup>3</sup>	50000 m <sup>3</sup>	60000 m <sup>3</sup>
Class B and C	14417 m <sup>3</sup>			20000 m <sup>3</sup>	30000 m <sup>3</sup>	90000 m <sup>3</sup>	80000 m <sup>3</sup>	90000 m <sup>3</sup>
Class D and E	0 m <sup>3</sup>			0 m <sup>3</sup>	1000 m <sup>3</sup>	0 m <sup>3</sup>	10000 m <sup>3</sup>	0 m <sup>3</sup>
Class F****	0 m <sup>3</sup>			-	50 m <sup>3</sup>	0 m <sup>3</sup>	50 m <sup>3</sup>	-

\* *calculated equivalent amount when waste has been conditioned and packaged for disposal as per table of conversion factors given.*

\*\* *total amount of waste without contaminated concrete. Total estimated amount of concrete (mainly Class A) is from 50.000 m<sup>3</sup> up to 150.000 m<sup>3</sup> but different ways of it's release can be found (restricted usage, Landfill, disposal in the existing areas of compartments below ground level etc.)*

\*\*\* *LRW 21300 m<sup>3</sup> + 4300 m<sup>3</sup>, SRW 25000 m<sup>3</sup>.*

\*\*\*\* *Total amount of DSRS in Lithuania is approx. 90000 pcs of which 87 % are at Ignalina NPP, about 10 % in Maišiagala storage facility, which will be retrieved and transported to Ignalina NPP, and about 2-3 % are used in Lithuania outside of Ignalina NPP. Partially DSRS can be disposed in*

the near surface repository, in Landfill or free released (for DSRS below controlled levels of activities) all the remaining will be disposed in deep geological repository. The specific amounts are now at evaluation stage.

### Part 9: National strategy overview (optional)

A visual overview of the total national spent fuel and waste arising and the intended strategy for managing and disposing of it can be obtained through filling out the following overview table using the information that has been presented in the tables above.

Spent fuel and radioactive waste inventories, management strategies and disposal routes												
Country: _____		Reference										
date for inventory:												
SF/RW types (in national terms)	No strategy	SF reprocessing/ service		Disposal in:								
		home	abroad	UF-1		UF-2		NSF-1		NSF-2		Others
(A)	(B)	(C1)	(C2)	(D1)	(D2)	(E1)	(E2)	(F1)	(F2)	(G1)	(G2)	<input type="checkbox"/>
<b>1. SF (tHM)</b>												
<b>1.1. NPP</b>												
				2420								
<b>1.2. Other reactors</b>												
<b>2. HLW, [m<sup>3</sup>]</b>												
<b>3. A class, [m<sup>3</sup>]</b>		home							50000			
<b>4. B and C class, [m<sup>3</sup>]</b>		home						80000				
<b>5. D and E class, [m<sup>3</sup>]</b>		home		10000								
<b>6. F class, [m<sup>3</sup>]</b>		home		50				50				
Equivalence with IAEA GSG-1	2.											
	3.	home							VLLW			
	4.	home						LLW				
	5.	home		ILW								
	6.	home		DSRS				DSRS				

## REPORTING ARTICLE BY ARTICLE

### Article 4 – General principles

#### Article 4.1

Member States shall establish and maintain national policies on spent fuel and radioactive waste management. Without prejudice to Article 2(3), each Member State shall have ultimate responsibility for management of the spent fuel and radioactive waste generated.

#### National Policy

The National radioactive waste management policy is described in the Law on Radioactive Waste Management. The Law regulates social relations arising during the management of radioactive waste, and establishes the legal grounds for the management of radioactive waste. Radioactive waste management principles are indicated in the Article 3 of Law on Radioactive Waste Management, as a part of national radioactive waste management policy, and they state that management of radioactive waste must ensure that:

- 1) at all stages of the radioactive waste management, individuals, the society and the environment within Lithuania as well as beyond its borders, are adequately protected against radiological, biological, chemical and other hazards that may be associated with radioactive waste by applying appropriate methods;

- 2) efforts are made to prevent future generations from any reasonably predictable impact greater than those permitted for the current generation and to avoid any undue burden for future generations;
- 3) generation of radioactive waste is kept to the lowest practical minimum in terms of volume and activity, achieving this through measures during design, operation and decommissioning, including reprocessing and further use of nuclear fuel cycle materials.
- 4) interdependencies among all steps in the radioactive waste management are taken into account;
- 5) safety of radioactive waste and radioactive waste management facilities is guaranteed during management of radioactive waste and radioactive waste management facilities operating lifetime and thereafter, applying passive safety measures;
- 6) radioactive waste management safety measures shall be implemented by applying graded approach;
- 7) radioactive waste generated in the territory of the Republic of Lithuania shall be disposed of in disposal facilities in the territory of the Republic of Lithuania or transported for disposal to other country, except cases indicated in Article 24 (cases related to management of spent sealed sources).

The following articles describe other elements of the National Policy:

Article 9 of the Law on Radioactive Waste Management states: The radioactive waste generator shall cover all the expenses incurred during the management of radioactive waste from the moment of its generation to its emplacement at a disposal facility, including the expenses related to the post-closure surveillance of disposal facilities.

Article 24 part 2 of the Law on Radioactive Waste Management states: Sealed radioactive sources may be imported into the Republic of Lithuania if after their use it is intended to return them to the supplier of the sealed radioactive sources. The Recipient of a sealed radioactive source shall enter into a contract with the Radioactive Waste Manager on the management of the sealed radioactive source in case the sealed radioactive source cannot be returned to its supplier. The Recipient of a sealed radioactive source of ionising radiation shall obtain suretyship insurance in the amount specified in the contract with the Radioactive Waste Manager for the services, or to have a bank guarantee for the value of the service with the Radioactive Waste Manager, except in the cases stipulated in the legal act establishing the procedure for import to, export from, shipment in transit or transportation within the Republic of Lithuania of radioactive materials, radioactive waste and spent nuclear fuel and for issuance of permits (authorisations), such legal act being approved by the Head of the State Nuclear Power Safety Inspectorate jointly with the Minister of Health, where the contract is made in relation to the sealed source of ionising radiation which will be used and stored until it no longer requires control.

Article 25 of Law on Radioactive Waste Management states:

1. It shall be prohibited to import to the territory of the Republic of Lithuania radioactive waste and/or spent nuclear fuel, except for the cases where:

- 1) radioactive waste or spent nuclear fuel are shipped in transit via the territory of the Republic of Lithuania;
- 2) radioactive waste exported for treatment is being repatriated;
- 3) radioactive waste recovered from the exported materials is being repatriated;
- 4) radioactive waste produced after reprocessing of the exported spent nuclear fuel is being repatriated;
- 5) spent nuclear fuel exported for reprocessing is being repatriated, if the export was prohibited or the spent nuclear fuel has not been reprocessed.



Article 25 part 5 of the Law on Radioactive Waste Management states: Radioactive waste and/or spent nuclear fuel may be exported only to such countries that have the administrative and technical capabilities to receive it, as well as adequate regulatory and supervision institutions, also other structures required for radioactive waste and/or spent nuclear fuel management in accordance with the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Article 25 part 6 of the Law on Radioactive Waste Management states: It shall be prohibited to export radioactive waste from the territory of the Republic of Lithuania with an intent of emplacement at disposal sites lying south of 60 degrees latitude South.

Article 5 part 5 of the Law on Nuclear Energy states: It shall be prohibited to produce radioactive materials for a nuclear weapon or for fuel of nuclear power plants, also to reprocess already used elements of such fuel in the territory of the Republic of Lithuania.

According to Article 4 of the Law on Nuclear Energy nuclear and radiation safety in the Republic of Lithuania shall be guaranteed by the State.

According to Article 30 of the Law on Nuclear Energy the licence holder shall be responsible for the adequate and safe operation of the installation in accordance with the requirements stipulated in the laws and other legal acts, also in the articles of association, internal instructions and procedures of the licence holder. The licence holder shall be responsible for safety of its activities and the nuclear installation.

According to Article 16 of the Law on Nuclear Safety full liability for the nuclear safety of a nuclear installation and for nuclear safety in carrying out other activities with nuclear and/or nuclear fuel cycle materials shall solely fall on persons that are engaged in such activities and hold relevant licences and/or permits.

According to Article 12 of the Law on Radiation Protection, person may carry out practices in accordance the procedure on licensing of practices with sources of ionising radiation approved by the Government by registering practice included in the List of practices subject to registration specified in Annex 1 to the Law on Radiation Protection, or by getting licence or temporary permit to carry out practice in accordance with the types of licenses or temporary permits specified in paragraph 3 of Article 12 of the Law on Radiation Protection.

According to Article 31 of the Law on Radiation Protection and paragraphs 6 and 7 of part 2 of Article 22 of the Law on Nuclear Safety, radioactive waste may be transported inside, imported into, exported from and transit through the Republic of Lithuania only under the permit for shipment of radioactive waste issued by the Minister of Health or the State Nuclear Power Safety Inspectorate. Persons seeking to transport radioactive waste, when radioactive waste are intended to be transported inside, imported into or exported from and transit through the Republic of Lithuania, must be engaged in practice authorised in accordance with paragraph 3 of part 3 of Article 12 of the Law on Radiation Protection or paragraph 6 of part 1 of Article 22 of the Law on Nuclear Safety.

*Article 4.2*

*Where radioactive waste or spent fuel is shipped for processing or reprocessing to a Member State or a third country, the ultimate responsibility for the safe and responsible disposal of those materials, including any waste as a by-product, shall remain with the Member State or third country from which the radioactive material was shipped.*

Lithuania has never shipped radioactive waste or spent fuel to another country and no agreements to do so are signed between Lithuania and other country.

*Article 4.3*

*National policies shall be based on all of the following principles:*

- (a) the generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials;*
- (b) the interdependencies between all steps in spent fuel and radioactive waste generation and management shall be taken into account;*
- (c) spent fuel and radioactive waste shall be safely managed, including in the long term with passive safety features;*
- (d) implementation of measures shall follow a graded approach;*
- (e) the costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials;*
- (f) an evidence-based and documented decision-making process shall be applied with regard to all stages of the management of spent fuel and radioactive waste.*

Policy on nuclear safety and radiation protection is established in Article 3 and Article 9 of the Law on Radioactive Waste Management (ref. to answer on Article 4.1 of this Report). The Law on Nuclear Safety and the Law on Radiation Safety also maintain parts establishing policies of the radioactive waste management.

Development Programme and Implementation measures implements the national policy of radioactive waste management, which is mainly established in the Law on Radioactive Waste Management.

According to Article 22 of the Law on Nuclear Safety, licences and permits are established in order to be issued by VATESI (ref. to Article 5.1 (c) of this Report). Article 32 of the Law on Nuclear Safety and Rules of Procedure for Issuing Licences and Permits in the Area of Nuclear Energy, confirmed by Government decision No. 722, establishes the set of safety documentation which must be submitted for VATESI assessment before issuing an appropriate licence.

According to Article 30 of the Law on Nuclear Safety:

1. "...The assessment of nuclear safety shall be conducted as required at all the stages of a lifecycle of a nuclear installation...";
3. Analysis and substantiation of nuclear safety in the area of nuclear energy activities as well as other activities involving nuclear and/or nuclear fuel cycle materials shall be carried out by the applicant or the licence holder; whereas the analysis and substantiation of nuclear safety during the evaluation of the construction site of a nuclear power plant shall be carried out by the persons implementing a nuclear installation project. The results of the analysis and substantiation of nuclear safety shall be outlined in the documents evidencing nuclear safety, which shall be established according to the requirements of this Law and other legal acts. The results of the analysis and substantiation of nuclear safety shall be independently verified in the manner set out by the Head of VATESI. The applicant or the licence holder shall be responsible for the performance of such independent verification, whereas in case of the construction site of a nuclear power plant evaluation – the responsibility for performance of an independent verification falls on persons implementing the nuclear installation project design.

*Article 4.4*

*Except for the provisions set out in Article 2(3):*

- (a) repatriation of disused sealed sources to a supplier or manufacturer;*
  - (b) shipment of spent fuel of research reactors to a country where research reactor fuels are supplied or manufactured, taking into account applicable international agreements;*
  - (c) the waste and spent fuel of the existing Krško nuclear power plant, when it concerns shipments between Slovenia and Croatia.*
- Radioactive waste shall be disposed of in the Member State in which it was generated, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with*

*Article 16(2) of Directive 2006/117/Euratom, has entered into force between the Member State concerned and another Member State or a third country to use a disposal facility in one of them.*

*Prior to a shipment to a third country, the exporting Member State shall inform the Commission of the content of any such agreement and take reasonable measures to be assured that:*

*(a) the country of destination has concluded an agreement with the Community covering spent fuel and radioactive waste management or is a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ('the Joint Convention');*

*(b) the country of destination has radioactive waste management and disposal programmes with objectives representing a high level of safety equivalent to those established by this Directive; and*

*(c) the disposal facility in the country of destination is authorised for the radioactive waste to be shipped, is operating prior to the shipment, and is managed in accordance with the requirements set down in the radioactive waste management and disposal programme of that country of destination.*

According to the principles of radioactive waste management described in the Article 4.3 of this Report radioactive waste generated in the territory of the Republic of Lithuania shall be disposed of in disposal facilities within the territory of the Republic of Lithuania or transported for disposal to another country.

According Article 25 of the Law on Radioactive Waste Management:

2. Radioactive waste and/or spent nuclear fuel shall be imported to, exported from, shipped in transit and transported in compliance with the international treaties ratified by the Republic of Lithuania, laws and other legal acts regulating shipment of radioactive materials.

3. Economic entities of the Republic of Lithuania shall be allowed to export radioactive waste and/or spent nuclear fuel from the territory of the Republic of Lithuania and ship the same in transit via territories of other states only subject to a prior notification and consent of a competent regulatory authority of the state of destination obtained in a prescribed manner.

4. Radioactive waste and/or spent nuclear fuel may be transported by economic entities of the Republic of Lithuania through the transit countries only in compliance with requirements of international agreements and regulations which are relevant to the particular modes of transport.

5. Radioactive waste and/or spent nuclear fuel may be exported only to such countries that have the administrative and technical capabilities to receive it, as well as adequate regulatory and supervision institutions, also other structures required for radioactive waste and/or spent nuclear fuel management in accordance with the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

6. It shall be prohibited to export radioactive waste from the territory of the Republic of Lithuania with an intent of emplacement at disposal sites lying south of 60 degrees latitude South.

Lithuania has never shipped radioactive waste or spent fuel produced at INPP to another country and no agreements to do so are signed between Lithuania and other country.

## ***Article 5 – National framework***

### *Article 5.1*

*Member States shall establish and maintain a national legislative, regulatory and organisational framework ('national framework') for spent fuel and radioactive waste management that allocates responsibility and provides for coordination between relevant competent bodies. The national framework shall provide for all of the following:*

#### Article 5.1 (a)

A national programme for the implementation of spent fuel and radioactive waste management policy;

Amendments of 2014 in the Law on Nuclear Energy, the Law on Nuclear Safety and the Law on Radioactive Waste Management transpose requirements of the 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.

