NATIONAL
ATOMIC ENERGY
AGENCY

NATIONAL REPORT OF REPUBLIC OF POLAND ON COMPLIANCE WITH OBLIGATIONS OF THE JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

Polish 8th national report as referred to in Article 32 of the Joint Convention

August 2024

Contents

List of Acronyms

CNSRP	**Council for Nuclear Safety and Radiation Protection**
DRWR	**Deep Radioactive Waste Repository**
DSRS	**Disused Sealed Radioactive Sources**
GTRI	**Global Threat Reduction Initiative**
HASS	**High-Activity Sealed Source**
HEU	**Highly Enriched Uranium**
HLW	**High Level Waste**
IAEA	**International Atomic Energy Agency**
ILW	**Intermediate Level Waste**
IMS	**Integrated Management System**
IPPA	**Project on Implementing Public Participation Approaches in Radioactive Waste Disposal**
LEU	**Low Enriched Uranium**
LL	**Long-lived**
LLW	**Low Level Waste**
LILW	**Low and Intermediate Level Waste**
MoE	**Ministry/Minister competent for Energy matters**
MoC	**Ministry/Minister competent for Climate matters**
National Plan	**National Plan of Radioactive Waste and Spent Nuclear Fuel Management**
NCBJ	**National Centre for Nuclear Research**
NPP	**Nuclear Power Plant**
NRWR	**National Radioactive Waste Repository**
NSRWR	**Near Surface Radioactive Waste Repository**
PAA	**National Atomic Energy Agency**
PPEJ	**Polish Nuclear Power Program**
RR	**Research Reactor**
RRRFR	**Russian Research Reactors Fuel Return**
SSC	**Systems, Structures and Components**
SF/SNF	**Spent Fuel/Spent Nuclear Fuel**
SFA	**Spent Fuel Assembly**
SL	**Short-lived**
ZUOP	**Radioactive Waste Management Plant**

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SECTION A. INTRODUCTION

This Report has been prepared, in accordance with the guidelines established by the Contracting Parties under Article 29.2(iii), to fulfil the obligations of the Article 32 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, signed by Poland on 30 September 1997 in Vienna, and ratified by the President of the Republic of Poland on 9 March 2000. The corresponding instruments of ratification were deposited with the IAEA on 5 May 2000. The Convention entered into force on 18 June 2001.

This Report is the eighth one, following the previous seven national reports, issued in May 2003, October 2005, October 2008, October 2011, October 2014, October 2017 and October 2020 respectively, which were presented at the previous Review Meetings of the Contracting Parties of the Joint Convention held in Vienna in November 2003, May 2006, May 2009, May 2012, May 2015, May 2018 and June 2022, respectively.

The present report is a stand-alone document and has been prepared with the aim to update and supplement the information contained in the previous reports. It focuses on the changes of the legislative framework - implementing into the national laws the provisions of Council Directive 2013/59/EURATOM laying down basic safety standards to protect against risks arising from exposure to ionizing radiation, as well as on the improvements made in the field of policy making since the last review meeting. It refers to the issues suggested at the seventh review meeting to be addressed in the Polish 8th National Report.

Since the last report, the first “Strategy and policy on the development of nuclear safety and radiation protection of the Republic of Poland” was prepared by the Ministry of Climate and Environment, together with the PAA. This strategic document was adopted by the Council of Ministers on 12th April 2022. The main objective of the Strategy is to ensure the protection of people and the environment against the harmful effects of ionizing radiation and to increase the level of nuclear safety and radiation protection in Poland. Four more detailed strategic objectives have also been set

1) development of the national regulatory system for nuclear safety and radiation protection;
2) development of the national radiation monitoring system;
3) strengthening of national competences in the field of nuclear safety and radiation protection;
4) enhancing the research potential and social awareness in the field of nuclear safety and radiation protection.

This document describes the fundamental principle of nuclear safety and radiation protection and provides a course of actions to further improve nuclear safety and radiation protection in the country. One of these actions is the promotion of a safety culture and attitudes that enhance safety culture.

Facilities concerned

Poland has never operated a nuclear power reactor or a nuclear fuel cycle facility, with the exception of a uranium mine. The mining of uranium ore ended in 1968, and the processing was terminated in 1973 and is currently not a source of any new waste. There is no waste from the operation of power reactor or spent fuel reprocessing activities in Poland. Radioactive waste then originates from research reactors, scientific and educational institutions, industry and hospitals. This waste comes from various applications of ionising radiation used in roughly 5000 institutions.

The main institutions involved in radioactive waste management are as follows:

A. National Centre for Nuclear Research (NCBJ)

NCBJ is the operator of the MARIA research reactor, the only Polish operational reactor, located in Otwock. It is a high-flux pool-type reactor with a nominal thermal power of 30 MWt. The MARIA reactor was commissioned in 1974, and was shut down in 1985–1993 for the necessary upgrading which included the installation of a passive core cooling system using water from the reactor pool. From April 1999 to June 2002, gradual conversion of the reactor core was conducted in 106 consecutive reactor fuel cycles, thus reducing the fuel enrichment from 80% to 36% of the U-235 isotope content (HEU – Highly Enriched Uranium). In 2014, as a part of the implementation of the Global Threat Reduction Initiative (GTRI) programme, the MARIA reactor was converted to operate on low enriched uranium (LEU) fuel with a U-235 isotope content of less than 20%.

The first research reactor “EWA” (pool type) 10 MWt (first criticality date 1958/06/14), used for isotopes production and physical experiments in horizontal channels, was shut down and the fuel was removed in 1995. The decommissioning of reactor, which started in 1997, reached the status referred to as “end of phase two” in 2002. This means that the nuclear fuel and all irradiated structures and components, the activity of which could have been hazardous from the perspective of radiological protection, have been removed from the reactor. As a result, the EWA reactor does not release any radioactive substances into the environment. The reactor building has been repaired and the offices have been adapted for use by the Radioactive Waste Management Plant.

B. Radioactive Waste Management Plant (ZUOP)

Low- and intermediate-level radioactive waste produced in Poland, is processed and stored by the State-owned public entity “Radioactive Waste Management Plant” – ZUOP. ZUOP is the operator of following facilities located in Otwock and Różan:

i. Spent nuclear fuel storage facilities No 19 and 19A – located in Otwock

Facility No. 19 was used to store the encapsulated spent low enriched nuclear fuel EK-10 from the EWA reactor, which was shipped to the country of origin (i.e. the Russian Federation) in September 2012.

This facility is now used for storage of some solid radioactive waste (structural elements) from the decommissioning of the EWA reactor and the operation of the MARIA reactor, as well as disused high-activity gamma radiation sources.

The basic element of the storage facility is a concrete body in which four cylindrical chambers are inserted in the square net. The chambers are lined with stainless steel, and inside there are storage facilities with separators for suitable placement of spent nuclear fuel elements.

Facility No. 19A was used for the storage of spent highly enriched nuclear fuel marked WWR-SM and WWR-M2 from the operation of the EWA reactor in the years 1967–1995, as well as the spent encapsulated MR nuclear fuel from the operation of the MARIA reactor in the years 1974–2005. As all spent nuclear fuel from the storage No. 19A was shipped back to the Russian Federation in 2010, the storage is currently used as a backup for the storage of spent fuel from the MARIA reactor in case of emergency.

At present, no spent nuclear fuel assemblies are stored infacilities No. 19 and 19A. Under the GTRI programme all HEU spent nuclear fuel has been shipped back to the Russian Federation.

ii. Radioactive waste management facilities – located in Otwock

Treatment and storage of liquid and solid LILW: evaporation facility and membrane separation facility, chemical treatment facilities (liquid waste), cementation unit, hydraulic press (12 tons), storage facility, class I, III and Z radiochemical laboratories depending on type of activity and activity of groups of radioisotopes.

iii. National Radioactive Waste Repository (NRWR) – located in Różan

The National Radioactive Waste Repository in Różan (Maków District) is the site for disposal of radioactive waste in Poland. The NRWR is a near-surface type repository, designed for the disposal of SL LILW (with a radionuclide half-life of less than 30 years). It is also used to store LL mainly alpha radioactive waste, awaiting to be placed in a deep geological repository. The NRWR has been in operation since 1961, and it is the only facility of its kind in Poland.