The content of the radioactive waste management development program (Article 12 of the Council Directive 2011/70/EURATOM) is defined by the Order of Minister of Energy No. 1-6 Procedure on the preparation of the radioactive waste management development program (2019). On the same time radioactive waste management development program is part of the national legal framework and is subject to the Law on Strategic Management and Methodology on Strategic Planning (approved Government resolution No. 292 (2021)). All development programs implements the tasks of the National Progress Plan. According to the Methodology on Strategic Planning, all national development programs should be contained in the two documents: development program approved by Resolution of the Government and implementation measures of the development program approved by the Order of the appropriate Minister. Development program should be very general document in which are identified the problems to be solved and the reasons for their occurrence, provided financial projections and sources of financing, program implementation measures with progress indicators. Implementation measures of the development program are detailed document in which are assessed and determined the intended impact of the measure, target group, expected change, activities needed to implement the measure, implementation area, established indicators of the implementation of the measure, detailed the required funds according to the sources of financing and clearly defined implementers of the measure. Taking in to account these requirements were prepared and approved Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (Development Programme) by the Government of Lithuania on February 3, 2021 by Resolution Nr. 76, and Implementation Measures of the Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (Implementation Measures) by the Order Nr 1- of the Minister of Energy on July x, 2021.

The Development Programme implements of the 2021–2030 National Progress Plan task 6.9 “To safely decommission nuclear power facilities and manage radioactive waste”. The Development Programme aims at a safe decommissioning of nuclear power facilities and management of all radioactive waste that has been and will be generated in Lithuania in order to protect people and the environment from the harmful effect of the ionizing radiation and not to leave an undeserved burden on future generations.

The Development Programme and Implementation Measures covers all radioactive waste management steps, including the preparatory steps to the final disposal site for spent nuclear fuel. Six Implementation Measures are identified in the Development Programme:

- 1) to dismantle nuclear power facilities;
- 2) to conduct the primary treatment of radioactive waste;
- 3) to conduct basic and final treatment of radioactive waste and ensure the storage of all radioactive waste;
- 4) to conduct final disposal of very low-, low- and intermediate-level radioactive waste;
- 5) to conduct final disposal of long-lived radioactive waste;
- 6) to create a management model of the radioactive waste generated by small radioactive waste producers after 2038.

The Ministry of Energy coordinates and monitors the implementation of the Development Programme and Implementation Measures. At the end of each quarter, the Ministry of Energy provides general information about implementation and progress of the Development Programme and Implementation Measures into electronic State Monitoring Information System. The Ministry of Energy provides detailed information about implementation and progress of the Development Programme and Implementation Measures in the previous year at the beginning of the current year into electronic State Monitoring Information System.

The Development Programme are adopted for a 10-year period. This period coincides with the National Progress Plan period. The Development Program might be reviewed sooner if necessary.

Institutions, which are involved into implementation of the Development Programme and Implementation Measures, prepare their own programs and plans: State Enterprise Ignalina Nuclear Power Plant Annual Operating Plan, Annual Strategic Activity Plan of the Ministry of Energy.

Article 5.1 (b)

National arrangements for the safety of spent fuel and radioactive waste management. The determination of how those arrangements are to be adopted and through which instrument they are to be applied rests within the competence of the Member States;

Lithuania has established appropriate legislative and regulatory framework in order to govern safety of spent fuel and radioactive waste management.

All the legal acts concerning spent fuel and radioactive waste management are prepared according to the best in country and international practice including IAEA recommendations and WENRA safety levels and objectives. It covers all areas of spent fuel and radioactive waste predisposal management and disposal of very low-level waste and disposal of low and intermediate level waste.

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 is fully transposed to the national legal acts.

The list of main legal acts regulating the management of spent nuclear fuel and radioactive waste in Lithuania is presented below:

**Laws:**

1. Law on the Management of Radioactive Waste (1999, last amended 2021);
2. Law on Nuclear Energy (1996, last amended 2021);
3. Law on Nuclear Safety (2011, last amended 2021);
4. Law on Radiation Protection (1999, last amended 2021);
5. Law on the Ratification of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (2003);
6. Law on Environmental Impact Assessment (1996, last amended 2021);

**Government Resolutions:**

7. Government Resolution No. 76 On Approval of the Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (2021) ;
8. Government Resolution No. 722 On Approval of Rules of Procedure for Issuing Licenses and Permits in the Area of Nuclear Energy (2021);
9. Government Resolution No. 918 On Approval of Rules on Authorization of Practices with Sources of Ionizing Radiation (1999, last amended 2021);
10. Government Resolution No. 918 On Approval of Rules on the Handling of Orphan Radioactive Sources (2005, last amended 2021);
11. Government Resolution No. 651 On the Establishment of the State Register of Radiation Sources and Exposure to Workers and Approval of Its Statute (1999, amended 2018);
12. Governmental Resolution No. 461 On Approval of the Regulation on Providing of Data Concerning Activities Related with the Disposal of Radioactive Waste to the Commission of the European Communities (2007, amended 2012);
13. Government Resolution No. 1165 On Approval of the Rules for Issuing of Permits for Construction, Reconstruction, Major Repair or Demolition of Nuclear Facility (2002, last amended 2016);
14. Government Resolution No. 1873 On Approval of the Procedure for Agreement of Project for Construction or Reconstruction of Nuclear Facility (2002, last amended 2016).

### **General requirements:**

15. Nuclear Safety Requirements BSR-3.1.2-2017, Regulation on the Pre-disposal Management of Radioactive Waste at the Nuclear Facilities (2020).
16. Nuclear Safety Requirements BSR-3.1.1-2016, The General Requirements for Dry Type Storage for Spent Nuclear Fuel (2020);
17. Nuclear Safety Requirements BSR-3.2.2-2016, Radioactive Waste Repositories (2020);
18. Nuclear Safety Requirements BSR-3.2.1-2015 Radioactive Waste Acceptance Criteria for Near Surface Disposal Facilities (2019);
19. Nuclear Safety Requirements BSR-1.4.1-2016, Management Systems (2020);
20. Nuclear Safety Requirements BSR-1.4.4-2019, The Requirements on the Operational Experience Feedback in the field of Nuclear Energy (2019);
21. Nuclear Safety Requirements BSR-1.8.2-2015 Categories of Modifications of Nuclear Installations and Procedure of Performing the Modifications (2020);
22. Nuclear Safety Requirements BSR-2.1.2-2010 Basic Safety Requirements for Nuclear Power Plants with RBMK-1500 Reactors (2020);
23. Nuclear Safety Requirements BSR-1.5.1-2015 Requirements for the Decommissioning of Nuclear Facilities (2021);
24. Nuclear Safety Requirements BSR-1.1.3-2016 „VATESI Inspections“ (2020);
25. Nuclear Safety Requirements BSR-1.1.4-2011 “Rules of Procedure for Applying the Enforcement Measures Set by VATESI“ (2011, amended in 2020);
26. Order of the Minister of Health and the Head of the State Nuclear Power Safety Inspectorate No. V-1271/22.3-139 On the Rules on import, export, transit and transport of radioactive material, radioactive waste and spent nuclear fuel (2008, last amended 2019);
27. Order of the Minister of Health No. V-712 On Regulations of Decommissioning of the Objects in which Practices Involving Sources of Ionizing Radiation Were Executed (2003, last amended 2020);
28. Order of the Minister of Environment No. D1-546 “On Approval of Regulation of Environmental Monitoring of Economic Entities” (2009, last amended 2021);
29. Order of the Minister of Health No. V-687 “On Approval of Rules of Physical Protection of Radioactive Source, except practices with radioactive sources in nuclear energy field” (2005, last amended 2021).

### **Radiation protection requirements:**

30. Nuclear Safety Requirements BSR-1.9.3-2016 “Radiation Protection at Nuclear Facilities” (2019);
31. Lithuanian Hygiene Standard HN 73:2018 "Basic Standards of Radiation Protection" (2001, last amended 2018);
32. Lithuanian Hygiene Standard HN 99:2019 “Protective Actions of Public in Case of Radiological or Nuclear Accident” (2020);
33. Lithuanian Hygiene Standard HN 89:2001 "Management of Radioactive Waste" (2001) (for small radioactive waste producers);
34. Nuclear Safety Requirements BSR-1.9.2-2018 “Derivation and Use of Clearance Levels of Radionuclides for Materials and Waste Generated during Activities in the Area of Nuclear Energy” (2011, last amended 2020);
35. Nuclear Safety Requirements BSR-1.9.1-2017 „Limits of Radioactive Discharges into Environment from Nuclear Facilities and Requirements for a Plan for Radioactive Discharges into Environment” (2018).

Lithuania has signed Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management on 30 September 1997 and ratified it on 18 December 2003. This

Convention entered in force in Lithuania on 14 June 2004. In 2020, Lithuania prepared sixth Lithuanian National Report on Compliance with Obligations under the Joint Convention.

The basic provisions for the management of spent nuclear fuel and radioactive waste are given in the Law on the Management of Radioactive Waste. This Law defines principles of radioactive waste management, competence of the authorities, duties and responsibilities of the waste generator, duties and responsibilities of radioactive waste manager and provisions for licensing.

The basic radiation protection and safety requirements, corresponding to IAEA recommendations and requirements of the legal acts of the European Union, also allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management are established in the Law on Nuclear Energy, the Law on Nuclear Safety and the Law on Radiation Protection.

Article 5.1(c)

a system of licensing of spent fuel and radioactive waste management activities, facilities or both, including the prohibition of spent fuel or radioactive waste management activities, of the operation of a spent fuel or radioactive waste management facility without a licence or both and, if appropriate, prescribing conditions for further management of the activity, facility or both;

The Law on Nuclear Energy and the Law on Nuclear Safety together with the regulations made under other laws establish the licensing system for activities related to nuclear materials or nuclear cycle materials (their transportation, acquisition, etc.), as well as for nuclear facilities of the following life-stages: site evaluation, design, construction, commissioning, operation, and decommissioning. The supervision of the closed radioactive waste repository, acquisition, keeping, use and transportation of nuclear or nuclear fuel cycle materials is also executed according to the laws mentioned above. This regulation should encompass the following areas:

- nuclear safety, radiation safety and physical security of nuclear facilities, nuclear and nuclear fuel cycle materials;
- fire protection of safety related structures, systems and components;
- emergency preparedness in nuclear facilities and during transportation of nuclear and/or nuclear fuel cycle materials;
- radioactive waste management safety;
- the release of radionuclides into the environment;
- management systems of legal entities engaged in a licensed activity and other activities involving nuclear and nuclear fuel cycle materials or carried out in nuclear facility as well as assessment of the nuclear facility construction site.

According to the Law on Nuclear Energy, the concept of nuclear facility includes:

- nuclear power plant,
- unit of nuclear power plant,
- non-power nuclear reactor,
- storage facility for nuclear materials,
- storage facility for radioactive waste,
- radioactive waste processing facility,
- radioactive waste disposal facility.

VATESI is a competent authority for the licensing of activities involving nuclear materials or nuclear cycle materials as well as activities carried out in nuclear facilities within the legally defined life-stages of nuclear facilities.

During the stage of site evaluation, VATESI shall review and assess the site evaluation report. The positive conclusions in respect of the site evaluation report shall be presented by the following institutions: the Ministry of Health, the Civil Aviation Administration, the Lithuanian Geological Survey, the Lithuanian Hydro Meteorological Service and the Fire Prevention and Rescue Department, in order to approve it. Before the design activities start, technical specification for design

has to be approved by VATESI. Design of a nuclear facility has to be performed and assessed according to the requirements established by the competent institutions, including VATESI, Ministry of Environment, Ministry of Health, Ministry of Interior and other institutions involved according to the Law on Construction, the Law on Nuclear Energy and the regulations made under the Laws.

According to Article 22 of the Law on Nuclear Safety, the following types of licences and permits are established in order to be issued by VATESI:

- licence for construction of a nuclear facility (or facilities);
- licence for operation of a nuclear facility (or facilities);
- licence for construction and operation of a nuclear facility (or facilities);
- licence for decommissioning of a nuclear facility (or facilities);
- licence for supervision of a closed radioactive waste repository (or repositories);
- licence for transportation of nuclear fuel cycle materials, nuclear materials and other fissile materials with exception of the small amount as described in the Law;
- licence for acquisition, keeping and use of nuclear materials and other fissile materials with exception of the small amount as prescribed in the Law;
- permit for first carry-in of nuclear fuel to site of nuclear power plant, unit or non-power nuclear reactor;
- permit for the first carry-in and testing of the nuclear facility using nuclear and/or nuclear fuel cycle materials;
- permit for first start-up of unit of nuclear power plant or non-power nuclear reactor;
- permit for industrial operation of the nuclear facility;
- permit for start-up of the nuclear reactor after its short-term shutdown;
- permit for shipment of radioactive waste generated in nuclear fuel cycle;
- permit for shipment of spent nuclear fuel;
- permit for start decommissioning works.

Following the provisions of the Law on Radiation Protection VATESI issues licences and temporary permits for activities with the sources of ionising radiation in the nuclear energy area, which mainly are licences or temporary permits to carry out activities under ionising radiation at the nuclear facility and licences or temporary permits to store, maintain and use sources of ionising radiation at a nuclear facility.

A licence for the construction of a nuclear facility may be granted only if the Parliament of Lithuania (in case of NPP) or the Government of Lithuania (in case of other facilities) has adopted a legal act on the facility.

As stipulated in the Law on Nuclear Safety, licences and permits shall be issued to legal entities or persons which have sufficient technological, financial, management system, human, emergency preparedness, physical security capacities, capacities of safe storage, transportation, accounting for and control of nuclear materials meeting the provisions of IAEA and EURATOM for safeguard, allowing proper fulfilment of the conditions of the licensed activity and ensuring nuclear safety.

Lists of information and documents that applicant is required to provide for the issue of an appropriate licence or permit are established by the Resolution of the Government of Lithuania.

RPC is responsible for issuing a license or temporary permit for the radioactive waste management (pre-treatment, treatment, conditioning and storage of radioactive wastes) for small radioactive waste producers (waste producer with the exception of the operator of a nuclear plant). On purpose to carry out the single shipment of radioactive waste of small radioactive waste producers, in addition to the licence, the permit for shipment radioactive waste is needed, which is issued by the RPC.

According to the Article 24, para. 1, 2 and 3 of the Law on the Management of Radioactive Waste, sealed sources might be imported into Lithuania, only if after their useful life it is planned to return them back to supplier. In addition, the recipient must make a contract with Radioactive Waste Manager for the management of radioactive sources for cases, if due to unforeseen circumstances



there are no possibilities to return them back to supplier, and to insure for the value of Radioactive Waste Manager services or to have a bank guarantee for the value of the service with the Radioactive Waste Manager. In authorization process (for small radioactive waste producers), agreement with Radioactive Waste Manager and insurance or bank guarantee for the value of the Radioactive Waste Manager services is required before licence to use the radioactive source will be granted or practice to use radioactive sources will be registered.

RPC does not take part in the licensing of SF and radioactive waste management activities at the nuclear plants and centralized radioactive waste management facilities, however RPC takes part in evaluation of the EIA of the activities of nuclear facilities in regard of radiological impact to the public health.

According to the Law on Nuclear Energy, the Law on the Management of Radioactive Waste and the Law on Radiation Protection it is prohibited to carry out any activity, related to the radioactive waste management and SF in Lithuania, without a licence. Otherwise, the measures of enforcement described in the Article 5.1e of this Report will be implemented.

Article 5.1(d)

a system of appropriate control, a management system, regulatory inspections, documentation and reporting obligations for radioactive waste and spent fuel management activities, facilities or both, including appropriate measures for the post-closure periods of disposal facilities

According to the Article 28 of the Law on Nuclear Safety VATESI shall supervise the performance of licensed or permitted activities, and shall evaluate safety of nuclear facilities as well as safety of operations with nuclear and/or nuclear fuel cycle materials by conducting inspections.

VATESI regulatory inspections are conducted at all stages of the lifetime of a nuclear facility: during the evaluation of a construction site for a nuclear facility, its design, construction, commissioning, operation or decommissioning stages, as well as in oversight of the closed radioactive waste repository, procuring, storing or transporting nuclear and / or nuclear fuel cycle materials and /or dual use nuclear commodities. VATESI inspects applicants for obtaining licences and permits, license and permit holders, suppliers of goods or contractors performing works and other companies performing operations related to nuclear or nuclear fuel cycle materials. While performing inspection activities, it is critically important to assess the current situation in the nuclear power sector, to identify priority areas in terms of ionizing radiation hazard so that the safety related issues would be given proper attention. Every year VATESI develops a plan of inspections in accordance with the established criteria and with regard to the available human and financial resources. In addition to planned inspections unplanned inspections which may be announced or unannounced are performed as well. VATESI areas of inspections are: nuclear safety, radiation protection, physical security, control over dual use nuclear commodities and accounting of and control over nuclear materials. VATESI conducts inspection according Nuclear Safety requirements BSR-1.1.3-2016 „VATESI Inspections“ and VATESI quality management document “The Procedure for Inspections”.

Law on Nuclear Safety, Nuclear Safety Requirements BSR-3.1.2-2017 “Regulation on the Pre-disposal Management of Radioactive Waste at the Nuclear Facilities”, Nuclear Safety Requirements BSR-3.1.1-2016 “The General Requirements for Dry Type Storage for Spent Nuclear Fuel” and Nuclear Safety Requirements BSR-3.2.2-2016 “Radioactive Waste Repositories” requires that licence holder shall provide annual reports on the activities with radioactive waste or spent nuclear fuel. According to the mentioned nuclear safety requirements, all the activities with radioactive waste and spent fuel shall be documented.

Pursuant to provisions of the Law on the Management of Radioactive Waste and the Law on Radiation Protection, the RPC is in charge of state supervision for management of radioactive waste generated by small radioactive waste producers (institutional radioactive waste). As regards the inspection order and frequency, they are outlined in the Regulation for Radiation Protection State Supervision (2009, last amended 2016). Detailed inspection procedures (including inspection

questionnaires and forms of inspection protocols) are established and approved by the Director of the RPC.

Article 5.1(e)

enforcement actions, including the suspension of activities and the modification, expiration or revocation of a licence together with requirements, if appropriate, for alternative solutions that lead to improved safety;

In performing the state regulatory and supervision functions of nuclear safety, pursuant to Article 11 Paragraph 2 of the Law on Nuclear Safety, VATESI applies enforcement measures in the manner set out by the Law on Nuclear Safety and other legal acts, requires relevant persons to implement corrective measures and (or) to eliminate the violations, and supervises the implementation of such requirements.

Enforcement measures are being applied in accordance with legal principal of graded approach. All enforcement measures, which are used by VATESI, are arranged progressively considering the character of violation.

VATESI is empowered to impose following administrative enforcement measures according to the Law on Nuclear Safety and other laws:

- to provide mandatory requirements to licence or permit holders, committing them to eliminate the detected violations, to suspend the works within the time-limits set by the Head of VATESI and/or to shut-down the nuclear reactor, to decrease its capacity, to discontinue operation of other equipment or activities according to Law on Nuclear Safety;
- to impose administrative fines on natural persons according to Code of Administrative Offences of the Republic of Lithuania;
- to impose fines on legal entities according to the Law on Nuclear Safety (otherwise known as economic sanctions).

Pursuant to the Article 6 of the Law on Nuclear Safety mandatory requirements are imposed on the legal entity in any of below listed cases:

- After the issuance of a licence or a permit it emerges that the information provided in the application and in other submitted documents was false;
- The licence or permit holder breaches the requirements of the legal acts;
- The licence or permit holder does not longer meet the requirements which it had met at the moment of issuance of the licence or permit;
- operation parameters of the equipment of the nuclear facility do not comply with the permissible limits specified in the normative technical documents, design documentation of the nuclear facility or the operating documents of licensee or permit holder;
- operation of the nuclear facility does not correspond to the safe operating conditions specified in the normative technical documents, design documentation of the nuclear facility or the operating documents of licensee or permit holder;
- the properties of the structures, systems and components of the nuclear facility that are important for safety are not or may not comply with the design of the nuclear facility;
- actions or inactions of the operator that may lead to breach confinement barriers for radionuclides;
- actions or inactions of the operator that may lead to release of radionuclides into the environment exceeding the limits set in the plan of radionuclides release into the environment;
- the actions or inactions of the operator, when doses of radiation exposure to workers may exceed the limits set by the Minister of Health;
- violation that may cause or lead to international sanctions.

The Head of VATESI issues mandatory requirements as soon as the nuclear safety violations are detected in the activities of the licence or permit holder, taking into account the requirements for nuclear safety set by the Law on Nuclear Safety and other legal acts, as well as adhering to the nuclear

safety requirements, the nuclear safety rules, the standards and the terms and conditions of the licence or permit. The type of mandatory requirements and their extent, on a case-by-case basis, have to be established upon evaluation of eventual threats, their impact on, scope of, and risk to residents, their property and the environment. The mandatory requirements have to base on proportionality, justice, rationality and fairness.

VATESI is also empowered to take the following actions related to the issued licences and permits:

- warn the legal entity about suspending of the license, permit;
- suspend the license, permit;
- revoke the license, permit.

According to the Law on Radiation Protection and the Law on the Management of Radioactive Waste, licences to small producers for the activities related to radioactive waste management (to collect, sort radioactive waste, to undertake its treatment, to store, reprocess, transport and decontaminate it) are issued, the radiation protection state supervision is carried out, and in case if requirements are violated, administrative penalties (according the Code of Administrative Violations) are applied by the RPC. The licences issued by RPC also can be suspended or revoked in case of violations of requirements.

Article 5.1(f)

(f) the allocation of responsibility to the bodies involved in the different steps of spent fuel and radioactive waste management; in particular, the national framework shall give primary responsibility for the spent fuel and radioactive waste to their generators or, under specific circumstances, to a licence holder to whom this responsibility has been entrusted by competent bodies;

Article 3 of the Law on Nuclear Safety stipulates: The full responsibility for ensuring nuclear safety shall fall on the persons in charge of the nuclear installation or the activities posing a risk of exposure to ionising radiation.

Article 30 of the Law on Nuclear Energy stipulates: The licence holder shall be responsible for the adequate and safe operation of the installation in accordance with the requirements stipulated in the laws and other legal acts as well as in the articles of association, internal work rules of the licence holder and in the terms of the issued licence. The licence holder shall be responsible for safety of its activities and the nuclear installation.

Small producers (generators) are responsible for all steps radioactive waste management according to the Law on the Management of Radioactive Waste:

Article 9 of the Law on the Management of Radioactive Waste stipulates:

1. It shall be the duty of a radioactive waste generator (small producers included) to manage, in accordance with the requirements established by legal acts, radioactive waste until transferring it to a radioactive waste manager (which is licensed by VATESI).
2. The radioactive waste generator shall pay all the expenses incurred during the management of radioactive waste from the moment of its generation to its emplacement at a disposal facility, including the expenses related to the post-closure surveillance of disposal facilities.
3. The radioactive waste generator shall not be exempt from the duties and responsibilities to manage radioactive waste safely even in the event of a temporary suspension or cancellation of the licence.

Article 5.1(g)

national requirements for public information and participation

VATESI and the licence holders must inform both the state and municipal institutions and the general public as well as other persons whose business activities are directly related to the licensed activities of a relevant licence holder about the conditions of nuclear safety, in the manner required under the

Law on Provision of Information to the Public of the Republic of Lithuania and other legal acts. The organizations operating nuclear installations also must inform general public about the measures that are foreseen in the emergency preparedness plans which may have an impact on regular living conditions. VATESI has to deliver public announcements on the results of supervision the implementation of nuclear safety requirements. While implementing its supervision functions VATESI provides confirmed written and/or public consultations to the legal entities that submitted written requests and/or questions or provides public consultations on its own initiative.

The main means of ensuring the transparency of the decisions:

- draft legal documents are public in order to inform and get a response (suggestions, remarks, comments) from interested parties;
- consultations and meetings are organized on different issues with interested parties;
- regular public announcements on the information about the condition of nuclear safety in Republic of Lithuania are announced;

Information on nuclear safety is prepared and disseminated using these methods:

- reports on conventions and other legal acts of Lithuania, EU, international institutions;
- VATESI annual reports (Nuclear Power Safety in Lithuania) and annual reports to The President and the Government in terms of its activities and finances;
- VATESI website, press releases and other publications;
- possibility for students from universities to visit VATESI.

Pursuant to Article 39<sup>1</sup> of Law on Nuclear Safety the public, as defined in this article, as one or more person and/or juridical persons, their associations, organizations or groups, can participate in the adoption of the following decisions in the field of nuclear energy: evaluation of site, construction, operating, decommissioning and post-closure surveillance of disposal facilities. Pursuant to Paragraph 2 of Article 42 of Law on Nuclear Safety, not less frequently than once per year the holder of a licence shall be required to publicly announce the information about the nuclear safety condition of a relevant installation.

More details on public information can be found in Article 10 Transparency.

Information on public participation is provided in Article 10.2 of this Report.

Article 5.1(h)

the financing scheme(s) for spent fuel and radioactive waste management in accordance with Article 9.

In general, according to the Law on Radioactive Waste Management Article 9, the radioactive waste generator shall pay all the expenses incurred during the management of radioactive waste from the moment of its generation to its emplacement at a disposal facility, including the expenses related to the post-closure surveillance of disposal facilities. Taking into account that in Lithuania main producer of the radioactive waste is Ignalina Nuclear Power Plant (more than 99 %) and institutional waste producers produce only 1-2 m<sup>3</sup> of radioactive waste annually, financing schemes for the management of this radioactive waste are separate and different:

1. Financing scheme for the management of spent fuel and radioactive waste from INPP are described in the Revised Final Decommissioning Plan of Ignalina NPP (FDP). FDP was approved by the Ministry of Energy on 25 August 2020. There are several financing sources for the management of radioactive waste and spent fuel of INPP: Ignalina Programme, State budget, Ignalina International Decommissioning Support Fund. New radioactive waste management facilities, which are or will be built as part of the INPP decommissioning process, such as solid radioactive waste management and storage facility, interim spent nuclear fuel storage facility, landfill and near surface disposal facilities and others, are being financed by the Ignalina International Decommissioning Support Fund, Ignalina Programme and co-financed by State budget.

2. Institutional waste producers pay for their waste collection, transportation, treatment, and storage and disposal services according to contracts with State Enterprise Ignalina Nuclear Power Plant. The fees for these services were approved by the Order of the Minister of Energy No. 1-303 On the State Enterprise Ignalina Nuclear Power Plant for the Management of Radioactive Waste. Mandatory revisions of the fees are carried out once in two years. INPP collects fees from the institutional waste producers into a separate dedicated account. Management of historical institutional waste (collected before 2003) is funded from the state budget.

3. Specific attention given to the management of spent sealed sources. Article 24 of the Law on Radioactive Waste Management states, that in the case of import of sealed sources into Lithuania, it is obligatory to obtain a written commitment from the source provider to return the sealed source after its disuse and make a contract with Radioactive Waste Manager (currently State Enterprise Ignalina NPP) for the management of radioactive source in a case, if due to unforeseen circumstances there are no possibilities to return them back to supplier, and to insure for amount of Radioactive waste manager services or to have bank guarantee.

4. According Law on Radioactive Waste Management Article 9, management of the orphan sources is funded from the state budget or municipal budget.

5. In 2020 the Seimas of the Republic of Lithuania (Parliament) approved a financing mechanism for the final disposal (deep geological repository) of spent nuclear fuel and high level radioactive waste. By the Resolution of the Seimas of the Republic of Lithuania were amended provisions of the Reserve Fund, according to which Lithuania annually allocates at least 3 million euros to the separate account of the Reserve Fund (dedicated for collecting funds for deep geological repository).

*Article 5.2*

*Member States shall ensure that the national framework is improved where appropriate, taking into account operating experience, insights gained from the decision-making process referred to in Article 4(3)(f), and the development of relevant technology and research.*

One of fundamental principles set in the Article 3 of the Law on Nuclear Safety is the principle of state regulation of nuclear safety, which requires to develop and maintain an effective legal framework and a public management structure (national framework) involving an independent state regulation of the activities in the area of nuclear energy. The mandate to create, maintain and improve the state regulatory and supervision system for nuclear safety, including preparation of relevant nuclear safety requirements and rules, is given to VATESI by the Article 11, Paragraph 1 of the Law on Nuclear Safety and by Statute of VATESI.

Drafting of new and revision of the approved regulations, including relevant Laws and Governmental documents, is performed in accordance with Nuclear Safety Requirements BSR- 1.1.1-2014 “Rules of Procedure for Drafting of Nuclear Safety Requirements and Nuclear Safety Rules“ and VATESI internal procedure. According to BSR-1.1.1-2014 5-year program (program for development of technical-normative documents) and annual plan for drafting of new regulations and revision of approved is established. When drafting nuclear safety requirements and rules, operating experience of Lithuanian nuclear facilities, advanced international practice and advanced practice of foreign countries, recommendations of IAEA, WENRA and other international organizations or institutions shall be taken into account.

According to the Law on Radiation Protection, RPC, in accordance with the order established by laws, participates in developing and implementing state policy in the area of radiation protection, and prepares the draft legal acts related to radiation protection issues. The draft legal acts or proposals for their amendments are prepared according to annual plan of activities of the RPC, taking into account operating and supervision experience, development of relevant technology and research, legal acts of

the European Union, international practices, recommendations of IAEA and other international organizations (ICRP, HERCA), harmonization with other national legal acts.

In the Article 5 part 6 in the Law on the Management of Radioactive Waste is established duty to the Ministry of Energy to organize continuous improvement of the legal and regulatory framework related to the management of RAW. In 2017 by the Order of the Minister of Energy, the Working Group (consisted of the representatives from the Ministry of Energy, Ministry of Environment, VATESI, RPC, INPP, and LGS on the monitoring of the SF and RAW management was established and the work on the improvement of the legal and regulatory framework has started.