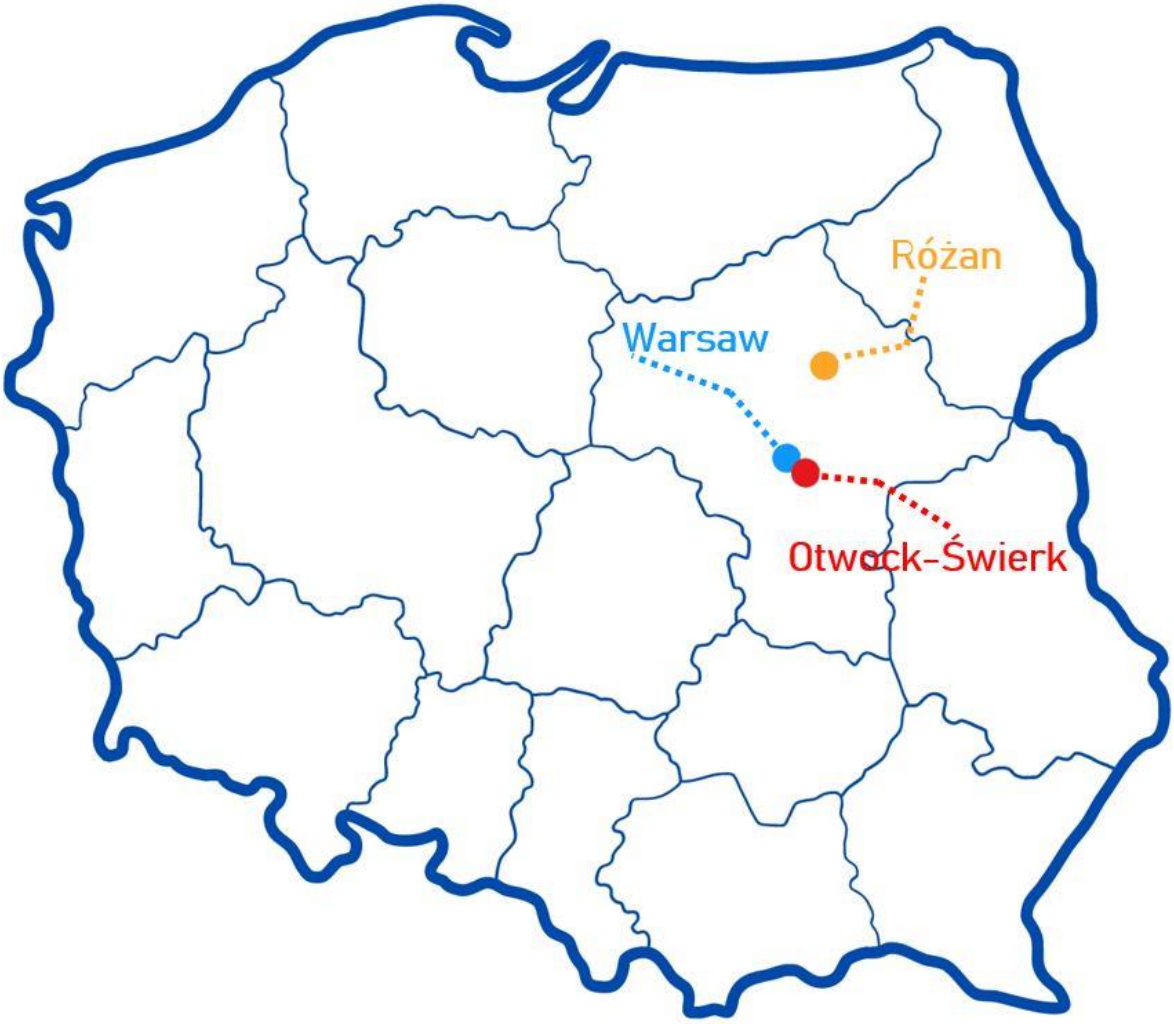

Fig. 1. Location of nuclear site and radioactive waste repository in Poland.

Contributors to the Poland's National Report

The National Atomic Energy Agency (PAA) prepared this report with and incorporating contributions from:

- Department of Nuclear Energy, **MoE, currently Ministry of Industry,**

- Radioactive Waste Management Plant,
- National Centre for Nuclear Research.

Conclusions of the 2022 review meeting

Within the Country Group No. 2 at the 7th Review Meeting, many issues related to both spent nuclear fuel and radioactive waste management emerged and were discussed. No suggestions and good practices were identified at the 7th Review Meeting. One area of good performance was identified at the 7th Review Meeting. As a general observation, the Country Group was satisfied with the answers and believes that Poland met the obligations of the Joint Convention. During the discussion following the National Presentation, there were no points of disagreement. At the end of the review meeting, the following challenges were identified:

1) When new technologies are selected, revise spent fuel and radioactive waste management practices to remain fit for purpose,
2) Management of research reactor spent fuel after short-term storage in unplanned circumstances.

Actions taken in relation to the above challenges and their status are discussed in this report.

SECTION B. POLICIES AND PRACTICES

This section covers the obligations under Article 32 (Reporting), paragraph 1.

Text of Article 32:

In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address its:

i. **spent fuel management policy;**
ii. **spent fuel management practices;**
iii. **radioactive waste management policy;**
iv. **radioactive waste management practices;**
v. **criteria used to define and categorize radioactive waste.**

In Poland, the national policy for the management of radioactive waste and spent nuclear fuel is defined by the Act of 29 November 2000 – Atomic Law (2023 OJ Item 1173, as amended). The details of the policy are set out in the National Plan for the Management of Radioactive Waste and Spent Nuclear Fuel (the National Plan), the update of which was adopted by Council of Ministers' Resolution No. 154 of 21 October 2020. The update makes the data of the activities more realistic and is connected with the update of Energy Policy up to 2040 and the update of Polish Nuclear Power Program. The National Plan has been prepared in fulfilment of the obligation imposed on the Minister in charge of Energy by Art. 57c of the Act – Atomic Law and the Council Directive 2011/70/Euratom establishing a Community framework for responsive and safe management of spent fuel and radioactive waste.

The National Plan is a strategic tool that makes it possible to define all the necessary actions and designate tasks that will lead to the achievement of the objectives of the national policy concerning management of radioactive waste and spent nuclear fuel. In order to do that the National Plan identifies new needs and sets objectives of further works. It also provides and overview of the existing and new methods of radioactive waste and spent nuclear fuel management, the existing and future infrastructure for such management, including the existing division into categories, as well as the quantities of waste collected to date and their forecast future supply. The National Plan also aims to ensure consistency in the management of these substances and to optimize the development and use of the resources for radioactive waste and spent nuclear fuel management. The National Plan is the result of cooperation between all institutions involved in radioactive waste and spent nuclear fuel management, taking into account the experience of other countries.

In accordance with the provisions of the Directive and the Atomic Law Act, Poland is obliged to submit its radioactive waste and spent nuclear fuel management system to an international review. At the invitation of the Minister of Energy, experts from the International Atomic Energy Agency (IAEA) reviewed the Polish radioactive waste management system as part of the ARTEMIS mission. The ARTEMIS mission is based on the Agency's safety standards and guidelines as well as on good practices from around the world. Its purpose was to assess compliance with of EU requirements for independent review of the national radioactive waste management system. The IAEA mission was in Poland from 1st to 10th of October 2017. The mission confirmed that Poland implemented most of the elements required in the National Plan for the management of radioactive waste and spent nuclear

fuel, in particular the Mission's recommendations have been included in the activities envisaged by the update of the National Plan.

Spent fuel management policy

The management of spent nuclear reactor fuel, i.e. all practices involving reprocessing, handling, storage or disposal of spent nuclear fuel, including facility decommissioning, is permitted after implementation of the measures defined in the relevant regulations, to ensure the safety and protection of human life and health, as well as the protection of property and the environment. This rule applies in particular also to the long-term management and final disposal of the spent fuel already accumulated from the operation of research reactors and which may arise from the nuclear programme in Poland.

The development of technologies and capacities for long-term management, including final disposal on Polish territory, is the responsibility of the Government and is a primary objective of the spent fuel management strategy (see Annex I).

At present, MoE is preparing the update of the National Plan and the Polish Nuclear Power Program. The important change will be including in both documents all current developed nuclear projects.

Global Threat Reduction Initiative – Russian Research Reactors Fuel Return Program

In accordance with the Global Threat Reduction Initiative, preparations for the return of HEU-type spent nuclear fuel to the Russian Federation began in 2007 with the financial and logistical support of the US Government. The shipment program was prepared by the Interministerial Team for Coordinating Tasks Connected with the Performance by the Republic of Poland of „the International Research Reactor Fuel Return Program supplied by Russia", established on the basis of Ordinance No 132 of the Prime Minister of 14 November 2007. This team was headed by the President of the PAA. The implementation of the program started in 2009 and by the end of 2016 there were 8 shipments of highly enriched (i.e. exceeding 20% U-235) spent nuclear fuel from the Polish research reactors EWA and MARIA to the Russian Federation. All the shipments were carried out on schedule and without incident. Detailed information on each shipment can be found in the previous National reports.

Spent fuel management practices

In Poland, spent nuclear fuel (SNF) was generated from the operation of two research reactors (RR) named EWA and MARIA. The EWA RR was in operation for 37 years. The reactor was shut down in 1995 and is undergoing decommissioning. During operation of both research reactors, various types of fuel were used: EK-10 fuel type (LEU) in 1958 – 1967, WWR-SM fuel type (HEU) in 1967 – 1995 and WWR-M2 fuel type (HEU) in 1990 – 1995. The WWR-SM and WWR-M2 fuel was constructed in the form of single or triple fuel assemblies (SFA). Since the last review meeting, spent nuclear fuel has been generated from the operation of MARIA RR. From 2009 to December 2023, 146 LEU fuel assemblies (MC-5, MR-6, MR-2) have been introduced to the MARIA RR reactor core, of which 138 were removed by December 2023 before reaching 60 % burnup and are now stored in the MARIA reactor technological pool. From July 2020 to December 2023, 43 LEU fuel assemblies (MR-6 – 35FA, MR-2 – 1FA. and MC-5 – 7FA) have been introduced to the reactor core, of which 44 (MR-6 – 39FA and MC-5 – 5 FA) were removed by December 2023 before reaching 60 % burnup and are now stored in the MARIA reactor technological pool. Currently, 91 LEU (MC-5) spent nuclear fuel elements and 47 LEU (MR-6) spent fuel elements are stored in the MARIA reactor technological pool.

The scope of the management of spent fuel elements from the MARIA reactor includes, inter alia:

- spent fuel element operations, including monitoring and containment,
- storage of spent fuel elements in the reactor technological pool, including records of spent fuel elements,
- monitoring the condition of the spent fuel elements, including maintaining the proper chemical composition of the water in the reactor pools in order to minimize the corrosion rate of the cladding of the spent fuel elements,
- radiation protection during work with spent fuel elements.