## ***Article 6 - Competent regulatory authority***

### *Article 6.1*

*Each Member State shall establish and maintain a competent regulatory authority in the field of safety of spent fuel and radioactive waste management.*

### *Article 6.2*

*Member States shall ensure that the competent regulatory authority is functionally separate from any other body or organisation concerned with the promotion or utilisation of nuclear energy or radioactive material, including electricity production and radioisotope applications, or with the management of spent fuel and radioactive waste, in order to ensure effective independence from undue influence on its regulatory function.*

### *Article 6.3*

*Member States shall ensure that the competent regulatory authority is given the legal powers and human and financial resources necessary to fulfil its obligations in connection with the national framework as described in Article 5(1) (b), (c), (d) and (e).*

## ***Competent regulatory authority***

### ***VATESI***

State Nuclear Power Safety Inspectorate (VATESI) is state regulatory and supervisory authority in Lithuania for activities involving nuclear materials and other activities in the area of nuclear energy involving sources of ionizing radiation. VATESI sets safety requirements and regulations, supervises compliance with them (incl. inspections), applies enforcement measures in case of incompliance with safety requirements and regulations, issues licenses, permits and temporary permits, assess safety of nuclear facilities.

The mission of VATESI is to exercise the state regulation of, and supervise over the nuclear installations and the activities related to nuclear and nuclear fuel cycle materials, in order to protect the society and the environment against the harmful impact of exposure to ionising radiation.

The main tasks of VATESI are regulation and supervision of nuclear safety, radiation safety of nuclear energy activities involving sources of ionizing radiation, physical security of nuclear installations, nuclear materials and/or nuclear fuel cycle materials and accountancy and control of nuclear materials as well as supervision of requirements arising from international nuclear weapon non-proliferation obligations of Republic of Lithuania.

According to the Law on Nuclear Energy VATESI performs the following functions:

- exercises functions of the state regulation and supervision of nuclear safety, physical security of nuclear installations, nuclear materials and the nuclear fuel cycle materials, accounting for and control of the nuclear materials, also of radiation safety in operating nuclear installations;
- monitors the compliance with the requirements set forth by the legal acts for activities in the area of nuclear energy subject to licences or permits and monitors exercising of the rights and obligations of licence holders and/or permit holders;

- drafts and approves the requirements and rules for nuclear safety, radiation safety in the area of nuclear energy, accounting for and control of the nuclear materials, physical security of nuclear materials and the nuclear fuel cycle materials mandatory to all the state and municipal authorities, also to all the persons engaged in such activities;
- supervises the compliance with requirements of the legal acts regulating nuclear safety, radiation safety in the area of nuclear energy, physical security of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of the nuclear materials;
- analyses and assesses the documents submitted by applicants for obtaining a licence or a permit, also the documents submitted by licence holders or permit holders or other persons, adopt relevant decisions regarding such documents, review and evaluate the nuclear safety;
- supervises and inspects applicants, licence and permit holders or the persons rendering services, supplying goods or performing works for them or other persons engaged in activities pertaining to nuclear materials and nuclear fuel cycle materials;
- in the cases specified in the laws and other legal acts issue, suspends licences and permits, revokes suspension of licences and permits, or cancels licences and permits, establishes or changes their terms, supervises compliance with such terms;
- subject to coordination with the Ministry of Health establishes norms for release of radionuclides from nuclear installations and monitors compliance with the norms for release of radionuclides;
- drafts and approves the modification categories of a nuclear installation and a description of the procedure for carrying out modifications;
- cooperates with foreign institutions exercising state regulation and supervision in the sector of nuclear energy, within its competence participate in activities of international organisations and institutions, committees and groups of the European Union;
- within its competence and in accordance of legal acts prepares and/or submits to the Government the draft laws and legal acts of the Republic of Lithuania on the issues of nuclear safety, physical security of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of nuclear materials, also of radiation safety in carrying out nuclear energy related activities involving sources of ionising radiation;
- prepares and submits to the Government or its authorised institution proposals regarding the national policy and strategy in the sector of nuclear energy and implementation thereof;
- prepares and submits to the Government or its authorised institutions proposals regarding improvements of the system ensuring nuclear safety, radiation safety in the area of nuclear energy, physical security of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of nuclear materials;
- in the event of a nuclear and/or radiological accident provides the interested state and municipal authorities with the time-critical information about the radiation situation in the nuclear installation, estimated threats of the nuclear and/or radiological accident and other related information.

### ***Independence of regulatory authority***

National legislation provides clear division between the responsibilities and functions of VATESI and those organizations or bodies engaged in development/promotion of the nuclear energy or use of nuclear energy, including production of electricity.

Paragraph 3 of the Article 23 of the Law on Nuclear Energy states, that VATESI has a power to take decisions independently in carrying out its statutory functions. To address nuclear safety issues, functions are clearly divided between the operating and regulatory institutions. VATESI acts as independent governmental institution subordinated directly to the Cabinet of Government and the President, hence its place in the governmental structure helps to assure an effective separation of the regulatory body from the institutions responsible for promotion of nuclear energy. Pursuant to Paragraph 10 of the Article 23 of the Law on Nuclear Energy, the Head and Deputy Heads of VATESI

in their official capacity shall act independently from the persons engaged in activities in the field of the nuclear energy sector, also from other agencies, institutions or organisations engaged in expansion of the nuclear energy or use of nuclear energy, including generation of electricity. Independent activities imply a prohibition to be a member of a body of a legal entity, to accept other remunerated or public positions, to provide services or consultations, except the ones provided acting in the official capacity at VATESI, or to be engaged in other activities due to which a certain person, other agency, institution or organisation acting in the nuclear energy sector would or might gain unjustified competitive advantage over the persons engaged in relevant activities. A breach of this requirement shall be qualified as a serious misconduct.

## ***Resources of regulatory authority***

### *Human Resources*

Pursuant to Paragraph 3 of the Article 21 of the Law on Nuclear Energy, “the structure, competence of the State Nuclear Power Safety Inspectorate and its provision with resources shall correspond with the nature and scope of the activities in the field of nuclear energy, activities involving nuclear materials and other activities in the field of nuclear energy involving sources of ionising radiation undertaken and planned to be undertaken in the Republic of Lithuania”.

The Government of Lithuania establishes the maximum number of positions of the VATESI. The Head of VATESI establishes the concrete number of positions and approves the administrative structure of the VATESI and job descriptions of all employees.

The assessment of the adequacy of human resources is done through following procedures:

- Strategic Planning, which includes planning of the need of a particular number of employees, which is based on main strategic goals (such as main foreseen functions, main legislative initiatives) of the VATESI for the planning period (3 years). The Strategic Plan of the VATESI is approved by the Head of VATESI;
- Annual evaluation of qualification and activities of civil servant, conducted pursuant to Law on Civil Service. This procedure is also used to establish the training needs of the VATESI employees.

In case of foreseen changes, e.g., expanding nuclear programme, the practice is to establish internal working groups for evaluation of particular needs for changes in the structure of the VATESI, the number of positions and distribution of functions among its employees.

Pursuant to VATESI integrated management procedures, heads of divisions have an obligation to monitor constantly the workload and functions performed by their employees and inform the head of VATESI about the need for additional human resources.

The need for services of technical support organizations (experts) is evaluated annually through the procedure of establishing the Public Procurement Plan (i.e., while planning the procurement of services). This need is also evaluated during Strategic Planning procedure.

VATESI has 68 full-time maximum staff (civil servants and employees under employment contracts) positions approved by the Government of Lithuania. Out of this number, VATESI has established 63 positions of civil servants and employees under employment contracts. Additionally, there are 3 positions of state officials established pursuant to provisions of the Law on Nuclear Energy (all filled). 60 positions are occupied overall at the moment (January 2021). The number of personnel employed at VATESI is appropriate for current stage of nuclear programme.

### *Financial Resources*

According to Paragraph 2 of Article 21 of the Law on Nuclear Energy, VATESI activities are financed by the Lithuanian state budget appropriations and other legitimate income.



To fulfil its mission and strategic goals every year VATESI prepares Strategic Activity Plan for next three years. It is a part of national strategic planning and budgeting system. According to this plan, Government approves allocations for the implementation of the VATESI Programme.

Financial resources of VATESI cover the need for offices and office equipment, the salaries of staff, the costs of communications, transport, training, consultancy services, technical support and international co-operation. Financing of VATESI is appropriate for current stage of nuclear programme and covers VATESI's needs related to regulatory activities.

### ***RPC***

RPC is the regulatory authority implementing regulatory control over the exposure of humans and the environment and practices except those with sources of ionising radiation within nuclear energy field, which shall perform following functions (Law on Radiation Protection, Article 6):

- 1) carry out regulatory control of human and environmental exposure and activities, except practices with sources of ionizing radiation in the nuclear energy field;
- 2) carry out monitoring of human exposure as a public health risk factor in planned, existing and emergency exposure situations, by conducting research on objects that may lead to human exposure;
- 3) within the scope of its competence, carry out the hazard and risk analysis of radiological accidents other than radiological accidents at nuclear facilities, necessary for the preparation or amendment of the National Plan for Protection of Population in Case of Nuclear or Radiological Accident;
- 4) organizes the management of radiological accidents in accordance with the procedure established by the Government, participates in the liquidation of their consequences and, in accordance with its competence, participates in the management of nuclear accidents and the liquidation of their consequences;
- 5) controls the implementation of prevention measures that warn about the occurrence of orphan radioactive sources and objects contaminated with radioactive materials and the management of orphan radioactive sources and objects contaminated with radioactive materials, provides a conclusion on the recognition of radioactive sources and objects contaminated with radioactive materials;
- 6) perform other functions prescribed by Law on Radiation Protection and other legal acts regulating radiation and physical protection;
- 7) performs monitoring of ionizing radiation dose rate, performs radionuclide transfer forecast in the event of a nuclear or radiological accident (from January 1<sup>st</sup>, 2021).

### ***Financial and Human Resources***

RPC is mainly financed from the state budget. For the implementation of the particular assignments and projects other financial sources can be obtained (funds of EU and other international organizations). RPC has 58 employees (civil servants and employees employed on a labour contract basis).

### ***Ministry of Environment***

Ministry of Environment:

- participates as stakeholder in the strategic environmental assessment of national level plans and programs: the Ministry examines documents of strategic environmental assessment and the draft plans and programs and provides conclusions concerning them;
- organizes and coordinates EIA in the transboundary context;
- following the procedure prescribed by legislation and other legal acts, takes part in the issue of licences in radioactive waste management activities.

State Territorial Planning and Construction Inspectorate under the Ministry of Environment:

- takes part in state supervision and control of design and construction of nuclear facilities.

Environmental Protection Agency under the Ministry of Environment (EPA):

- participates as stakeholder in the strategic environmental assessment of plans and programs of local level (municipality lever or smaller): the Agency examines documents of strategic environmental assessment and the draft plans and programs and provides conclusions concerning them;
- coordinates the process of EIA of proposed economic activities and methodically manages it; makes decisions whether the proposed economic activities are allowed in the selected site;
- participates in the procedure of agreement of technical project for construction or reconstruction of nuclear facility and in the procedure of completion of construction;
- coordinates and performs state environmental monitoring (excluding radiological), and controls environmental monitoring (excluding radiological) of economic entities;
- exchanges monitoring information (excluding radiological) with other countries.

In 2020 the amendments of the Law on Radiation Protection were introduced (entered into force on January 1<sup>st</sup>, 2021) transferring responsibilities to coordinate and perform state environmental monitoring, also to control environmental monitoring of economic entities and exchange monitoring information with other countries to RPC.

#### *Human Resources (EPA)*

Separate department with eight divisions (including 6 regional divisions) is responsible for EIA, strategic environmental assessment (about 50 specialists), however it deals with EIA for all type of activities, not only related to management of spent fuel and radioactive waste.

#### *Financial Resources*

EPA activities are financed by the Lithuanian state budget appropriations and other legitimate income. To fulfil its mission and strategic goals every year EPA prepares Strategic Activity Plan for next three years. It is a part of national strategic planning and budgeting system. Financial resources of EPA cover the need for offices, laboratories, automatic measurement networks, the salaries of staff, and other costs related to activities.

## ***Article 7 - Licence holders***

### *Article 7.1*

*Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities rest with the licence holder. That responsibility cannot be delegated.*

Article 3 of the Law on Nuclear Safety stipulates: The full responsibility for ensuring nuclear safety shall fall on the persons in charge of the nuclear installation or the activities posing a risk of exposure to ionising radiation.

Article 16 of the Law on Nuclear Safety: Full responsibility for the nuclear safety of a nuclear installation and for nuclear safety in carrying out other activities with nuclear and/or nuclear fuel cycle materials shall solely fall on persons that are engaged in such activities and hold relevant licences and/or permits.

Article 30 of the Law on Nuclear Energy stipulates: The licence holder shall be responsible for the adequate and safe operation of the installation in accordance with the requirements stipulated in the laws and other legal acts, as well as in the articles of association, internal work rules of the licence

holder and in the terms of the issued licence. The licence holder shall be responsible for safety of its activities and the nuclear installation.

In the licence issued for the operator there is always emphasized that the licence holder is fully responsible for the safety in the nuclear facility and even if the licence is suspended, the responsibility for safety rests with the operator. For evaluating if the licence holder undertakes proper measures in ensuring safety of the management of spent nuclear fuel and radioactive waste, and how safety measures are implemented, the inspections are carried out. The licence holder shall provide safety reports of operation of nuclear facilities to regulatory bodies. Any changes in practice are coordinated with regulatory authorities and are allowed only after there was assured, that safety requirements will not be violated.

Small producers (generators) are responsible for all steps radioactive waste management according to the Law on the Management of Radioactive Waste:

Article 9 of the Law on the Management of Radioactive Waste stipulates:

1. It shall be the duty of a radioactive waste generator (small producers included) to manage, in accordance with the requirements established by legal acts, radioactive waste until transferring it to a radioactive waste manager (which is licensed by VATESI).
2. The radioactive waste generator shall pay all the expenses incurred during the management of radioactive waste from the moment of its generation to its emplacement at a disposal facility, including the expenses related to the post-closure surveillance of disposal facilities.
3. The radioactive waste generator shall not be exempt from the duties and responsibilities to manage radioactive waste safely even in the event of a temporary suspension or cancellation of the licence.

The duties and responsibilities of small producers in management of radioactive waste are set in Rules on Authorization of Practices with Sources of Ionizing Radiation (approved by Resolution No. 918 of the Government of the Republic of Lithuania). Before issuing the licence or registering practice with radioactive source, it is made certain, that the person intending to carry out the practices with radioactive source has all administrative, technical capabilities to carry out the practices with radioactive sources in safe and secure manner and (or) safely manage the radioactive waste.

*Article 7.2*

*Member States shall ensure that the national framework in place require licence holders, under the regulatory control of the competent regulatory authority, to regularly assess, verify and continuously improve, as far as is reasonably achievable, the safety of the radioactive waste and spent fuel management facility or activity in a systematic and verifiable manner. This shall be achieved through an appropriate safety assessment, other arguments and evidence.*

National legislation of Lithuania for the safety of spent fuel and radioactive waste management is described in Article 5.1 (b) of this Report.

Paragraph 2 Article 17 of the Law on Nuclear Safety states: Organisations operating nuclear installations and other holders of licences and/or permits must on a regular basis analyse the state of nuclear safety and improve it.

Paragraph 7 Article 32 of the Law on Nuclear Safety states: Not less frequently than every 10 years after the issuance of a permit of starting the industrial operation of a nuclear installation, the licence holder must make a periodic safety evaluation and substantiation and prepare a periodic safety evaluation report, which shall be submitted to the VATESI for its review and evaluation. Thereafter, the Head of the VATESI shall adopt a decision regarding the coordination (approval) of such report. During the periodic safety evaluation and substantiation it shall be established whether, considering the changes in legal regulation and the construction site and/or surroundings of a nuclear installation as well as taking into account ageing of constructions, systems and components and other factors that might have an impact on safety, it is ensured that a nuclear installation complies with its design, legal acts and normative technical documentation requirements of nuclear safety. If there are any inconsistencies detected, the licence holder shall prepare and implement indispensable corrective

measures that would secure the nuclear installation's compliance with its design, as well as ensure proper fulfilment of all requirements set in legal acts and technical standard documentation of nuclear safety. During the periodic safety analysis and substantiation it shall be also established whether radioactive discharges, their intensity as well as the pathways, media or points of their spread comply with those defined in the plan for radioactive discharges into environment, and together with the periodic safety evaluation report shall provide the updated plan for radioactive discharges into environment. The requirements for preparation of the periodic safety analysis and substantiation shall be established by the Head of VATESI.

*Article 7.3*

*As part of the licensing of a facility or activity the safety demonstration shall cover the development and operation of an activity and the development, operation and decommissioning of a facility or closure of a disposal facility as well as the post-closure phase of a disposal facility. The extent of the safety demonstration shall be commensurate with the complexity of the operation and the magnitude of the hazards associated with the radioactive waste and spent fuel, and the facility or activity.*

*The licensing process shall contribute to safety in the facility or activity during normal operating conditions, anticipated operational occurrences and design basis accidents. It shall provide the required assurance of safety in the facility or activity. Measures shall be in place to prevent accidents and mitigate the consequences of accidents, including verification of physical barriers and the licence holder's administrative protection procedures that would have to fail before workers and the general public would be significantly affected by ionising radiation. That approach shall identify and reduce uncertainties.*

The Law on Nuclear Energy and the Law on Nuclear Safety together with the regulations made under other laws establish the licensing system for activities related to nuclear materials or nuclear cycle materials (their transportation, acquisition, etc.), as well as for nuclear facilities of the following life-stages: site evaluation, design, construction, commissioning, operation, and decommissioning. The supervision of the closed radioactive waste repository, acquisition, keeping, use and transportation of nuclear or nuclear fuel cycle materials is also executed according to the laws mentioned above. This regulation should encompass the following areas:

- nuclear safety, radiation safety and physical security of nuclear facilities, nuclear and nuclear fuel cycle materials;
- fire protection of safety related structures, systems and components;
- emergency preparedness in nuclear facilities and during transportation of nuclear and/or nuclear fuel cycle materials;
- radioactive waste management safety;
- the release of radionuclides into the environment;
- management systems of legal entities engaged in a licensed activity and other activities, involving nuclear and nuclear fuel cycle materials or carried out in nuclear facility as well as assessment of the nuclear facility construction site.

In the Article 3 of the Law on Radioactive Waste Management, as one of the principles of radioactive waste management is indicated: radioactive waste management safety measures shall be implemented applying graded approach.

The Article 15 of the Law on Radioactive Waste Management states, that safety assessment of the existing and newly constructed radioactive waste management facilities shall be carried out in accordance with the requirements of the Law on Nuclear Safety. The safety assessment must cover full operating lifetime of the facility. Safety assessment of a disposal facility shall also cover the post-closure period.

The Article 25 of the Law on Nuclear Energy states, that the design of a nuclear installation shall comply with the nuclear safety requirements and rules approved by the Head of VATESI, also with the requirements of other legal acts. Safety of a nuclear installation shall be substantiated in the safety

analysis report which shall comply with the nuclear safety requirements and rules approved by the Head of VATESI.

Nuclear Safety Requirements - BSR-3.1.1-2016 “The General Requirements for Dry Type Storage for Spent Nuclear Fuel”, BSR-3.1.2-2017 “Regulation on the Pre-disposal Management of Radioactive Waste at the Nuclear Facilities” and BSR-3.2.2-2016 “Radioactive Waste Repositories” states, that safety must be ensured during normal operation, anticipated operational occurrences and design basis accidents.

Article 35 of the Law on Nuclear Safety states:

- In order to prevent or mitigate nuclear and radiological accidents, the principle of defence in-depth must be established meaning that more than one physical barrier for the confinement of radionuclides must be established during design, commissioning and operation of the facility. Technical and / or administrative measures must be envisaged in order to ensure the integrity of these barriers and measures to mitigate the effects of ionizing radiation if these barriers are degraded or their effectiveness reduced;
- technologies used for design and construction of a nuclear facility must be in line with established engineering practice. The technology must be based on experience or its suitability be determined by testing or analysis;
- the usage of design solutions, technical and organizational measures for prevention of nuclear and radiological accidents during design, construction, commissioning, operation and decommissioning of a nuclear facility must be ensured;
- technical and administrative measures in order to control nuclear and radiological accidents and to limit the consequences of these accidents in nuclear facilities must be established;
- in order to prevent nuclear and / or radiological accidents or other unusual events and to ensure and improve safety, licensee must regularly analyses the experience of its own and other persons in the field of nuclear energy as well as to share and take the necessary preventive and / or corrective measures ensuring the proper implementation of nuclear safety requirements.

Article 38 of the Law on Nuclear Safety states:

- based on the Law on Civil Protection of the Republic of Lithuania, a plan for national civil protection of population in the event of a nuclear accident shall be prepared and reviewed on a regular basis. Such plan shall foresee measures for protection of the population of the Republic of Lithuania, their property and environment against nuclear accidents and consequential radiological hazards, irrespective of whether the source of radiological hazard is within or outside the territory of the Republic of Lithuania;
- in case of a nuclear accident or incident, the holder of a relevant licence shall take part in the implementation of the national plan for the protection of population in the event of a nuclear accident and shall provide required information to the institutions specified therein;
- the emergency preparedness plans shall be developed in all nuclear installations and shall be effective (as further amended) until the full decommissioning of such installations. The emergency preparedness plans shall be tested not less frequently than once per year by organising trainings and exercise. The Head of VATESI shall establish special requirements for emergency preparedness and shall coordinate the emergency preparedness plans. The emergency preparedness plans of nuclear installations shall be approved by the licensee.

The licensee must submit the emergency preparedness plan of facility to VATESI before issuing the appropriate licence.

Typical safety analysis report of radioactive waste management or spent fuel management facility, which must be submitted to VATESI assessment before issuing appropriate licence, shall include general description of the facility and the environment of the facility, design basis, description of

structures, systems and components, description of activities, analysis of activities during normal operations and in case of emergencies, emergency preparedness plan, management system and etc.

More information on licensing system is described in the Article 5.1 (c) of this Report.

*Article 7.4*

*Member States shall ensure that the national framework require licence holders to establish and implement integrated management systems, including quality assurance, which give due priority to safety and are regularly verified by the competent regulatory authority.*

*National Requirements*

According to the Law on Nuclear Safety the one of the main areas of nuclear safety regulation is the management systems of the persons engaged in the licensed activities and in other operations related to nuclear and/or nuclear fuel cycles materials, as well as in the evaluation of construction site of a nuclear installation. The highest priority in the management system of such persons shall be the assurance of nuclear safety. Organizations operating nuclear installations and other holders of licences and/or permits must ensure high level of safety culture and competence of the organization and its workers, on a regular basis analyses the state of nuclear safety and improve it, consider human factors (human capabilities and their limits) at all stages of life of a nuclear installation and maintain an effective integrated management system with reasonable priority on nuclear safety.

BSR-1.4.1-2016 “Management Systems”, based onto the IAEA safety standard GSR part 2, is approved. This regulation specifies regulatory requirements for development, implementation and maintenance of an effective management system for the organizations which operate nuclear facilities and require covering all activities related to the use of systems and components important to safety, which is described in management system’s documentation and periodic assessment of the management system. An operating organization must establish an independent department in order to oversee application of management system requirements and coordinate its improvement. The licensee and its safety important contractors shall comply with all national legal requirements and regulations, including those in the area of nuclear safety.

According to BSR-1.4.1-2016, operating organization or licensee shall consider application of the IAEA recommendations published in the IAEA guides on management systems before developing or improving management system. BSR-1.4.1-2016 establishes requirements for implementation and continuous improvement of the integrated management system based upon GSR part 2 process approach including requirements as follows:

- periodically assess, monitor and continuously develop safety culture;
- to establish and constantly update management system documentation, and manage changes to the documents and identify the changed content within the documents;
- to approve safety as the top priority and the related commitment of management of a licence holder;
- to take into account requirements of interested parties during establishment and development of the management system, in decision-making process and in activities of a licence holder;
- to identify clearly responsibilities and roles of all employees for safety, implementation of the system requirements and adherence to safety and other legal requirements;
- to plan and ensure necessary human, financial and other resources necessary to ensure safety and implement goals and commitments of a licence holder;
- to identify, implement and improve processes with strict and systematic consideration of safety and other requirements when establishing processes and their interactions so the applicable legal requirements and standards are implemented in a safe and proper way;
- to ensure proper cooperation of management levels and different divisions for safe and effective performance;

- to apply reliable control mechanisms over activities performed by safety important contractors and still to retain the ultimate responsibility of a licence holder for safety;
- carefully prepare, plan, implement, monitor, adjust organizational changes and assess them after implementation to preclude deterioration of safety;
- to apply sufficient measurements, monitoring, control and checking activities and needed methods to ensure high level of safety, identification and following-up of needed improvements and effectiveness of the management system;
- to apply management self-assessment through all levels of management and to use the results to improve safety, safety culture and activities;
- to apply independent assessments and audits as an additional mechanism to proactively resolve safety issues and retro-actively identify needed corrections and opportunities to improve processes, the management system and (or) their documents;
- periodically perform comprehensive management reviews of the management system and to plan continuous improvement and resources to implement improvement activities.

VATESI requirements for decommissioning (BSR-1.5.1-2015) include the requirement for licensee to establish and to implement management system covering all activities having an impact on safe decommissioning, and prepare quality assurance programme outlining in it quality management measures, the allocation of responsibilities and resources, implementation procedures of actions of specific projects and storage of documents relating to the design, operation, final shutdown and decommissioning of the facility.

VATESI requirements for handling of radioactive waste in nuclear facilities before disposal (BSR-3.1.2-2017) include requirement for licensee to establish and implement quality management system applicable throughout the lifetime of a facility and for the entire duration of operation activities in normal, transient and emergency situations.

Licensee's quality assurance programme for radioactive waste handling before disposal shall be developed and implemented to ensure compliance with requirements and technical conditions necessary for activities to be carried out in a safe manner; compliance with requirements for storage and disposal; quality, integrity and tightness of stored radioactive waste packages throughout the entire storage period; quality of required documentation, records and identification of radioactive waste packages.

## RPC

RPC is responsible for supervision how small radioactive waste producers establish and implement quality assurance measures according to HN 73:2018 "Basic Standards of Radiation Protection". Safety culture, which encourages licensees and workers to improve radiation protection that guarantee implementation of requirements on protection and assessment of quality control and efficiency of protection measures, shall be implemented in practices.

Small radioactive waste producers in the quality assurance programme shall:

- designate and appoint person (service) responsible for establishment and implementation of the quality assurance programme;
- foresee the order of registration and accountancy of implemented procedures;
- describe the method (certain procedures), the order of how the workers familiarize with them;
- indicate quality control procedures, which shall be carried, and their periodicity.

The quality management system of RPC conforming to EN ISO 9001 standard was implemented in 2009 and covers all activities of RPC in Management of State Register of Sources of Ionising Radiation and Occupational Exposure, Authorization of Activities with the Sources of Ionizing Radiation, State Radiation Protection Supervision and Control, Emergency Preparedness and Response, Public, Occupational and Environmental Exposure Monitoring and Expertise, Radiation Protection Education and Training. The external and internal auditors' reports confirmed

that the Quality Management System of RPC successfully operates and is a daily working tool the staff performs everyday tasks according to the system procedures and work instructions.

### *Status of Implementation of the national requirements*

#### Ignalina Nuclear Power Plant (INPP)

According to BSR-1.4.1-2016 and taking into account organizational changes related to decommissioning process, INPP has started the transition from quality assurance system to integrated and process-based management system. As part of the transition period, level 1 documents (management system manual, policies, strategies) and level 2 documents (management procedures) are being reviewed.

The INPP management system integrates all organizational components (including its structure, resources, processes and safety culture) so as to establish the goals and objectives of the organization and enable the organization to achieve all of these goals and objectives.

The application of the integrated management system requirements is graded so as to deploy appropriate resources, on the basis of the consideration of the significance and complexity of each product or process, the hazards and the magnitude of the potential impact associated with the safety, health, environmental, security, quality and economic elements of each product or process and the possible consequences if a product fails or a process is carried out incorrectly.

Management procedures “Nuclear fuel management”, “Pre-disposal management of radioactive waste” and “Radioactive waste management at repositories” have been implemented at INPP to control the processes of nuclear fuel and radioactive waste management. The management procedures contain information necessary for administration to manage these works at INPP:

- Objective and field of application of the management procedure;
- Responsibility and authorities of the administration for the activity defined by the management procedure;
- Information on how the work is performed including processes of planning and scheduling;
- Administrative and technical data necessary for the work performance;
- Information on how the plant divisions co-operate when performing work;
- Information on the documents and records necessary for the work performance, information on the records, which have to be kept after the work will be completed;
- References to the detail working procedures.

Licensing process and control of small radioactive waste producers warrants that appropriate quality assurance programmes concerning the safety of SF and radioactive waste management are established and implemented.

#### *Article 7.5*

*Member States shall ensure that the national framework require licence holders to provide for and maintain adequate financial and human resources to fulfil their obligations with respect to the safety of spent fuel and radioactive waste management as laid down in paragraphs 1 to 4.*

Article 17 of the Law on Nuclear Safety states:

1. Organisations that operate nuclear installations or other persons engaged in these activities must hold a licence and/or permit issued by the VATESI and must have the material, financial and human resources that are sufficient for involvement in the licensed activity or operations regulated by permits in compliance with the legal acts and technical standard documents of nuclear safety.

2. Organisations that operate nuclear installations and other licensees must:

- 1) maintain and improve the level of safety culture in order to ensure prevention of unusual events in nuclear facilities;
- 2) ensure to have enough qualified staff in the area of nuclear, radiation, physical safety, emergency



preparedness and international nuclear non-proliferation responsibilities in order to warrant its activity and prepare to respond to nuclear and radiological accidents and nuclear incidents in accordance with legislation;

3) constantly analyze the state of nuclear, radiation and physical safety and improve it;

4) consider human factors (human capabilities and their limits) at all stages of life of a nuclear installation;

5) have an integrated management system that gives priority to nuclear, radiation and physical safety.

Pursuant to Paragraph 1 of Article 23 of the Law on Nuclear Safety the licences and permits shall be issued to persons with sufficient capacities in terms of technological and financial resources, management system, human resources allowing to properly fulfil the conditions required by the licence or permit and to ensure nuclear safety.

The process of selection and training of staff at INPP is performed in accordance with the second and third level of INPP management system procedures that guarantee sufficient skills of personnel involved in all fields of activity at INPP, including SF and radioactive waste handling.

Management system procedures such as “Human resources management procedure” MS-2-014-1, “Nuclear fuel handling procedure” MS-2-012-1 and “Waste management procedure” MS-2-013-1, which regulate requirements for personnel involved in SF and radioactive waste management activities, are developed in accordance with IAEA documents TRS No. 380, NS-G-2.8, SSR-4, TS-6-1.2, NS-G-2.5, GS-G-3.1.