Radioactive waste management policy

The radioactive waste system in Poland is based on the following rules:

- design, construction, operation and decommissioning of the facilities, ensuring nuclear safety and radiological protection;
- minimization of the quantity, volume, and activity of radioactive waste, as well as sorting, classification, processing, packaging, and appropriate labelling of packaged radioactive waste, taking into account its composition;
- 'the polluter pays' principle;
- application of a decision-making process based on the evidence and documents at all stages of radioactive waste and spent nuclear fuel management;
- application of an open fuel cycle and monitoring of trends in the field of fuel cycle. If economic and technical conditions favorable to the introduction of a closed cycle arise, the validity and advisability of its introduction in Poland will be analyzed;
- monitoring of radioactive waste and spent nuclear fuel storage, disposal, and transport;
- a ban on the entry of radioactive waste to Poland for storage and export, with the exception of export to the country, with which an agreement on radioactive waste disposal in radioactive waste repositories has been concluded;
- application of the attitude to radiation hazards and emergency management as well as crisis management consistent with international standards;
- continuous training of personnel to ensure safety in management of radioactive waste and spent nuclear fuel;
- development of training and information activities;
- transparency of the activities carried out and provision of information to the public;
- ensuring public participation in decision-making;
- permanent cooperation with international organizations and institutions involved in radioactive waste and spent nuclear fuel management;
- application of the state-of-the-art achievements of science and technology in the field of radioactive waste and spent nuclear fuel management.

Radioactive waste management practices

According to art. 48a of the Atomic Law Act organizational entity in which the waste is produced is responsible for ensuring the possibility of managing radioactive waste. After collection and transport to Otwock, the responsibility for all radioactive waste management is taken over by the Radioactive Waste Management Plant (ZUOP). The diagram of the radioactive waste management system is shown in Fig. 2. ZUOP is responsible for the collection, segregation, treatment, conditioning and storage/final disposal of all radioactive waste arising in the country. It is also in charge of the transport of conditioned waste to the National Radioactive Waste Repository in Różan and for the operation of the repository. Waste producers are responsible for the proper segregation and categorization of waste before it is collected by ZUOP.

R&D in the field of radioactive waste management is carried out by various research groups at NCBJ and other scientific institutes.

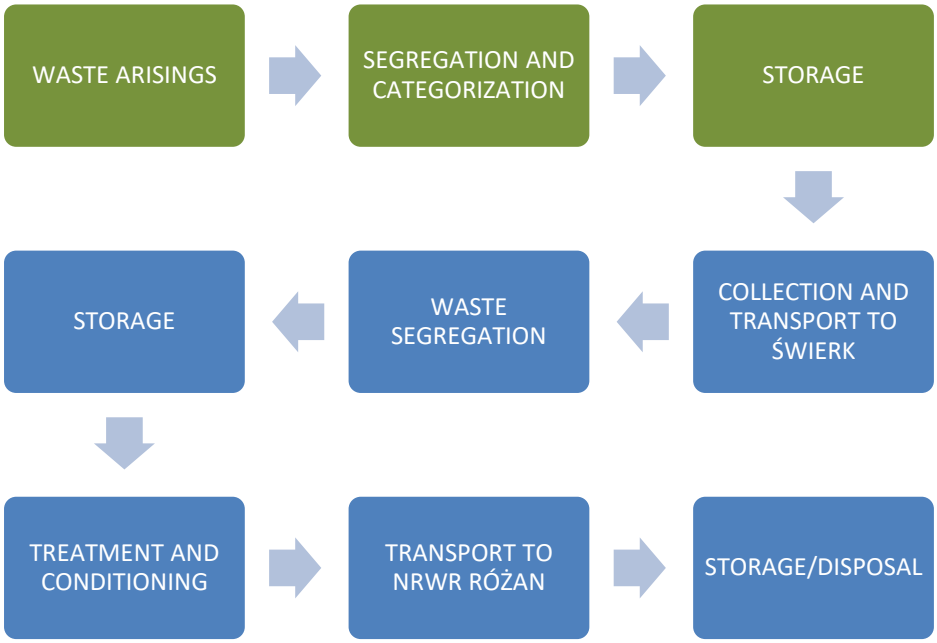

Fig. 2. The diagram of the radioactive waste management system in Poland (green-radioisotopes users, blue - ZUOP).

Waste arisings

Currently, radioactive waste in Poland, comes from:

- the MARIA research reactor,
- scientific and educational institutions, industrial organizations and hospitals.

More than five thousand radiation sources users are scattered throughout the country. Only low- and intermediate-level waste is produced. Most of the spent high-activity gamma sources are returned to the supplier abroad, but a number of them, mainly of Soviet origin, still remain on the user's premises, or are stored at ZUOP storage facilities in Otwock .

Waste treatment and conditioning

ZUOP owns three systems for liquid radioactive waste volume reduction. Currently, two of them are in operation: evaporation method and the reverse osmosis method. However, the third system - volume reduction system with using synthetic inorganic sorbents ($BaCO_3$ and $K_4[Fe(CN)_6]$) is maintained to be ready for use if needed.

The 3-stage reverse osmosis unit, JP3RO, consists of two different types of membranes: Toray TM 820K-400 and Toray TM 810V. The JP3RO unit can be used independently to purify low-salt effluents, mainly water from the primary reactor circuit, or it can be combined with the evaporator.

Liquid ILW and waste arising from decontamination is evaporated.

All liquid radioactive waste is solidified in cement after volume reduction.

Solid waste is segregated. Approximately 60% of the total waste volume is compacted using a hydraulic press. Volume reduction factors obtained range from 3 to 5, depending on the type of waste. Ion-exchange resins are conditioned by dewatering and solidification. The solid and conditioned waste is packed in standard 200 dm^3 metal drums, which are zinc-plated or varnished on both sides.

Radium sources were immobilized with glass in brass containers. The brass containers were then placed in the storage containers and transported to the repository. A

storage container for spent radium sources is shown in Fig.3. Due to the lack of such waste, this technology is not currently in use.

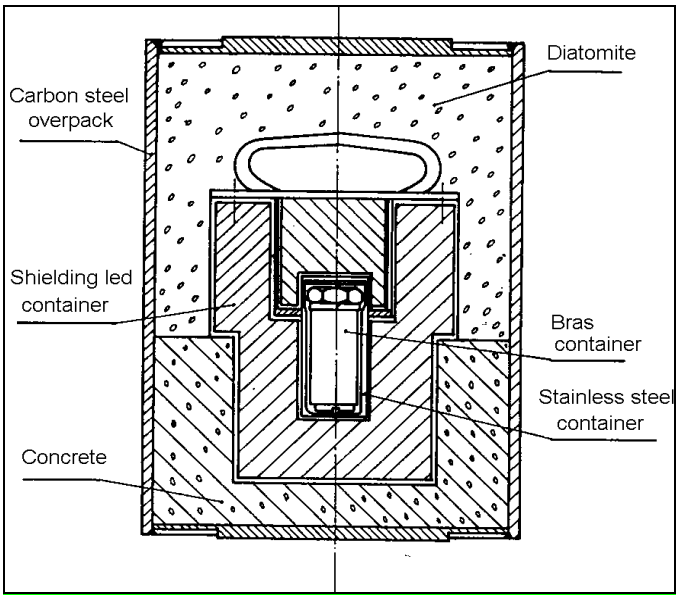

Fig. 3. Storage container for spent radium sources.

Smoke detectors containing americium sources or older types containing plutonium sources are dismantled and the sources are immobilized in 1 dm^3 metal cans using polyester resin. The metal cans are then placed in 50 dm^3 zinc-plated or varnished on both sides metal drums and grouted with concrete.

Waste storage and disposal

ZUOP operates one storage facility (No. 93) in Otwock for SL and LL waste and DSRS and two storage facilities (No. 35A and No. 35B) for liquid waste. In addition, the spent fuel storage facility (No. 19) is used to store solid radioactive waste from the decommissioning of the EWA reactor and from the operation of the MARIA reactor, as well as spent high-activity gamma sources and neutron sources.

The National Radioactive Waste Repository (NRWR) in Różan is a surface type repository, which serves as the first and only radioactive waste repository in the country and has been in operation since 1961. It is used for the disposal of LILW containing SL radioisotopes and for the storage of LL waste.

Criteria used to define and categorize radioactive waste

In accordance with art. 47 of the Atomic Law Act radioactive waste is classified into three categories according to the concentration of radioactive isotopes contained in the waste: low-, intermediate- and high-level radioactive waste. These categories are further divided into subcategories according to the half-live of the radioactive isotopes and the concentration of the radioactive isotopes contained in the waste. Liquid waste is additionally classified according to its activity concentration. Spent nuclear fuel intended for disposal is classified as a high-level radioactive waste.

Disused (spent) sealed radioactive sources form an additional category of radioactive waste. These sources are classified according to their activity level into the following subcategories of spent sealed radioactive sources: low-, intermediate- and high-level, which

are further divided into short-lived and long-lived subcategories according to the half-life of the radionuclides they contain.

Table 1. Radioactive Waste Classification

Category		Subcategory		
		Transitional	Short-lived	Long-lived
LLW	$EAC < A \leq 10^4$ EAC	Activity concentration of isotopes is to fall below the level specified for low-level waste after 3 years[1]	$t^{1/2} \leq 30$ years $A \leq 400$ kBq/kg for long-lived isotopes	$t^{1/2} > 30$ years $A > 400$ kBq/kg for long-lived isotopes
ILW	10^4 EAC $< A \leq 10^7$ EAC			
HLW	$A > 10^7$ EAC			

Disused sealed radioactive sources form an additional radioactive waste category and depending on the level of their activity, shall be classified into the following subcategories: low-level, intermediate-level and high-level disused sealed radioactive sources, which shall be further subdivided according to the half-lives of contained radioactive isotopes into short-lived and long-lived subcategories.