Initial and continuous training of personnel is performed on the basis of a Systematic Approach to Training, providing the highest level of personnel training.

All activities regarding on personnel recruitment, initial, continuous and re-qualification training, personnel certification and career development are performed in order to provide INPP with sufficient number of skilled personnel for safe and in time decommissioning of the plant.

## ***Article 8 – Expertise and skills***

### *Article 8*

*Member States shall ensure that the national framework require all parties to make arrangements for education and training for their staff, as well as research and development activities to cover the needs of the national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills.*

The project of new NPP (Visaginas NPP) is cancelled and the National Energy Independence Strategy does not foresee development of nuclear energy in Lithuania. The National Energy Strategy is focused on the renewable sources of energy and energy efficiency. Due to these reasons new NPP projects are not foreseen. Lithuania's nuclear energy program is declining and the demand for labour will be low in the future. The demand for new nuclear specialist is too low for sustaining a separate Study Programme in Nuclear Energy at educational institutions of Republic of Lithuania.

The largest Lithuanian employer in the field of the management of radioactive waste is Ignalina NPP. The main purpose of the Ignalina NPP Human Resources Management is to prepare the required number of qualified personnel for decommissioning activities including spent fuel and radioactive waste management at the right time.

Management of the human resources in the Ignalina NPP is carried out in accordance with the long-term objectives of human resources management determined in the SE INPP Activity Strategy for the years 2020-2038, approved on 2020-02-24 by Order No. 1-32 of the Minister of Energy of the LR, DVSta-0102-1 and IAE policy in the field of human resources management, DVSta-0108-2.

The human resources management process is planned, implemented and controlled on the basis of the description of the Human Resources Management Procedure, DVSta-1411-1. Long-term human

resource demand planning is based on the description of the SE INPP Activity Planning instruction, DVSeD-0112-3.

The need for Ignalina NPP personnel involved in all fields of activity at Ignalina NPP, including spent fuel and radioactive waste management is determined in accordance with the personnel needs calculation methodologies by types of activities, depending on the scope of work projected in the long-term Schedule of INPP decommissioning Megaproject, DVSeD-0115-3 and annual work plans. In order to determine the current needs for human resources, an analysis of the needs for human resources is carried out annually. Based on the analysis, the Staff positions lists of the Ignalina NPP divisions for the planned year are formed.

Ignalina NPP once every two years fulfils the long-term (10 years) analysis of demand of human resources according to Schedule of INPP decommissioning Megaproject taking into consideration employees' achievement of retirement age. Analysis allows timely monitoring of the dynamics of employees demand and the number of Ignalina NPP employees. The last analysis was carried out in 2020 and presented in the Preliminary needs for human resources until 2030 analysis report, No. At-3652(11.204E).

In order to ensure the sufficient number of employees who are important to safety the programme for long-term provision of personnel who is important to safety, DVSta-1410-1 has been developed. To ensure the reserve of employees who are important to safety the List of forming of the reserve of employees who are important to safety (last version 2020-11-13 No. Sr-2930(11.204E)), the Long-term plan (10 years) for preservation of competencies of the employees who are important to safety, MtDPI-1(3.254) and the Plan (5 years) of the recruitment and training of the employees who are important to safety, MnDPL-570(11.204) have been developed at the INPP.

In order to provide the Enterprise with sufficient number of qualified employees to ensure safe and efficient INPP decommissioning process the Program of young specialists engaging to INPP, DVSta-1410-2 was developed. In frame of this program the Enterprise carries out the cooperation with educational institutions of Republic of Lithuania (organization of students practice in Ignalina NPP, participation in joint activities and so on). The Enterprise cooperates with Kaunas University of Technology, Vilnius University, Utena University of Applied Sciences and Visaginas Technology and Business Vocational Education and Training Centre organizing student practice, participating in career days, lecturing on Ignalina NPP activities to attract young specialists to work at Ignalina NPP. To implement the Program of young specialists engaging to Ignalina NPP, the demand of young specialists (5 years) for INPP decommissioning is determined annually. The last analysis was carried out in 2020 and presented in the report, At-3657(11.204E).

According to the Order of the Minister of Health of the Republic of Lithuania No. V-1001 on the Amendment of the "The Procedures for training and instruction in radiation protection and physical protection (last amended 2018), it is required, that the main following groups have to be trained in radiation protection:

- radiation protection officers and physical protection officers;
- workers except those involved in practices with sources of ionising radiation in the nuclear energy field;
- civil servants and contract employees of state and municipal institutions and bodies who are engaged in emergency management;
- emergency workers appointed by the undertaking;
- officials and employees of the civil protection system (fire and rescue forces, police, ambulance) serving as first responders in emergency case, as well as officers, employees, companies, bodies, organizations managers or their authorised persons and other persons likely to detect orphan radioactive sources and radioactively contaminated objects when working.

For more effective training and paying an attention to the appropriateness of the education, there are determined the minimum requirements of education levels for persons, dealing with the sources on their work.

## **VATESI**

Pursuant to Paragraph 1 of Article 24 of the Law on Nuclear Energy, “State Nuclear Power Safety Inspectorate shall employ qualified personnel with experience and special knowledge necessary to perform functions of this institution, based on the qualification, education and other criteria established for certain positions. State Nuclear Power Safety Inspectorate shall build and further develop such competences of the employees of State Nuclear Power Safety Inspectorate which would allow drawing conclusions regarding the safety level of operation of nuclear installations and other activities involving nuclear materials and the nuclear fuel cycle materials and (or) other activities in the area of nuclear energy involving sources of ionising radiation and the compliance of such safety level with the requirements set forth in the legal acts and technical standard documents, also adopting the required decisions in the area of regulation.”

Procedures for training of VATESI staff are established in its integrated management documents. The established training methods are - formal training (courses, workshops), introductory training of public servants, initial internal training, lecturing by VATESI employees, self-study and work with more experienced specialists. Major part of courses and workshops related to the nuclear safety of nuclear installations are the ones organized by IAEA.

The procedure for analysis of training needs and organizing different types of training events is as follows:

- each employee of VATESI is required (by their job description) to meet and further develop the qualification needed for properly carrying out their functions;
- the need for training (improvement of qualification) is evaluated in the beginning of every year during annual evaluation of civil servants. The main aspects considered during evaluation and establishment of training needs (improvement of qualification) are priority of safety, promotion of safety culture, experience, present and required knowledge of the employee, needs of licensees (e.g. fields in which the highest number of consultations were needed), latest regulation practices and etc.;
- based on above mentioned evaluation, Annual plans for improvement of qualification are drafted and carried out.

## **RPC**

Generating new knowledge and skills is an integral part of the work of RPC employees. Staff is compulsorily required to engage in a training and education courses for professional qualification. They are obliged to complete 120 hours of training in every five-year period.

The need for training and education is evaluated in the beginning of every year and personal qualification development and training plans are prepared annually with respect to the demands of employees and results of performance evaluation. The proceeding of the plan implementation is supervised and the qualification development report and analysis are prepared.

RPC specialists share the experience, knowledge and the ways to apply them in their direct work. After returning from training courses, conferences or other events, RPC specialists indicate in their reports how the knowledge gained will be applied to perform the functions specified in their job descriptions.

## **Environmental Protection Agency (EPA)**

Procedures for training of EPA personnel are established in its integrated management documents. Additionally, for specialist in laboratory trainings are planned in accordance with requirements of international standard ISO 17025:2005. The established training methods are: formal training (courses, workshops), introductory training of public servants, initial internal training and self-study. The procedure for analysis of training needs and organizing different types of training events is as follows:

- each employee of EPA is required (by their job description) to meet and further develop the qualification needed for properly carrying out their functions;
- the need for training (improvement of qualification) is evaluated in the beginning of every year during annual evaluation of civil servants and evaluation of laboratory specialists. Based on this evaluation, annual plan for improvement of qualification is drafted and carried out.

## ***Article 9 – Financial resources***

### *Article 9*

*Member States shall ensure that the national framework require that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators.*

According to the Law on Radioactive Waste Management Article 9, the radioactive waste generator shall pay all the expenses incurred during the management of radioactive waste from the moment of its generation to its emplacement at a disposal facility, including the expenses related to the post-closure surveillance of disposal facilities.

According to the Law on Radioactive Waste Management, an operator of a radioactive waste management facility must take the appropriate steps to ensure that sufficient qualified staff and adequate financial resources are available during the decommissioning.

Required financial resources for the management of spent fuel and radioactive waste from Ignalina NPP are described in the Revised Final Decommissioning Plan of Ignalina NPP (FDP) and in the Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030.

As mentioned in Article 5.1(h) of this Report there are several financing sources for the management of radioactive waste and spent fuel in Lithuania: State budget, Ignalina International Decommissioning Support Fund, Ignalina Programme. New radioactive waste management facilities, which are or will be built as part of the INPP decommissioning process, such as solid radioactive waste management and storage facility, interim spent nuclear fuel storage facility, landfill and near surface disposal facilities and others, are being financed from the Ignalina International Decommissioning Support Fund, Ignalina Programme and co-financed State budget. These financing sources are identified in Article 4 of the Law on the Decommissioning of Ignalina Nuclear Power Plant.

The Ignalina Programme is financed from the European Union budget. The Ignalina Programme was created under Protocol 4 of the Act of Accession of Lithuania into the European Union in order to provide assistance for the decommissioning of INPP (including radioactive waste management) and consequential measures in the energy sector. The European Commission by its implementing decisions allocates annual Union contributions under the Ignalina Programme through two channels – the Ignalina International Decommissioning Support Fund and the National Agency in Lithuania (Central Project Management Agency or CPMA). The Ignalina International Decommissioning Support contains contributions of the donors, where the main contributor is the European Commission. The European Bank for Reconstruction and Development is the administrator of the fund, while the governing body is the Donors Assembly. With endorsement of the Government of Lithuania, the CPMA has been designated by the European Commission to act on its behalf as the National Agency of the Ignalina Programme. The CPMA is an agency under the Ministry of Finance of Lithuania. The funding for Ignalina Programme is based on annual commitments. Therefore a radioactive waste management project which lasts more than 1 year will be financed from funding commitments accumulated in several years. Projects that have received the favourable opinion of the

Nuclear Decommissioning Assistance Programme Committee and approval of the European Commission are contracted through the CPMA in accordance with the Lithuanian Public Procurement Law. The Republic of Lithuania takes responsibility and provides full financial guarantees to the European Commission in respect to activities of the CPMA.

To ensure smooth and uninterrupted progress of Ignalina NPP decommissioning, the continuity of adequate EU support is vital. The total funding gap until decommissioning completion amounts to EUR 1548 million, required financing from EU until 2038 amounts to EUR 1331 million. The Council of the European Union adopted Council Regulation on Union support for the nuclear decommissioning assistance programme in Lithuania on 25 January 2021. The financial envelope for the implementation of the Ignalina programme for the period 2021–2027 was set at EUR 490 million. Lithuania contributes approximately 14 percent of the funds required for INPP decommissioning. The agreed sum is adequate for the implementation of the planned works under the Ignalina NPP decommissioning schedule (Megaproject) for the 2021–2027 period. In the middle of the 2021–2027 period will start the negotiations on EU level for the 2028–2034 multiannual financial framework.

Institutional waste producers pay for their waste collection, transportation, treatment, and storage and disposal services according to contracts with State Enterprise Ignalina Nuclear Power Plant. The fees for these services were approved by the Order of the Minister of Energy No. 1-303 “On the State Enterprise Ignalina Nuclear Power Plant for the Management of Radioactive Waste”. Mandatory revisions of the fees are carried out once in two years. INPP collects fees from the institutional waste producers into a separate dedicated account. The management of historical institutional waste is funded from the state budget or municipal budget.

Specific attention is given to the management of spent sealed sources. In Article 24 of the Law on Radioactive Waste Management it is stated that in the case of import of sealed sources into Lithuania it is obligatory for licence holder to obtain a written commitment from the source provider to return the sealed source after its disuse and to contract the radioactive waste manager (currently State Enterprise Ignalina Nuclear Power Plant) for the management of source in a case, if due to arisen circumstances it would be impossible to return the source to the supplier, and to insure for the value equivalent to the fees of the radioactive waste management services fixed in the above mentioned Order of the Minister of Energy.

According to the Article 9 of the Law on Radioactive Waste Management, management of the orphan sources is funded from the state budget or municipal budget.

In 2020 the Seimas of the Republic of Lithuania (Parliament) approved a financing mechanism for the final disposal (deep geological repository) of spent nuclear fuel and high level radioactive waste. By the Resolution of the Seimas of the Republic of Lithuania were amended provisions of the Reserve Fund, according to which Lithuania annually allocates at least 3 million euros to the separate account of the Reserve Fund (dedicated for collecting funds for deep geological repository).

Currently activities related to the development of deep geological repository are funded from State budget. According to provisions of the Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 activities related to the development of deep geological repository will be funded from State budget until 2030. Later they will be funded from the Reserve Fund.

Another major project outside the scope of decommissioning of Ignalina NPP is Decommissioning of the Maišiagala radioactive waste storage facility. The project is financed by the EU Cohesion Fund Structural Assistance Programme for 2014-2020.

Implementation of Decommissioning project of Maišiagala RAW storage facility started in December 2016. The first part of Decommissioning project: licensing, designing and other preparational tasks was accomplished in the first quarter of 2021. Second part of Decommissioning Project started with the public tender for preparatory works for the demolition of Maišiagala RAW storage buildings,

including the construction and installation of temporary structures. Decommissioning should be completed in 2023.

## ***Article 10: Transparency***

### *Article 10.1*

*Member States shall ensure that necessary information on the management of spent fuel and radioactive waste be made available to workers and the general public. This obligation includes ensuring that the competent regulatory authority inform the public in the fields of its competence. Information shall be made available to the public in accordance with national legislation and international obligations, provided that this does not jeopardise other interests such as, inter alia, security, recognised in national legislation or international obligations.*

### VATESI

Pursuant to Article 39 of the Law on Nuclear Safety, VATESI and licensees must inform the state and municipal institutions, the general public and persons whose commercial activities are directly related to the licensed activities of licensees in regard to the nuclear, radiation and physical safety of nuclear facilities at least once a year, publicly announce information about their activities in media and/or on their website. VATESI also arranges meetings with municipal and state institutions, the public and other persons in the vicinity of the nuclear facility at least once every three years to inform them about the state of nuclear, radiation and physical safety of this facility. VATESI shall, at least once a year, publish in the media and/or on its website reports on the results of the supervision of the activities of economic entities whose activities are monitored in accordance with this and other laws by VATESI.

The licensees and the holders of the permits shall submit to their employees and other persons legally present at the site of the nuclear facility, the following information about the existing conditions of operation of the nuclear facility and their compliance with normal operating conditions:

- 1) information on the radiological conditions at the site of the nuclear facility and in the placements where such persons are expected to work or visit and their compliance with the requirements of legal acts and nuclear normative technical documents which regulate radiation safety in nuclear facilities;
- 2) information on existing deviations from normal operating conditions, if they can affect the health of these persons.

This information shall be provided to persons each time before they enter to the site of the nuclear facility.

The licensees of operated facilities shall provide to the general public the following information about the existing conditions of operation of the nuclear facility and its compliance with normal operating conditions:

- 1) radiological conditions at the site of the nuclear facility and/or their compliance with the requirements of legal acts and normative technical documents of nuclear safety which regulate radiation safety in nuclear facilities;
- 2) the release of radionuclides into the environment from the nuclear facility and/or its compliance to the requirements established in legislation;
- 3) deviations from normal operating conditions if they can influence to the human health, safety, their property and the environment.

Mentioned above information shall be published on the website of the licensee or permit holder. When public or person makes an application, the information must be submitted no later than one day after receipt of the request for submission.

VATESI is developing open communication tools to ensure transparency. The ongoing dialogue and interaction with main licensees and other stakeholders are the main priorities in daily communication tasks.

Annually VATESI issues report on the activities of regulation in nuclear safety, presents this report to the President, the Government and the Parliament and provides information to the local authorities,

international organizations and the public. In addition, VATESI specialists proactively participate in different workshops and conferences to share information about relevant nuclear safety issues in Lithuania and worldwide.

While implementing delegated supervision functions VATESI provides public consultations to the legal entities that submitted written questions or provides public consultations on its own initiative. The procedure of public consultations is outlined in Nuclear Safety Requirements BSR-1.1.2-2016 “Rules on providing confirmed written and publicly announced consultations”. Information meetings or consultations in informal manner with licensees help to promote dialogue and more favorable working environment with high degree of transparency. It is important to add that INPP and VATESI managers have quarterly meetings to discuss about relevant nuclear safety issues.

Accessible website [www.vatesi.lt](http://www.vatesi.lt) for public and the licensees is in place. On this website, licensees can find comprehensive information on all aspects of regulatory decisions. Website includes information on specific events and unusual incidents, annual VATESI and national reports, press releases, relevant guidelines and legislation, information about main VATESI activities and performance indicators. Up to date information on electronically basis provided in Lithuanian and English languages. General public and media inquiries are handled in a timely manner. Information and documents are being made public according to national legislation regulating restricted information. Public opinion surveys regarding nuclear safety issues were organized by VATESI in 2009, 2011 and 2014.

Arrangements have been made for providing useful, timely, truthful, consistent and appropriate information to the public in the event of a nuclear or radiological emergency.

The State Emergency Management Operation Centre is responsible for providing information to public in case of emergency. The State Emergency Management Operation Centre shall activate the Press Centre in the Press Service of Government of Republic of Lithuania or in Fire and Rescue Department. In case of an emergency State and municipality’s institutions, public offices and citizens is notified using existing public warning and notification system.

In 1994 Lithuania has joined the Convention on Early Notification of a Nuclear Accident and in 2000 has joined to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. According to Resolution No 972 of the Government of the Republic of Lithuania on 13th October 1994 VATESI is responsible for implementation of Article 7 and provision of information to IAEA and neighboring countries according to Article 5 of Convention on Early Notification of a Nuclear Accident. According to Resolution No 1168 of the Government of the Republic of Lithuania on 29th October 2005 Fire and Rescue Department is responsible for implementation of Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. According to the IAEA EPR-IEComm manual, VATESI is National Warning Point (NWP), National Competent Authority for events abroad NCA(A) and Fire and Rescue Department – National Competent Authority for domestic events NCA(D). VATESI is also a contact point and competent authority in ECURIE arrangements.

## RPC

According to the Article 34 of the Law on Radiation Protection:

1. RPC is obliged, at least once a year, to publish information on the assurance of radiation and physical protection and the results of supervision of the practices carried out by undertakings.
2. RPC is obliged to respond to the inquiries regarding the status of radiation and physical protection received from the state and municipal authorities and bodies, public and other parties concerned, including persons in the vicinity of the undertaking, or hold meetings on these issues.
3. The provision of information within the competence of international organizations, regulatory bodies of other Member States and other parties concerned is mandatory if supervisory experience has been acquired regarding issues of radiation or physical protection is relevant to the regulatory authorities of other Member States.

## INPP

INPP ensures transparency and provides detail up-to-date information about the enterprise activities, completed and ongoing decommissioning projects, radioactive waste management to general public via INPP webpage <http://www.iae.lt/> on regular basis in Lithuanian, English and Russian languages. INPP maintains an active communication policy with media via press releases, press conferences, interviews and presentations to journalists.

INPP publishes official publications and leaflets that are free of charge to the visitors covering the following subject matters: quantities, management and storage of radioactive waste, management of spent fuel, decommissioning projects, decommissioning funding, environmental safety and other decommissioning relevant data. Short movie about the INPP decommissioning covering all key projects and radioactive waste management was created and is shown in INPP Communication Division Information Center for visitors and was shown on national TV for general public.

Environment Impact Assessment Reports (EIAR) are being conducted and presented to the local municipality. The presentation of EIAR is an open event and public participants can participate and discuss during the event. Information about the time and place of the event is being provided in Visaginas municipality's webpage. Hard copies of EIAR are available for general public and workers at INPP Communication Division and digital copies are available on INPP webpage.

INPP organizes excursions to interested legal and private entities in the Communication Division Information Center and INPP controlled area during which the information about the decommissioning projects, spent fuel and radioactive waste management, radiation etc. is provided and questions of visitors answered.

INPP maintains an active communication with employees via inner webpage where information is provided about the activities of the plant and each employee may ask questions to the management anonymously. Monthly newspaper for employees is being published providing information and articles about the decommissioning projects, radioactive waste management, radiation levels and other data that may be relevant to employees.

International seminars and workshops are organized in order to share the experience of uranium graphite reactors decommissioning, irradiated graphite waste management and storage issues.

### *Article 10.2*

*Member States shall ensure that the public be given the necessary opportunities to participate effectively in the decision- making process regarding spent fuel and radioactive waste management in accordance with national legislation and international obligations.*

Lithuanian public is given the opportunity to participate in the decision-making process, regarding spent fuel and radioactive waste management, during strategic environmental assessment and environmental impact assessment process.

Pursuant to Article 39<sup>1</sup> of the Law on Nuclear Safety, the public, as defined in this article, as one or more person and/or juridical persons, their associations, organizations or groups, can participate in the adoption of the following decisions in the field of nuclear energy: evaluation of site, construction and operating, decommissioning and post-closure surveillance of disposal facilities.

The process of public participation in decision-making in the field of nuclear energy includes:

- 1) provision of information to the public on the start of the proceedings of: evaluation of site, construction, operating, decommissioning and post-closure surveillance of disposal facilities;
- 2) public access to the documents necessary for the adoption of the decisions for: evaluation of site, construction, operating, decommissioning and post-closure surveillance of disposal facilities;



- 3) public knowledge of draft of decisions for: evaluation of site, construction, operating, decommissioning and post-closure surveillance of disposal facilities;
- 4) provision of public comments, information, analyzes or opinions regarding the documents referred to in p. 2 and draft decisions referred to in p. 3;
- 5) public discussion about the final documents required for the adoption of the decisions or the final draft decisions for: evaluation of site, construction, operating, decommissioning and post-closure surveillance of disposal facilities.

VATESI informs the public that a draft decision for evaluation of site, construction, operating, decommissioning and post-closure surveillance of disposal facilities has been prepared and allows the project and documents, submitted for the decision, to receive access and submit written proposals in time terms, established by the Law on Nuclear Safety.

All proposals submitted by the public must be evaluated. The information on how the proposals are evaluated, together with the arguments, if the proposals have not been taken into account or partially taken into account, the economic entity submits to the representatives of the public who has submitted proposals to the economic entity in writing and VATESI publishes them together with the final decision.

Documents that contain confidential information are not submitted for public discussion.

The procedure for organizing public participation in decision-making in the field of nuclear energy is established in Nuclear Safety Requirements BSR-1.1.5-2017 “Description of procedure for public participation in decision-making in the field of nuclear energy” (2017).

Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programs on the environment is transposed into national legislation: Law on Environmental Protection of the Republic of Lithuania; Order of Assessment of the Effects of Certain Plans and Programs on the Environment approved by Governmental Resolution; Regulation on Public participation in the Territorial Planning Process approved by Government Resolution; Order of Public Participation in Strategic Environmental Assessment Procedures of Plans and Programs and Informing of the Stakeholders, European Union Member States and Other Foreign States approved by the minister of environment and other implementing acts.

The strategic environmental assessment procedures, requirements for documentation and public participation also comply with the following international conventions:

- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, 25<sup>th</sup> June 1998;
- Protocol on Strategic Environmental assessment to the Convention on the Environmental Impact assessment in a Transboundary Context, Kyiv, 21<sup>th</sup> May 2003.

Directive 2011/92/EU of European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (amended by Directive 2014/52/EU) is transposed into national legislation: the Law on the Environmental Impact Assessment of Proposed Economic Activity (last amended in 2017) and acts implementing the law. In accordance with amended Law on the Environmental Impact Assessment of Proposed Economic Activity competent authority makes information on screening regarding EIA and/or EIA documentation (scoping document, EIAR) publicly available shortly after receiving application from developer of the project. Public has possibility to express and the decision-maker to take account of opinions and concerns which may be relevant to those projects.

The EIA procedures, requirements for documentation and public participation also comply with the following international conventions:

- Convention on Environment Impact Assessment in a Transboundary Context, Espoo, 25<sup>th</sup> February 1991;

- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, 25<sup>th</sup> June 1998.

## ***Articles 11 and 12– Implementation of the national programme***

### *Article 11.1*

*Each Member State shall ensure the implementation of its national programme for the management of spent fuel and radioactive waste ('national programme'), covering all types of spent fuel and radioactive waste under its jurisdiction and all stages of spent fuel and radioactive waste management from generation to disposal.*

### *Article 11.2*

*Each Member State shall regularly review and update its national programme, taking into account technical and scientific progress as appropriate as well as recommendations, lessons learned and good practices from peer reviews.*

### *Article 12.1*

*The national programmes shall set out how the Member States intend to implement their national policies referred to in Article 4 for the responsible and safe management of spent fuel and radioactive waste to secure the aims of this Directive, and shall include all of the following:*  
*(c) an inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of the radioactive waste and spent fuel in accordance with appropriate classification of the radioactive waste*

The content of the radioactive waste management development program (Article 12 of the Council Directive 2011/70/EURATOM) is defined by the Order of Minister of Energy No. 1-6 Procedure on the preparation of the radioactive waste management development program (2019). On the same time radioactive waste management development program is part of the national legal framework and is subject to the Law on Strategic Management and Methodology on Strategic Planning (approved Government resolution No. 292 (2021)). All development programs implement the tasks of the National Progress Plan. According to the Methodology on Strategic Planning, all national development programs should be contained in the two documents: development program approved by Resolution of the Government and implementation measures of the development program approved by the Order of the appropriate Minister.

The new Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (Development Programme) was approved by the Government of Lithuania on February 3, 2021 by Resolution Nr. 76. Development Programme was prepared based on Radioactive Waste Management Development Programme (2015), INPP FDP (renewed version of 2020), taking into account requirements of the national legal acts, Directive 2011/70 EURATOM and requirements of the new Law on Strategic Management (2020) and Methodology on Strategic Planning (2021). The Development Programme implements of the 2021–2030 National Progress Plan (approved by the Government on 9 September 2020) task 6.9 “To safely decommission nuclear power facilities and manage radioactive waste”.

Taking into account requirements of the Methodology on Strategic Planning were prepared and adopted Implementation Measures of the Development Programme for Decommissioning of Nuclear Power Facilities and Radioactive Waste Management for 2021–2030 (Implementation Measures) (approved by the Order of the Minister of Energy).

The Ministry of Energy coordinates and monitors the implementation of the Development Programme and Implementation Measures.

The Development Programme are adopted for a 10-year period. This period coincides with the National Progress Plan period. The Development Program might be reviewed sooner if necessary.

The Development Programme aims at a safe decommissioning of nuclear power facilities and management of all radioactive waste that has been and will be generated in Lithuania in order to protect people and the environment from the harmful effect of the ionizing radiation and not to leave an undeserved burden on future generations.

The Development Programme and Implementation Measures covers all radioactive waste management steps, including the preparatory steps to the final disposal site for spent nuclear fuel. Six Implementation Measures are identified in the Development Programme:

Measure	Indicator name of the measured result	Indicator values of the measured result <sup>1</sup>	
		01/01/2020	31/12/2030
1. To dismantle nuclear power facilities <i>(All equipment (167 thousand tons) is planned to be dismantled by 2034, and all structures (149 units) to be demolished by 2038.)</i>	1. Percentage of dismantled equipment out of the total volume of the equipment to be dismantled  2. Percentage of demolished structures out of the total volume of the structures to be demolished (including the Maišiagala Radioactive Waste Storage Facility)	32.78 %  3.3 %	74.14 %  61.07 %
2. To conduct the primary treatment of RAW <sup>2</sup> <i>(The primary treatment of RAW generated from the equipment (167 thousand tons) to be dismantled is planned to be conducted by 2033.)</i>	Percentage of RAW generated from dismantled equipment that has undergone the primary treatment out of the total RAW generated from dismantled equipment that has to undergo the primary treatment	31.01 %	74.14 %
3. To conduct basic and final treatment of RAW and ensure the storage of all RAW <i>The basic and final treatment of all RAW that will be generated during the decommissioning of the INPP and the basic treatment of already generated short-lived RAW and all long-lived RAW are planned to be performed by 2038. The following amounts will be generated:</i> <input type="checkbox"/> <i>approx. 60,000 m<sup>3</sup> (approx. 10,000 m<sup>3</sup> has already been generated) of short-lived very low-level RAW packages;</i>	Percentage of short-lived RAW that underwent the final treatment and long-lived RAW packages after the basic treatment	20 %	50 %

<sup>1</sup>Indicator values are provided in a cumulative manner.

<sup>2</sup> The measure establishes only the primary treatment indicator of waste from decommissioned nuclear facilities, excluding the structure demolition waste management. During the preparation of the programme, only the total amount of radioactive waste generated by the demolition of structures was estimated, the indicators of the primary treatment of this waste are not planned.