[1] Isotope activity and concentration thresholds for the classification of waste as radioactive waste are specified in Annex II

Table 2. DSRS classification

<table>
<tr><td rowspan="2">Disused sealed radioactive sources[2]</td><td colspan="3">Sub-category</td><td rowspan="2"></td></tr>
<tr><td>Low-level</td><td>Intermediate-level</td><td>High-level</td></tr>
<tr><td rowspan="2">EA < A ≤ 10^8 Bq</td><td rowspan="2">10^8 < A ≤ 10^{12} Bq</td><td rowspan="2">A >10^{12} Bq</td><td>Short-lived
$t_{1/2}$ ≤ 30 years</td></tr>
<tr><td>Long-lived
$t_{1/2}$ > 30 years</td></tr>
</table>

A – activity concentration of the in-source isotope (kBq/kg) or the activity of the in-source isotope (Bq),
EAC – isotope activity concentration threshold for waste attribution to the category of radioactive waste (kBq/kg),
EA – activity threshold for waste attribution to the category of radioactive waste (Bq).

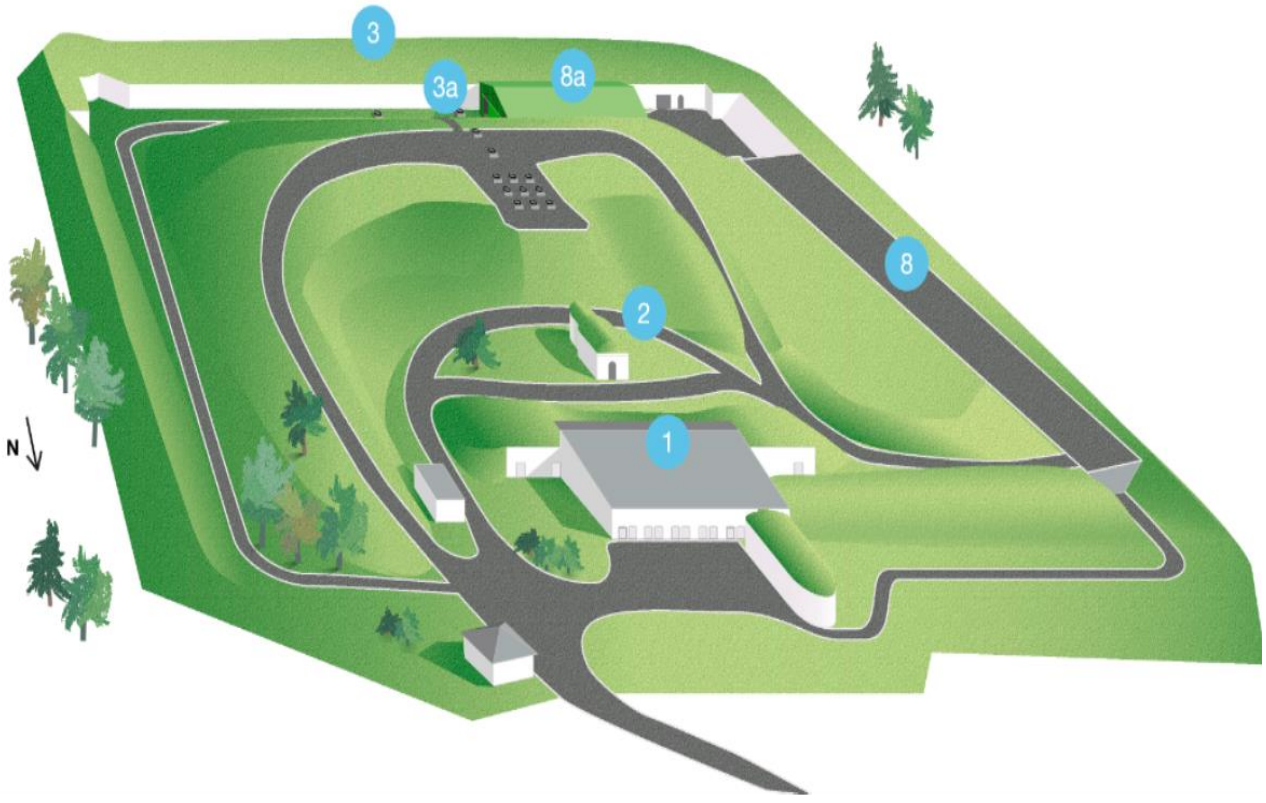

Fig. 4. National Radioactive Waste Repository in Różan.

[2] DSRS form a separate category of radioactive waste.

SECTION C. SCOPE OF APPLICATION

This section covers the obligations under Article 3.

Text of Article 3:

1. **This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.**
2. **This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.**
3. **This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.**
4. **This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.**

Poland has not declared reprocessing as a part of spent fuel management in accordance with Article 3(1).

No waste containing only naturally occurring radioactive material and not originating from the nuclear fuel cycle has been declared by Poland as radioactive waste for the purposes of the Convention in accordance with Article 3(2).

Neither spent fuel nor radioactive waste from military or defence programmes has been declared in Poland as spent fuel or radioactive waste for the purposes of the Convention, pursuant to Article 3(3).

SECTION D. INVENTORIES AND LISTS

This section covers the obligations under Article 32 (Reporting), paragraph 2.

Text of Article 32, paragraph 2:

This report shall also include:

i. **a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;**

ii. **an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;**

iii. **a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;**

iv. **an inventory of radioactive waste that is subject to this Convention that:**

   f. **is being held in storage at radioactive waste management and nuclear fuel cycle facilities;**

   g. **has been disposed of; or**

   h. **has resulted from past practices.**

   This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;

v. **a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.**

List of spent fuel facilities

- spent fuel storage facility No. 19 (wet storage),
- spent fuel storage facility No. 19A (wet storage),
- technological pool of MARIA RR.

All of the above facilities are located in Otwock. Spent fuel storage facilities are operated by the Radioactive Waste Management Plant. The technological pool of MARIA Research Reactor is also located in Otwock and is operated by the National Centre for Nuclear Research.

The spent fuel storage facility No. 19 consists of 4 cylindrical ponds placed in an underground concrete structure. Currently, the facility is used as a place to store some solid radioactive waste from the decommissioning the EWA reactor and from the operation of the MARIA reactor, as well as spent high-activity gamma radiation sources. The facility has been in operation since 1958. Currently, there is no spent fuel in the facility No. 19.

The spent fuel storage facility No. 19A consists of a semi-underground reinforced concrete structure with two rectangular ponds. Each pond is lined with 6 mm stainless steel sheet, which was installed in 1999-2000. The facility is equipped with a crane with a lifting capacity of 10 tons and with a device for handling of spent fuel. Both ponds can be used for SFAs storage. This storage facility was used as a backup for the purpose of spent fuel storage from the MARIA reactor in case of emergency. There is currently no spent fuel in the facility No. 19A.

MARIA reactor's technological pool is mainly used to store spent MR fuel and also MC fuel (as a result of the conversion of the reactor core) from the current reactor operation, which requires a suitable cooling time before the spent fuel is shipped to another location.

Spent fuel inventory

As of 31th December, 2023, 138 SFAs including MR-6 and MC-5 fuel types are stored in the MARIA RR technological pool. The characteristics of the spent fuel currently stored in the MARIA RR technological pool are given below.

Table 3. Spent fuel from Polish research reactor MARIA (31.12.2023)

Parameter	Fuel Type		
Fuel Type	MC-5 (LEU)	MR-6 (LEU)	MR-6 (LEU)
Fuel Operation	2009-2020	2018-2023	2013-2014
Number of fuel assemblies	91 (44120,43 g)	45 (22306,1 g)	2 (978,9 g)
Dimensions: Length, Diameter	1315 70 mm	1478* 70 mm	1380 70 mm
Fuel composition	U_3Si_2 in Al	UO_2 in Al	UO_2 in Al
Cladding Material Thickness	0.4-0.6	0.4-0.6	0.4-0.6
Initial % U-235	19.75	19,70	19.70
Average burn-up	60% max	60% max	60% max
Cooling time (years)	0-14	0-5	9-10
Mass U-235 in single element (g)	485	496	489,5

* the total length of the element

List of radioactive waste management facilities

The Radioactive Waste Management Plant operates the following waste management facilities:

- **Radioactive liquid waste storage capacities (building no. 35 A and 35 B):**
  - 1 tank – 300 m^3 for low-level waste,
  - 6 tanks – 50 m^3 for intermediate-level waste,
  - 2 tanks – 4 m^3 for liquid waste from decontamination,
  - 3 tanks – 1,6 m^3 for liquid iodine waste,
  - 4 tanks – 0,25 m^3 for liquid transitional waste.
- **Radioactive Waste Treatment Station (building no. 35) is equipped with:**

- evaporator: 300 dm^3/h evaporated water, natural circulation, steam heating,
- chemical treatment station: 1200 m^3/y,
- reverse osmosis: 1 m^3/h,
- compactor - hydraulic press – 12 T, volume reduction factor 3-5, 10 drums of 200 dm^3 each per shift,
- solidification installation– 8 drums of 200 dm^3 per shift,
- two third class laboratories dedicated for working with strictly defined activity of groups of radioisotopes

- **Radioactive waste storage facility (building no. 93) is used for storage of:**
  - untreated solid waste,
  - conditioned waste awaiting shipment to the National Radioactive Waste Repository,
  - smoke detectors,
  - waste for decay,
  - DSRS in shielding containers,
  - nuclear materials.
- **Spent fuel storage facility (building no. 19) is used for:**
  - storage of solid waste from the decommissioning of the EWA research reactor and from the operation of the MARIA research reactor,
  - disused gamma HASS,
  - neutron DSRS.
- **Building R1 (EWA research reactor – undergoing decommissioning)**
  - first class laboratory dedicated to work with strictly defined activity of groups of radioisotopes,
  - Z class laboratory where devices containing radioactive sources are in operation,
  - shredding unit for uncontaminated elements from dismantled smoke detectors.
- **National Radioactive Waste Repository – in Różan (NRWR)**

The Różan site is a near-surface type repository covering 3.045 ha, in operation since 1961 and it is the only repository in Poland. The repository is located at a former military fort constructed between 1905 and 1908. The concrete structures and part of the dry moat surrounding the repository are used as storage or disposal facilities.

The following facilities located in the NRWR area are currently in use (see Fig. 4):

1. no. 1 (partially) – storage of SL and LL LILW, storage of SL and LL LIL DSRS,
2. no. 3a – disposal of SL LIL DSRS,
3. no 8 – disposal of SL LILW,
4. no 8a – storage of SL and LL LILW, disposal of SL LILW.

Legacy SL and LL LILW waste (non-segregated, only partially conditioned and packaged) are stored in the facilities no 1, 2, 3.

The closure of the NRWR in Różan will be preceded by the extraction of waste from facilities no. 1, 2 and 3. SL waste will be retreated and disposed of in a new LILW repository. LL waste will be transferred to a new LILW repository or storage facility for further storage. An initial concept for the retrieval and treatment of legacy waste has recently been prepared.

LL LILW will be stored until a deep geological repository becomes operational.

Radioactive waste inventory

Waste stored at radioactive waste management and nuclear fuel cycle facilities operated by ZUOP**:**

Table 4. Nuclear materials stored at the National Radioactive Waste Repository in Różan (1.01.1961 – 31.12.2023).

Nuclear materials	Mass
Sources Pu-Be	42,6 g
Depleted U	3 504,2 kg

Table 5. Waste disposed or stored at the National Radioactive Waste Repository in Różan (1.01.1961 – 31.12.2023).

Facility No.	Volume [m^3]	Activity on 31.12.2023 [GBq]	Waste Category
1	807,9	12 908	SL and LL LILW
2	47,0	341	
3	530,5	2 255	
8a	48,8	720	
3a	1,9	4 336	SL LIL DSRS
8	2 768,4	23 210	SL LILW
TOTAL	4 204,0	43 770	-

For the activity of particular isotopes present in the waste stored/disposed at the NRWR Różan during the period of time 01.01.1961 – 31.12.2023, see Annex III.

Table 6. Isotopes activity in solid waste stored in storage facilities of Radioactive Waste Management Plant in Otwock.

Isotope	Initial activity [MBq]	Activity on 31.12.2023 [MBq]
H-3	1 772 039 799	1 250 823 982
Co-60	1 887 078	1 225 164
U-238	120 362	120 362
Ru-106	2 318 208	74 053
Cs-137	31 793	28 140
C-14	11 677	11 664
Ce-144	493 358	5 701
Sr-90	3 051	2 776
S-35	822 473	2 392
Eu-152	1 737	1 522
Ni-63	506	478
Co-57	8 108	415
Ra-226	394	393
Cs-134	3 586	373
Th-232	77	77
U-235	74	74
Tc-99	72	72
Zn-65	24 716	67
Ag-110m	200	57
Am-241	57	56
Te-121m	61 330	53
U-234	39	39
Mn-54	829	22
Sb-125	45	21
Te-123m	70 677	17
Eu-154	22	16
Te-127m	72 735	15
K-40	8	8
other	32 754 834	20
Total	**1 810 727 844**	**1 252 298 027**

Table 7. Types of waste stored in storage facilities of Radioactive Waste Management Plant in Otwock.

No.	Waste	Volume [m^3]	Initial activity [GBq]	Activity on 31.12.2023 [GBq]
1	smoke detectors	44,7	7,1	6,8
2	transitional waste	46,8	488,5	0,1
3	other	44,2	1 810 239,3	1 252 298,0
4	**Total:**	**135,7**	**1 810 734,9**	**1 252 304,9**

Category of waste: SL LL LLW and transitional waste. Type of waste: smoke detectors which are yet not processed, metal scraps contaminated with Ra-226, transitional waste (mainly from medicine) and waste not processed yet.

Table 8. DSRS stored in storage facilities of Radioactive Waste Management Plant in Otwock.

No.	Source	Items	Initial activity [MBq]	Activity on 31.12.2023 [MBq]
1	Cs-137	1	312 790 000	202 842 392
2	Co-60	35	324 860 000	62 680 889
3	Co-60	1	170 600 000	40 767 640
4	Cs-137	1	39 600 000	39 141 695
5	Cs-137	1	39 400 000	37 181 571
6	Cs-137	1	39 405 000	36 488 609
7	Co-60	1	174 000 000	35 334 260
8	Cs-137	1	34 840 000	33 127 521
9	Co-60	1	164 400 000	32 122 881
10	Cs-137	1	34 100 000	32 082 941
11	Cs-137	1	32 000 000	30 915 380
12	Cs-137	1	32 000 000	30 791 131
13	Cs-137	1	31 200 000	30 045 920
14	Cs-137	1	29 200 000	29 040 586
15	Cs-137	1	30 300 000	28 747 294
16	Cs-137	1	29 720 000	28 305 453
17	Co-60	1	112 800 000	26 916 592
18	Co-60	1	135 000 000	26 454 380
19	Co-60	1	169 050 000	19 308 361
20	Co-60	1	170 000 000	17 745 197
21	Co-60	1	198 900 000	15 865 029
22	Co-60	1	101 306 000	15 737 121
23	Co-60	1	58 500 000	15 557 551
24	Co-60	1	124 550 000	14 625 686
25	Co-60	1	177 600 000	14 212 045
26	Co-60	1	152 500 000	14 089 137
27	Co-60	1	169 000 000	13 572 638
28	Co-60	1	93 400 000	13 250 305
29	Co-60	1	25 500 000	13 145 481
30	Co-60	1	88 140 000	8 276 092
31	Co-60	1	42 600 000	4 228 111
32	Co-60	1	35 520 000	3 917 717
33	Co-60	14	15 720 000	3 681 553
34	Ra-Be	2	3 108 000	3 103 624
35	Ra-Be	2	2 616 000	2 612 316
36	Ra-Be	2	2 578 000	2 574 370
37	Co-60	1	3 814 000	2 512 585
38	Co-60	1	3 814 000	2 512 585
39	Co-60	1	3 575 000	2 355 137
40	Co-60	14	6 670 000	1 562 084
41	Cs-137	1	1 534 000	1 049 973
42	Cs-137	1	1 534 000	1 049 973
43	Co-60	1	1 040 000	551 203
44	Co-60	1	1 360 000	105 893
45	Co-60	1	1 170 000	87 529
		Total:	**3 421 314 000**	**990 276 432**

Category of waste: SL HL DSRS

Table 9. Nuclear materials stored in storage facilities of Radioactive Waste Management Plant in Otwock.

No.	Nuclear materials	Mass
1	Sources Pu-Be	704,2 g
2	Depleted U	8 911,2 kg
3	Th (chemical compounds)	1,3 kg
4	U nat (chemical compounds)	3,3 kg

Category of waste: LL LLW

Nuclear facilities in the decommissioning process

The only facility being decommissioned so far is EWA RR. Comprehensive description of the decommissioning process (including a detailed timetable) has been presented in previous national reports. In this edition, only a brief summary of the activities carried out in the years 1997-2001 is presented.

Poland has adopted the 3 stages of decommissioning procedures in accordance with previous IAEA recommendations:

- Stage 1 - safe enclosure with surveillance (“cooling” of contaminated and irradiated materials),
- Stage 2 - restricted site release (dismantling of contaminated and irradiated installations),
- Stage 3 - unrestricted release of the site.

Stage 1 and 2 of the decommissioning of the EWA research reactor have been successfully completed.

Currently, the EWA RR building is used as the headquarters of the RWMP. Additionally the ZUOP’s technical infrastructure, such as class I laboratory, class Z laboratory and shredding unit are located in this building.

SECTION E. LEGISLATIVE AND REGULATORY SYSTEM

This section covers the obligations under the Articles 18, 19 and 20 and summarizes the legislative and regulatory system existing in Poland, including national safety requirements, the licensing system, the inspection, assessment and enforcement process and the allocation of responsibilities for the safety of spent fuel management and radioactive waste management. The considerations in deciding whether to regulate radioactive materials as radioactive waste are addressed.

ARTICLE 18 – IMPLEMENTING MEASURES

Text of Article 18:

Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention

Poland, being a Member State of the IAEA since the ratification of its Statute in 1957, has become a Party to several international conventions and agreements important for the safe use of atomic energy and the safeguards of nuclear material. Once signed and ratified, they became a crucial segment of the legal framework for nuclear activities in Poland, including the management of spent nuclear fuel and radioactive waste resulting from such activities. These international requirements have been incorporated into national legislation and appropriate administrative measures and procedures have been established for their implementation. The updated list of the international nuclear safety instruments (treaties, conventions and agreements) both bilateral and multilateral, to which Poland is a Party, is attached (see Annex V).

The national legislative and statutory framework that regulates the safety of facilities and activities has been established in Poland and is described in Article 19. The President of National Atomic Energy Agency (PAA) as the Regulatory Body for nuclear facilities and activities, is effectively and organizationally independent from bodies charged with the promotion of the nuclear technologies or responsible for facilities or activities in the field of spent fuel and waste management.

ARTICLE 19 – LEGISLATIVE AND REGULATORY FRAMEWORK

Text of Article 19:

1. **Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.**
2. **This legislative and regulatory framework shall provide for:**
   - **(i) the establishment of applicable national safety requirements and regulations for radiation safety;**
   - **(ii) a system of licensing of spent fuel and radioactive waste management activities;**
   - **(iii) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;**

(iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;

(v) the enforcement of applicable regulations and of the terms of the licences;

(vi) a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.

3. When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.

National safety requirements

The Act of Parliament on Atomic Law of 29 November 2000, which has been enforceable since 1 January 2002 (OJ from 2023 Item 1173, as amended), introduced a consolidated system ensuring nuclear safety and radiological protection in Poland. A summary of the Atomic Law is presented in Annex V.