<ul style="list-style-type: none"> <li>□ approx. 50,000 m<sup>3</sup> (approx. 11,000 m<sup>3</sup> has already been generated) of short-lived low- and intermediate-level RAW packages;</li> <li>□ approx. 14,500 m<sup>3</sup> of bituminised short-lived low- and intermediate-level RAW has been deposited into the bituminised RAW storage facility;</li> <li>□ approx. 7,500 m<sup>3</sup> of long-lived low and intermediate-level RAW packaging has been deposited into corresponding storage facilities;</li> <li>□ very RAW packages: 98 CONSTOR (already produced and deposited into a storage facility), 18 CASTOR (already produced and deposited into a storage facility), and 190 CONSTOR M2 (161 pcs have already been produced and deposited into a storage facility) will be produced and deposited into a storage facility by 2023.</li> </ul> <p>The final disposal of long-lived RAW and highly radioactive waste is planned to be completed by 2070.</p>			
<p>4. To conduct final disposal of very low-, low- and intermediate-level RAW</p> <p>All short-lived very low-, low- and intermediate-level RAW is planned to be subjected to the final disposal by depositing it into corresponding repositories by 2038. Currently RAW cannot undergo final disposal, because there are no operational repositories: the actions of the programme for the acknowledgement of a very low-level RAW repository as operational and procurement procedures for the construction of a low- and intermediate-level RAW repository are being carried out.</p> <p>The programme for the acknowledgement of a short-lived very low-level RAW repository as operational outlines that equipment tests with the use of RAW are to be carried out in 2021, during which RAW will be deposited into the repository. Approximately 60,000 m<sup>3</sup> of packages are planned to be deposited into this repository by 2038.</p> <p>The programme for the acknowledgement of a short-lived low- and intermediate-level RAW repository as operational outlines that equipment tests with the use of radioactive materials are to be carried out in 2025, during them RAW will be deposited into the repository. Approximately 50,000 m<sup>3</sup> of packages are planned to be deposited into this repository by 2038.</p> <p>Assuming that it is possible to convert the bituminised RAW storage facility into a repository without removing the waste from it, the concept for such conversion is planned to be approved in 2025, and the project – in 2026. The bituminised RAW storage facility contains approx. 14,500 m<sup>3</sup> of bituminised short-lived low- and intermediate-level RAW.</p> <p>The radiation control is planned to be abolished for approx. 30,000 m<sup>3</sup> of waste located in the industrial waste ground (currently classified as very low-level RAW due to the amended waste classification) by 2038.</p>	<p>1. The programme for the acknowledgement of a short-lived very low-level RAW repository as operational has been implemented</p> <p>2. The programme for the acknowledgement of a short-lived low- and intermediate-level RAW repository as operational has been implemented</p> <p>3. The design stage of the bituminised RAW storage facility conversion programme has been implemented</p>	<p>0 %</p> <p>0 %</p> <p>0 %</p>	<p>100 %</p> <p>100 %</p> <p>100 %</p>
<p>5. To conduct final disposal of long-lived RAW (The deep repository location selection research programme is planned to be completed by 2047.</p>	<p>Part of the execution of the deep repository location selection research programme</p>	<p>3 %</p>	<p>30 %</p>

<i>The deep repository is preliminarily planned to be built in 2058–2067, operated in 2068–2074, and closed in 2075–2079)</i>			
6. To create a management model of the RAW generated by small RAW producers after 2038 <i>(A management model of the RAW generated by small RAW producers after 2038 is planned to be created in 2025.)</i>	A management model of the RAW generated by small RAW producers after 2038 is created	0 %	100 %

Implementation measures of the radioactive waste management development program are detailed documents in which are assessed and determined the intended impact of the measures, target group, expected change, activities needed to implement the measures, implementation area, established indicators of the implementation of measures, detailed the required funds according to the sources of financing and clearly defined implementers of the measures. The major activities and result indicators of the Implementation measures:

- To dismantle nuclear power facilities.** The Ignalina NPP manages all nuclear power facilities in the territory of Lithuania, the operation of which must be decommissioned. A part of the equipment of nuclear power facilities, where nuclear fuel has been used during operation, may be dismantled only after unloading the SF and placing it in a specific storage facility. The unloading of SF from the fuel storage pools in the reactor buildings is to be completed by Q3 2022. The dismantling of the nuclear power facilities technological equipment is planned to be completed in 2033. One of the most complex dismantling projects is the dismantling of INPP two RBMK-1500 reactors, implementation of which due to its complexity and importance effects not only the performance schedule of dismantling works, but also determines the duration of INPP decommissioning itself. Only after the completion of the reactor dismantling works it will be possible to carry out the demolition works of the remaining INPP buildings. In the Implementation measure it is foreseen that Ignalina NPP will have prepared a justification of the optimal reactor dismantling scenario, a conceptual reactor dismantling project and an EIA report by 2023, the reactor decommissioning technical design, the safety analysis report and the general data set for the dismantling of the reactor and the management of the generated waste by 2027 and will have started reactor dismantling works until the end of 2030.
- To conduct the primary treatment of RAW.** The primary treatment of RAW is one of the stages of RAW management, during which the waste is shredded, sorted, decontaminated (if possible) in order to create preconditions for its final treatment and disposal, i.e. all waste received after primary treatment needs to be further stored or put in a repository. Because part of the equipment is still in use and the dismantling works are not completed, therefore the sorting and decontamination of waste is not completed and primary treatment of all RAW will continue. In the Implementation measure it is foreseen that Ignalina NPP will perform primary treatment for waste:

Waste class	Planned primary treatment of dismantling waste and waste stored in 155, 155/1, 157, 157/1 storage facilities (without package), m <sup>3</sup>			
	01/01/2020	01/01/2025	01/01/2030	31/12/2038
0 (the waste class is established after primary treatment and radiological measurements are performed)	38 101	69 321	89 940	110 000

Short-lived very low-level RAW (Class A)	9 027	18 129	37 936	53 570
Short-lived low and intermediate level RAW (Classes B+C)	165	870	3 603	7 991
Long-lived low and intermediate level RAW (Classes D+E)	20	596	1 777	5 941

3. **To conduct basic and final treatment of RAW and ensure the storage of all RAW.** Basic and final treatment of RAW envisages the formation of packaging in accordance with the established requirements (for repositories it is the final packaging for which acceptance criteria are established, for storage facilities - requirements for packaging) after the primary treatment of RAW. The basic and final treatment of RAW and its temporary storage is already carried out in the territory of the Republic of Lithuania, as Ignalina NPP has administrative and technical capabilities. It is planned that the proportion of finally treated short-lived radioactive waste packages and long-lived waste packages in 2030 (and in 2038) after the basic treatment will be:
- very low-level radioactive waste packages about 50 % (about 30 000 m<sup>3</sup> – volume of packages) in 2030; in 2038 – 100 % (about 60 000 m<sup>3</sup> – volume of packages);
  - low and intermediate level radioactive waste packages about 50 % (25 000 m<sup>3</sup>) in 2030; in 2038 – 100 % (about 50000 m<sup>3</sup>);
  - long-lived waste packages about 40 % (about 4000 m<sup>3</sup>) in 2030; in 2038 – 100 % (about 10 000 m<sup>3</sup>);
  - the amount of very high-level radioactive waste packages in storage facilities in 2030 (planned in 2022) – 100 % CASTOR (20 units), CONSTOR (98 units) and CONSTOR M2 (190 units).
- Taking into account that some of the INPP dismantling projects are still in the preparation or planning stages, it is envisaged that new storage facilities for long-lived waste will have to be built in case of relevant design decisions. In the Implementation measure it is foreseen that Ignalina NPP will build this missing infrastructure for the storage for this RAW.
4. **To conduct final disposal of very low-, low- and intermediate-level RAW.** The general target of this Implementation measure is preparation for the disposal of INPP RAW (RAW generated during demolition, RAW in storages) and start disposing until the end of 2030. In order to reach this target Ignalina NPP should find solution for the management of Ignalina NPP industrial waste polygon (as it may contain very low level of short-lived radioactive waste), solve issue of turning the Ignalina NPP bituminised waste storage facility into a repository, solve uncertainties regarding the amount of RAW generated during demolition of the nuclear facilities (possible insufficient disposal capacities in the planned repositories) and started operation of the short-lived very low-level RAW repository and short-lived low- and intermediate-level RAW repository.
5. **To conduct final disposal of long-lived RAW.** In the Implementation measure it is foreseen that research and evaluations of the site selection of the deep geological repository for RAW will be carried out. Based on the results of these activities Ignalina NPP will plan the entire further implementation of the deep geological repository for RAW project, therefore, their proper and timely implementation is a prerequisite for the successful implementation of the entire project. It is planned that Ignalina NPP will implement 30% of the deep repository location selection research programme until the end of 2030. In the Implementation measure it is foreseen that Ministry of Energy will evaluate adequacy of accumulation of funds required for the implementation of the entire deep geological repository and prepare adjustments of the legal acts if needed until 2025. It is foreseen measures to disseminate knowledge in the field of RAW safety and to inform the public about management and disposal of RAW.

6. **To create a management model of the RAW generated by small radioactive waste producers after 2038.** RAW collected from small radioactive waste producers (hereinafter referred to as SRWP) by Ignalina NPP will be managed using the available management facilities at Ignalina NPP until 2038. After INPP decommissioning is completed (at the end of 2038) majority Ignalina NPP infrastructure used for the management of the SRWP RW is planned to be dismantled. This raises the issue of production means for collection, transport, primary treatment and management of SRWP RAW. Seeking to create the management model of the RAW generated by SRWP after 2038 it is planned to perform detailed analysis by assessing the future volumes of SRWP RW after 2038, needed infrastructure and other necessary conditions that may be identified during the analysis. It is planned that Ignalina NPP will create Management model of the RAW generated by SRWP after 2038 until the end of 2025.

### ***Article 14.3 – Peer review and self-assessments***

*Article 14.3*

*Member States shall periodically, and at least every 10 years, arrange for self-assessments of their national framework, competent regulatory authority, national programme and its implementation, and invite international peer review of their national framework, competent regulatory authority and/or national programme with the aim of ensuring that high safety standards are achieved in the safe management of spent fuel and radioactive waste. The outcomes of any peer review shall be reported to the Commission and the other Member States, and may be made available to the public where there is no conflict with security and proprietary information.*

The Council Directive 2014/87/Euratom of 8 July 2014 provides that the Member States shall, at least once every 10 years, arrange for periodic self-assessments of their national framework and competent regulatory authorities and invite an international peer review of relevant segments of their national framework and competent regulatory authorities with the aim of continuously improving nuclear safety. Respective provisions are included into the Law on Nuclear Safety.

Integrated Regulatory Review Service (IRRS) Follow-up mission to the Republic of Lithuania took place from the 10<sup>th</sup> of November to the 2<sup>nd</sup> of December 2020. The purpose of the IRRS follow-up mission was to review progress in implementing improvements based on the 27 recommendations and 32 suggestions presented in the 2016 year IRRS mission report. The IRRS follow-up mission has also addressed areas of significant change since the last mission.

Self-assessment was performed and Report on Implementation of Recommendations and Suggestions Received during the IRRS Mission to Lithuania in 2016 was prepared and submitted to the IAEA before start of IRRS Follow-up mission.

57 out of 59 recommendations and suggestions, presented during the initial IRRS mission in 2016, were closed and only 1 recommendation and 1 suggestion remained open after the IRRS Follow-up mission. Three additional recommendations and suggestions were presented (RF1, SF1 and SF2) during the Follow-up mission. RF1 for the area of closure of radioactive waste disposal facilities, SF1 for broadening the range of available guidance for inspection of nuclear facilities, and SF2 related to the amounts of material below which the different concentration values should be used to exempt practices or sources from regulatory control.

Action plan for implementation of the two remaining and the three new recommendations and suggestions is prepared and approved. The State Nuclear Power Safety Inspectorate, The Radiation Protection Centre and The Ministry of Energy are foreseen as responsible institutions for implementation of this action plan.

Report of the IRRS Follow-up mission to the Republic of Lithuania was presented to Lithuanian authorities in January 2021. International Atomic Energy Agency derestricted the Report of the IRRS Follow-up mission and made it public ([https://www.iaea.org/sites/default/files/documents/review-missions/irrs\\_lithuania\\_follow-up\\_report.pdf](https://www.iaea.org/sites/default/files/documents/review-missions/irrs_lithuania_follow-up_report.pdf)) after request of Lithuanian authorities. Report of the IRRS Follow-up mission is presented also at VATESI official internet site [www.vatesi.lt](http://www.vatesi.lt).

It is planned that the Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) mission to Republic of Lithuania was planned at the beginning of 2021 were postponed to IV quarter of 2021 (backup date – II quarter of 2022) due to COVID-19 pandemic situation. Ministry of Energy is responsible authority for the organisation ARTEMIS mission in Lithuania.

## ***Future plans to improve safe and responsible management of spent fuel and radioactive waste***

### *INPP safety improvements*

INPP continuously improves safety of the radioactive waste and SF handling.

The modernization of the radioactive waste handling system includes the change to a new classification, compliant with international standards, and the operation of solid radioactive waste storage and processing facilities. Implementation of commissioning program of solid radioactive waste storage and processing facilities is ongoing and the start of industrial operation is envisaged in 2021. The content of the project for new solid radioactive waste storage and management facility, a retrieval facility (to retrieve waste from the existing storage) and the solid radioactive waste treatment facility, which includes provisions for:

- receipt of retrieved solid radioactive waste (SRW);
- sorting;
- fragmentation;
- compaction of combustible low level SRW;
- combustion of combustible medium and low level waste;
- super-compaction of medium and low level waste;
- compacting in containers;
- cementation;
- decontamination of transport containers;
- measurement and accounting;
- transport system;
- interim storage for the SRW bales;
- management of INPP decommissioning waste.

The other radioactive waste management modernization projects, currently under implementation are:

- Additional investigations shall be performed and a decision shall be taken whether the bituminized radioactive waste storage facility could be converted into a repository or not. Depending on the decision, the bituminized radioactive waste storage facility shall be licensed as a repository or the bituminized waste shall be retrieved and enclosed into suitable containers as required for storage, transport and disposal in the near surface repository.
- Decision about irradiated graphite interim storage will be made in the near future (during the envisaged designing and licensing phase of the project 2103 to be performed by Contractor). Preliminarily, two principal options were considered at INPP: construction of new storage facility to store irradiated graphite only and storage of irradiated graphite in building 158/2.

### *Disposal Facilities*

Construction of Landfill facility for VLLW completed in May 2021. 3 Landfill disposal modules (project B19-2) (each module has capacity of 20000 m<sup>3</sup> of packaged waste or 60000m<sup>3</sup> total capacity of Landfill facility). Equipment tests with the use of RAW (first company) are to be carried out in 2022.



Licence for construction and operation of the near surface repository (NSR) for short-lived LILW was issued in November 2017. NSR at Stabatiškė site will be a hill-type construction located above the ground water with reinforced concrete vaults and engineered low-permeable barriers. Safety of the disposed waste should be ensured by a multiple barrier system as follows: the waste matrix, waste packaging or container, concrete vault and surrounding low permeable clay as well as the natural barrier.

Volume of conditioned waste to be disposed in NSR is 100,000 m<sup>3</sup>. However, the planned repository is a modular type facility, therefore it should be easy to adapt for other disposal volumes by reducing or increasing the number of vaults. As waste disposal in the NSR occurs over a long period of time, for practical and financial reasons the disposal vaults will be built section by section to keep up with the disposal rate. Disposal rate is 2 vaults per year.

Tendering, construction and commissioning of first group of NSR disposal vaults are planned in 2021-2025.

According to the Development Programme and Implementation Measures described in Articles 11 and 12 of this Report, the preparatory steps to the final disposal of spent nuclear fuel are foreseen:

a) selection of the location for the deep geological repository. It is planned that INPP will implement 30% of the deep repository location selection research programme until 2030. The final stage will include an EIA and a comparative analysis of the alternative sites. The specific location will be selected according to technical, social and economic conditions. The deep repository location selection research programme is planned to be completed by 2047.

b) building and commissioning of the deep geological repository and disposal of spent nuclear fuel and long-lived radioactive waste. The construction of the deep repository is preliminarily planned in 2058 following a technical design expertise and safety justification. The construction and commissioning of the deep repository will be completed in 2067.

c) operating of the deep geological repository. It is foreseen that deep repository will be operated from 2068 and long-lived radioactive waste will be disposed in it up to 2074. Finally, deep geological repository will be closed in 2075-2079.