It should be emphasized that all requirements of the Atomic Law Act and secondary legislations are in line with international standards, especially the recommendations of IAEA documents – Safety Fundamentals, Safety Requirements and Safety Guidances. In some cases, these requirements are adopted to the Polish conditions.

The Atomic Law Act is a stand-alone piece of legislation regulating all issues related to nuclear, radiation, transport and waste safety, in particular nuclear safety, radiation protection, nuclear security, nuclear material safeguards, safety of radioactive waste and spent fuel management and radiation emergency preparedness. The Atomic Law Act constitutes the President of the PAA as the central authority of the governmental administration acting as the nuclear regulatory body in Poland. The President executes his tasks through the National Atomic Energy Agency.

The last significant amendment to the Atomic Law Act was the Act of 13 June 2019 amending the Atomic Law and the Act of Fire Protection. The Act is intended to ensure the highest achievable level of nuclear safety and radiological protection in Poland in accordance with the IAEA and European standards.

Since the amendment of 2019 there have been no significant changes to the Atomic Law Act regarding the safety of spent fuel and radioactive waste management.

The Atomic Law Act is supported by series of detailed regulations issued by the Council of Ministers listed in the Annex VI.

System of licensing

The Atomic Law Act requires that activities involving real and potential exposures to ionizing radiation from artificial radioactive sources, nuclear materials, equipment generating ionizing radiation, radioactive waste and spent nuclear fuel shall be supervised and controlled by the State and shall be authorised after the measures specified in the appropriate regulations have been taken in order ensure and protect human life and health, as well as property and the environment (art. 2). This includes the obligation of obtaining an appropriate license, excluding the cases when such activities may be performed on the basis of notification, registration or do not require a license or notification according to the criteria established in the Regulation of the Council of Ministers of 10 March 2021, based on the art. 6.1 of the Atomic Law.

The Atomic Law Act stipulates that a license from the competent nuclear safety and radiation protection authority is required to carry out activities involving ionizing exposure[3] . The activities listed include

1. manufacturing, processing, storage, transport or use of nuclear materials, radioactive materials or radioactive sources, excluding processing, storage, transport or use of waste containing radioactive substances other than radioactive waste,
2. construction, commissioning, operation or decommissioning of nuclear facilities,
3. construction, operation or closure of radioactive waste repositories,
4. trade in the materials or sources referred to in point 1, excluding trade in substances containing radioactive substances other than radioactive waste,
5. storage, transport, processing or disposal of radioactive waste,
6. storage, transport or reprocessing of spent nuclear fuel or trade in such fuel,
7. isotopic enrichment,
8. operation or closure of uranium ore mine,
9. manufacture, installation, use and/or maintenance of equipment containing radioactive sources and trade in such devices,
10. commissioning and/or use of equipment generating ionising radiation;
11. commissioning of laboratories, in which ionising radiation sources may be used, in particular X-ray laboratories or medical X-ray laboratories,
12. intentional addition of radioactive substances in the processes of manufacturing of:

1) consumer products,

2) medical devices and medical device equipment within the meaning of Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC (OJ EU L 117, 05.05.2017, p. 1, as amended), as well as the products listed in Annex XVI to that Regulation, and in vitro diagnostic medical devices and in vitro diagnostic medical device equipment, as defined in Regulation (EU) 2017/746 of the European Parliament and of the Council of 5 April 2017 on in vitro diagnostic medical devices and repealing Directive 98/79/EC and Commission Decision 2010/227/EU (OJ EU L 117, 05.05.2017, p. 176, as amended),

13. trading in the products or equipment referred to in point 12,
14. import into and export from the territory of the Republic of Poland of the products or equipment referred to in point 12,
15. import into and export from the territory of the Republic of Poland consumer products to which radioactive substances have been added,
16. intended administration of radioactive substances to people or animals for the purpose of medical or veterinary diagnostics, therapy or scientific research,
17. activation of materials resulting in increase in activity in a consumer product, which at the time of placing on the market cannot be disregarded from a radiation protection point of view

[3] Chapter 2, Article 4.1 of the Atomic Law Act.

The President of the PAA issues the licenses and accepts the notifications and registrations relating to the activities/practices that are listed above. However, a license to perform exposure-related activities involving:

a) commissioning and/or use of X-ray devices in a medical X-ray laboratory and the commissioning of such laboratories,

b) commissioning and/or operation of X-ray devices for the purposes of radiodiagnostics or interventional radiology practices, superficial radiotherapy or non-oncological radiotherapy outside an X-ray laboratory are be issued by the state regional sanitary inspector.

In the case of above-mentioned license for health care units subject to:

a) the Minister of National Defence, or supervised or established by the Minister of National Defence – are issued by the commander of a military preventive medicine centre or the military sanitary inspector of a military preventive medicine centre, authorised by the commander of a military preventive medicine centre;

b) the minister competent in home affairs, or supervised or established by the minister competent in home affairs – are issued by the state sanitary inspector of the Ministry for Home Affairs and Administration

Performing exposure-related activities involving:

- extraction of crude petroleum and natural gas,
- extraction of metal ores, with the exception of uranium ores,
- use of thermal waters for electricity production,
- extraction or processing of phosphates, including production of phosphorus, phosphoric acid or phosphate fertilisers,
- groundwater treatment or filtration,
- production of crude iron from iron ore,
- extraction of rare earths from monazite,
- production of tin, lead or copper,
- production of zirconium or zircon,
- production of TiO_2 pigment,
- operation of coal-fired power plants, including maintenance of boilers,
- cement production, including maintenance of cement kilns,
- processing of niobium or tantalum ore,
- production of thorium compounds and manufacture of thorium-containing products,
- work in workplaces, in which, despite the action taken in accordance with the principle of optimisation, the indoor radon concentration inside these workplaces exceeds the reference level referred to in Article 23b,
- work in underground workplaces, in which, despite the action taken in accordance with the principle of optimisation, the level of potential alpha energy concentration of short-lived decay products of radon in those workplaces indicated the possibility of a worker being exposed to an effective dose exceeding 1 mSv (millisievert) a year

- is subject to notification in respect of radiation protection.

Notification on carrying out activity involving exposure:

- referred to in points 1, 2 and 16,
- consisting in work in workplaces referred to in point 15, subject to supervision by mining supervisory authorities pursuant to the Act of 9 June 2011 – the Geological and Mining Law (OJ of 2017, Item 2126, as amended))

- shall be accepted by the director of a district mining office.

Notifications on carrying out activity involving exposure:

- referred to in points 3 - 14,
- consisting in work in workplaces referred to in point 15, not subject to supervision by mining supervisory authorities

- shall be accepted by the state regional sanitary inspector.

The license may be granted after verification that all safety requirements laid down in the Atomic law and its supporting regulations are met and that a facility is deemed to be safe, satisfying regulatory acceptance criteria. In carrying out the review, assessment and verification tasks, the PAA may make use of external consultant organizations and experts. The requirements, concerning the documentation to be submitted by an applicant and the procedure to be followed in order to obtain an appropriate license, have been established by the Council of Ministers Regulation on the documents required with the application for the license for activities involving the exposure to ionizing radiation or with the notification of such activities. It refers to the part dedicated to radioactive waste and spent nuclear fuel facilities.

Before being issued by the President of the PAA, draft licenses related to nuclear facilities are reviewed by the Council for Nuclear Safety and Radiation Protection (CNSRP) which is consultative and advisory body to the President of the PAA. CNSRP was established by Atomic law amendment of 2011. The Council consists of chairman, deputy chairman, secretary and not more than 7 members - experts in nuclear safety, radiation protection, physical protection, nuclear material safeguards, geology etc. The Council is elected for a term of 4 years.

Prohibition of the operation without a licence

According to the art. 2 of the Atomic Law Act, activities involving real and potential exposures to ionizing radiation emitted by radioactive waste and spent nuclear fuel are permitted after undertaking the measures specified in relevant regulations have been taken to ensure the safety and protection of human life and health, as well as the protection of property and the environment.

According to the art. 4 of the Atomic Law activities involving ionizing radiation require licenses, which is issued by the President of the PAA after ascertaining that the conditions and requirements relevant to radiation and nuclear safety have been met and fulfilled at the given stage. This means in particular that the operation of a facility without a license is prohibited. At each of the stage the applicant/licensee must submit to the President of the PAA, together with his application for a license, a proper safety documentation of the facility. The results of the review and assessment of this documentation provide the basis for the regulatory body to prepare an appropriate license and to specify the relevant requirements and conditions in the text of license document.

The import into, export from and transit through the territory of Poland of radioactive waste and spent nuclear fuel shall require (art. 62 Section 1) the license, registration or notification of the President of the PAA.

The head of the organizational entity, who without the required license, or in violation of the conditions attached to such a license, engages in the construction, operation, closure and decommissioning of radioactive waste and spent nuclear fuel repositories, or in the construction and operation of storage facilities for spent nuclear fuel, or in the import, export or transit of radioactive waste and spent nuclear fuel, shall be subject to a fine (art.123), imposed by the President of the PAA.

The Polish Penal Code provides that anyone who possesses, uses, produces, reprocesses, collects or trades in radioactive materials or ionising sources without permission or violation of the conditions laid down is liable to imprisonment for a period of six months to eight years. Anyone who pollutes water, air or ground soil with a substance or contaminates it with ionising radiation in such quantity or form that it is likely to endanger human life or health or cause a significant deterioration in the quality of water, air or land surface or significant destruction in the plant or animal world shall be liable to imprisonment for a period of 3 months to 5 years. Whoever, in violation of the provisions of the law, manufactures, processes, transports, imports, exports, accumulates, disposes, stores, owns, uses, removes, discards or leaves without proper protection of nuclear material or any other source of ionizing radiation under such conditions or in such a way it may endanger human life or health or cause a significant deterioration in the quality of water, air or land surface or destruction in the plant or animal world on significant scale, shall be liable to imprisonment for a period of 3 months to 5 years.

Inspection and Enforcement

Activities related to exposure of humans and the environment to ionizing radiation are supervised and inspected by Nuclear Regulatory Bodies. The Nuclear Regulatory Bodies consist of:

1. the President of the PAA the supreme nuclear regulatory body,
2. Nuclear Regulatory Inspectors.

To become a nuclear regulatory inspector number of conditions have to be fulfilled. The candidate must hold MSc in physics, chemistry, engineering or other useful specialization, a medical certificate allowing employment in occupational exposure conditions and must first complete practical training with a successfully passed qualification examination organized by a commission appointed by the President of the PAA. Each candidate for nuclear regulatory inspector is trained according to tailored-made individual program approved by the President of the PAA on case-by-case basis.

The main areas of regulatory inspections carried out by PAA inspectors are: applications of ionizing radiation in medicine, science and industry, nuclear facilities and the National Radioactive Waste Repository as well as nuclear materials safeguards. Safeguards inspections are often carried out jointly with the IAEA or Euratom inspectors. Formally, inspections are divided into three types:

1. periodic inspections – in accordance with the inspection plan approved by the President of the PAA,
2. reactive inspections – whenever circumstances arise which may have a significant impact on the nuclear safety and radiological protection at a nuclear facility subject to inspection,
3. continuous inspections – at nuclear power plants on the basis of a permanent authorization.

During inspections inspectors shall be entitled to:

- unrestricted access to the sites, facilities and transport vehicles,
- unrestricted access to documents, logbooks and other data carriers,

- conduct independent technical and dosimetric measurements,
- request written or oral information from staff,
- collect samples for laboratory examination,
- record the course and results of inspection using audio-visual recording systems,
- request the assistance of experts, specialists and laboratories.

As a result of inspection findings different types of enforcement actions may be taken. If, during inspection, a direct threat to nuclear safety and radiological protection is discovered, the inspector is entitled to issue orders containing injunctions or prohibitions of certain activities (e.g.: to stop the operation of a nuclear facility, to cease to perform specific works or operations). In less serious situations, if conditions are found which may adversely affect nuclear safety and radiological protection, although no legal requirements or license conditions are violated, the inspector may make recommendations to improve the nuclear safety and radiological protection. Based on the inspection report the President of the PAA is entitled to issue a post-inspection statement/decision requesting appropriate corrective actions within a specified time period.

In addition, fines may be imposed for conducting activities without a license, violating legal requirements or license conditions, preventing or obstructing the conduct of regulatory inspections, or losing nuclear or radioactive materials.

The President of the PAA is also entitled to revoke the license if the licensee has ceased to fulfill the safety requirements, has not complied with the orders or decisions issued by the nuclear regulatory body or has not eliminated, within the period specified by the licensing body, the factual or legal status, which does not comply with the conditions specified in the license or with the legal provisions for the activities covered by the license.

Allocation of responsibilities

The legal responsibility for safety lies with the license holder. The organization holding a license cannot transfer the responsibility to another organization which does not hold a license valid for the facility or the activity. Before such a transfer can take place, a license must be obtained in accordance with rules agreed with the PAA. Furthermore responsibility for compliance with nuclear safety and radiological protection requirements rests with the head of the entity, who shall ensure that the activities are conducted in accordance with the principle of optimization, which requires that – after accounting in a reasonable way for economic and social factors - the number of exposed workers and members of the public shall be as low as reasonably achievable and the ionizing radiation doses received by them shall be as low as possible. An assessment of the exposure of workers shall be carried out and if the optimization analysis indicates the need to do so, further restrictions on their exposure shall be laid down in such way, that the ionizing radiation doses received do not exceed the established dose constraints.

The Radioactive Waste Management Plant is the only legal entity in Poland designated to carry out collection, treatment, conditioning, interim storage and – above all – the activities ensuring the permanent feasibility of radioactive waste and spent nuclear fuel disposal.

Responsibility for regulatory control of both – the individual users, and the ZUOP - rests with the President of the PAA, the legal authority to issue licenses and binding opinions, and to conduct inspections of activities that results in the generation of spent nuclear fuel and radioactive waste.

Deciding whether to regulate radioactive substance as radioactive waste

The Atomic Law Act defines radioactive substance as the material containing one or more radioactive isotopes, with the activity or radioactive concentration of which cannot be

disregarded from the point of view of radiological protection. Radioactive waste is defined as solid, liquid or gaseous material containing radioactive substance or contaminated with radioactive substance, further use of which is not foreseen or considered, and which is classified according to its radioactive concentration into a waste category and, if appropriate, to waste subcategory - according to the half-life and concentration of radioactive isotopes contained in the waste, and additionally according to the activity level in the case of liquid waste (art. 47.1-1c). DSRS also become a separate category of radioactive waste if such a decision is taken (art. 47.2). The head of the organizational entity on whose site the waste is generated classifies and registers it as waste of a specific category (and subcategory, if applicable).

Classification of radioactive waste may also be carried out by the President of the PAA, but only in the following cases:

- discrepancy between the classification of the waste carried out by the head of the organizational entity where the waste is generated and the classification carried out by the head of the organizational entity receiving the waste,
- irregularities in the classification of the waste are established by the head of the organizational entity where the waste is located,
- the classification of the waste is not carried out by the head of the organizational entity.

Spent nuclear fuel is also treated as high-level radioactive waste of if it is destined for disposal (art. 47.1c).

ARTICLE 20. REGULATORY BODY

Text of Article 20:

1. **Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfill its assigned responsibilities.**
2. **Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.**

Scope of responsibilities and organization

In accordance with the Atomic Law Act any activity involving exposure is subject to supervision and control within the scope of nuclear safety and radiation protection.

Supervision and control are conducted by:

1. nuclear regulatory authorities - if the authority competent to issue licenses or receive notifications is the President of the PAA;
2. the state regional sanitary inspector, Chief Sanitary Inspector, commander of military preventive medicine centre or the military sanitary inspector of the military preventive medicine centre authorised by that commander, Military Chief Sanitary Inspector or

the state sanitary inspector for the Ministry for Home Affairs and Administration – within the scope of:
   a) activity to which these authorities issue a license or grant a consent,
   b) activity of which they receive a notification,
   c) radiation protection of patient;
3. the Director of the Regional Mining Authority – within the scope of activity of which the Director is notified;
4. the President of the Civil Aviation Authority – within the scope of the obligations referred to in the Atomic Law Act regarding crew member protection.

According to definitions in the art. 64.1 of the Atomic Law Act, the authorities of the regulatory body consist of:

1. the President of the PAA, as the supreme nuclear regulatory authority,
2. regulatory inspectors.

The Atomic Law Act defines the task of the above mentioned regulatory authorities in its Chapter 9. They include in particular (art. 64.4):

1. issuing the licenses and other decisions in the issues related to the nuclear safety and radiological protection, according to the principles and methods established by the law,
2. conducting inspections in nuclear facilities and in organizational entities which hold nuclear materials, ionizing radiation sources, radioactive waste and spent nuclear fuel,
3. issuing on-the-spot orders containing interdictions or injunctions, if any threat to nuclear safety or radiological protection has been found during the inspection.

The President of the PAA constitutes the central authority of the governmental administration, competent in the issues of nuclear safety and radiological protection within the scope defined in the Act of Atomic Law (art. 109.1). Mandate, authority and particular responsibilities of the President of the PAA are defined in the Chapter 13 of the Atomic Law Act.

The President of the PAA is appointed for a five-year term of office, which guarantees his independence and may be reappointed only once. After the expiry of the term of office, PAA President performs his function until his successor is appointed. According to art. 109.2b of ALA, the President of the PAA may be dismissed by the Prime Minister before the end of the term of office for which he was appointed, only in the case of:

1. gross violation of the law,
2. a conviction by a final judgment for an intentional crime or a fiscal crime,
3. declaring a ban on holding managerial positions or performing functions related to special responsibility in state authorities,
4. disease that permanently prevents the performance of tasks,
5. resignation,
6. the Prime Minister's refusal to accept the PAA President annual report on its activities for the previous year.

The President of the PAA is administratively supervised by the minister competent for Climate matters. The President of the PAA is nominated by the Prime Minister on request of MoC (art. 109.2). In accordance with art. 113 of ALA MoC grants the Statute of PAA, specifying its internal organization. In the past practice, the minister supervising the President of the PAA always granted the Statute of PAA at the request of the President of the PAA and in accordance with this request. Detailed organization and operation of PAA

and the scope of tasks of its organizational units are specified in the organizational regulations issued by the President of the PAA by virtue of an ordinance (see Fig. 5).

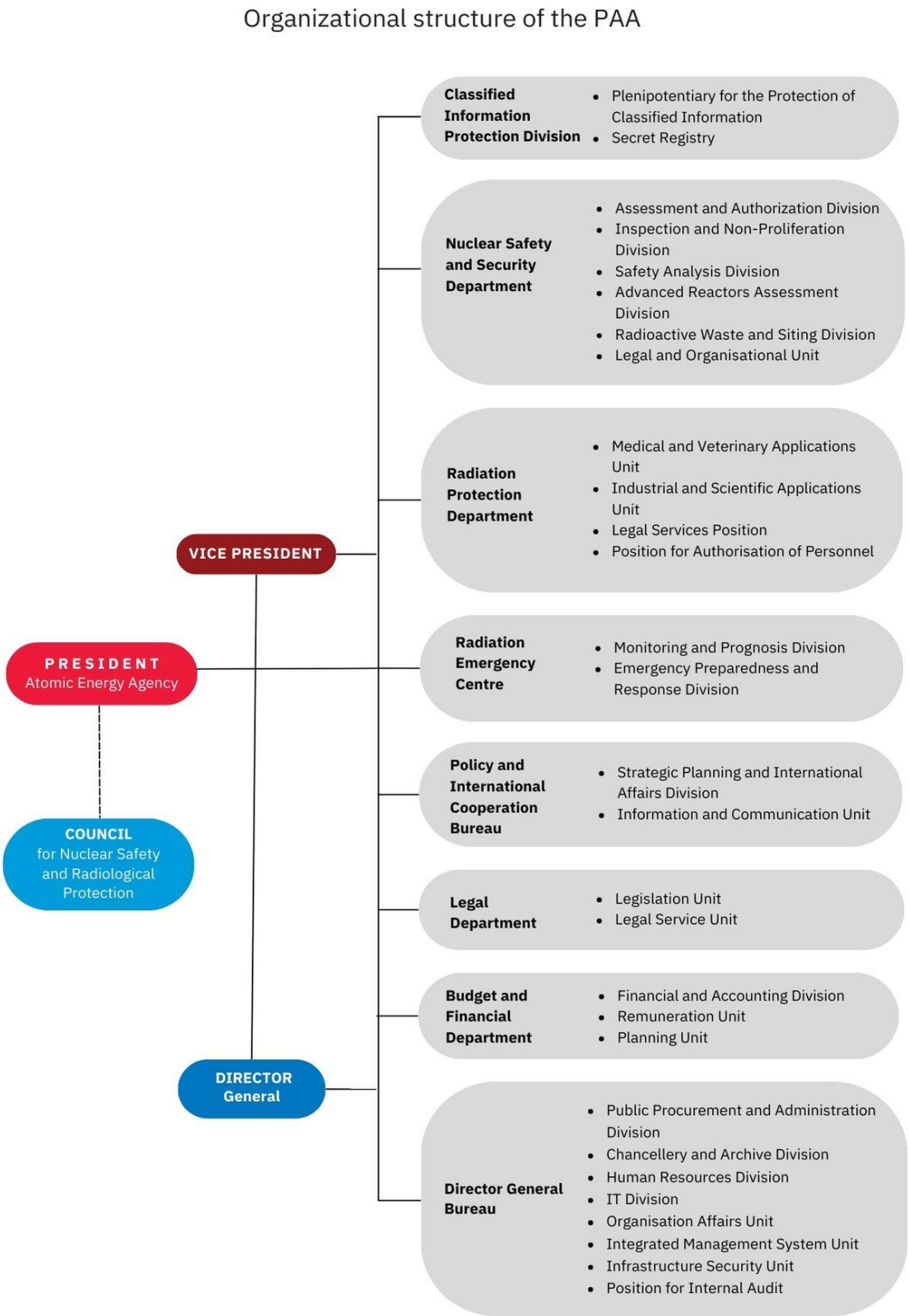

Fig. 5. Organizational structure of the PAA.

The President of the PAA in the discharge of its regulatory responsibilities perform his or her duties related to particular regulatory tasks listed above as well as to the following ones:

1. developing the drafts of legal acts(art. 110 p.11) and guidelines (art. 110 p.3) for nuclear safety and radiation protection,
2. giving binding opinion at the stage of siting and licensing the construction, commissioning, operation, decommissioning and closure of nuclear facility and radioactive waste repositories respectively, after appropriate review and assessment of all safety concerns (art. 4, art. 36-38, Chapter 7),
3. licensing activities related to the application of radiation sources (art. 5, art. 64.4 p.1),
4. conducting review and assessment of the licensees' documentation, demonstrating the safety of nuclear installations or other radiation sources application (art. 66.1 p.2),
5. verifying whether the activities/practices performed by licensees comply with the nuclear safety and radiation protection requirements as set forth in relevant regulations and terms of licenses (art. 66.1 p.3).

The licenses and other decisions related to safety of nuclear installations and radioactive waste and spent fuel management facilities are issued by the President of the PAA, on the basis of documents prepared by a facility operator and opinion on these documents by the Nuclear Safety and Security Department in cooperation with Legal Department. Inspectors from Nuclear Safety and Security Department perform regulatory inspections in nuclear facilities and facilities for the management of radioactive waste and spent nuclear fuel in Poland, and also perform assessments of the situation concerning nuclear and radiation safety in nuclear facilities in neighbouring countries.

Licenses for activities/practices involving ionizing radiation sources that are within the scope of the PAA President (or individuals authorized by the President) are based on the opinion prepared by the Department of Radiological Protection (in cooperation with Legal Department) after review and assessment process. The inspectors from the Department of Radiological Protection perform all other relevant inspections.

Human resources

After the governmental decision in 2009 to embark on nuclear power, PAA started the self-assessment process, which included an identification of the PAA needs in the Polish Nuclear Power Program. As a result of this process, a document entitled "Guidelines for programme of necessary actions to be taken in the National Atomic Energy Agency" was prepared. The needs for recruitment and training of the staff were identified, so that PAA could meet the requirements of a nuclear regulatory body posed by the Polish Nuclear Power Program. In June 2011, the document entitled "A few notes on the tasks, organization, development and financial issues of the National Atomic Energy Agency (Nuclear Regulatory Body) in the perspective of the construction of a nuclear power plant in Poland" summed up the results of analyses performed with regard to necessary organizational changes and development of the staff. These analyses took into account expected new tasks of the regulatory body relating to the safety assessment of documentation submitted by an applicant/licensee to obtain the PAA President's opinion and license at different stages of the lifetime of a nuclear power plant. On the basis of this analysis the plans and costs of the staff development were identified till the end of 2014. According to those estimates the number of jobs in PAA should be increased by 39 new positions. The founds for hiring 39 employees were provided by the government. In January 2015 process of employment for those 39 positions was finished successfully and since then the biggest challenge for the PAA was to maintain these personnel, which had gained a lot of experience both during work and training. In 2017 PAA two documents were prepared in PAA:

1. “Plan for employee hiring and development of human resources for the years 2017-2019”. This plan covers 3 main areas: forecast of demand for employees (internally and overall employment situation in the fields related to PAA’s scope of work), supply and demand in PAA, implementation of the optimization of the human resources.

2. Human Resources Development (HRD) Program for the years 2017 - 2019. It includes a report on human resource management (structure of employment, qualifications, annual changes in number of personnel in previous 4 years), sets priorities, describes areas of human resources management and sets annual objectives for the period of 3 years in identified areas. Identified areas of human resources include: human resources management organization, recruitment and introduction to work, motivating, development and training and termination of employment.

The strengthening of the regulatory body was one of the main tasks to be performed under the PNPP. In April 2023 the document “Programme for professional development of employees of the National Atomic Energy Agency for the Polish Nuclear Energy Program was adopted, where the issue of building technical competence is addressed in detail. By the end of 2033, the PAA should have 110 staff members strictly devoted to tasks related to Polish Nuclear Power Program. By the end of 2023, PAA had employed 67 employees out of the planned 110 by the end of 2033. Very importantly, reinforcing the workforce of the PAA is necessary already at the very preliminary stage of PNPP implementation. The vast majority of the needed staff, about 75%, should be hired and trained before the PAA receives the application for a license to construct the first nuclear power plant, i.e. in 2022-2023. Thereafter, the personnel is to be steadily increased until 2033, taking into account the oversight of nuclear regulatory inspectors for the construction and commissioning of the first nuclear power plant and the licensing of subsequent nuclear units. The 2022-2024 workforce expansion plan includes 60 new positions, including: 2022 r. - 35 positions, 2023. - 20 positions, 2024. - 5 positions.

As of 2024, the recruitment plan is in progress, ten new employees have been hired in Nuclear Safety and Security Department strictly with the funds provided by PNPP. PAA faces some challenges, both in recruitment, due to reasons such as scarcity of human resources available on the market together with a strict civil service recruitment process, and in retaining staff, mainly due to the higher salaries being offered by external organizations.

Separation of regulatory and promotional function

Independence of the regulatory body is guaranteed by clear separation of promotional and regulatory functions:

1. matters related to social and economic use of nuclear energy are within the scope of activities of minister competent for the management of energy resources matters (pursuant to the Act on Governmental Administration Departments),
2. nuclear safety and radiological protection matters are within the scope of activities of the President of the PAA (pursuant to ALA).

All the operators of nuclear facilities, spent fuel and waste management facilities, as well as all organisational entities performing activities licensed by or notified to the President of the PAA are within the organisational structures other than PAA: the National Centre for Nuclear Research and Radioactive Waste Management Plant are supervised by the minister competent for management of energy resources.

In accordance with art. 109 of ALA, the minister competent for Climate matters supervises the President of the PAA. The President of the PAA is appointed by the Prime Minister from among persons selected through an open and competitive recruitment, at the

request of the MoC. The Prime Minister may dismiss the President of the PAA only in the above-mentioned cases specified in art. 109.2b of ALA. The minister competent for Climate matters, at the request of the President of the PAA, appoints PAA vice-presidents from among people selected through an open and competitive recruitment.

MoC does not have any influence on rulings and decisions made by the President of the PAA in nuclear safety and radiological protection matters.

Amendment of the Atomic Law of 2011 introduced requirement that the President of the PAA cannot promote the use of ionizing radiation, and in particular, of nuclear power sector.

Pursuant to the Polish administrative procedure, it is not possible to appeal to another administrative body against the regulatory decision issued in the first instance by the President of the PAA, who pursuant to art. 5 § 2.4 of the Code of Administrative Procedure (KPA) is treated as a minister. A party dissatisfied with the decision may apply to the President of the PAA for reconsideration of the case (art. 127 § 3 of KPA). Decisions issued by nuclear regulatory inspectors as part of their proceedings may be appealed against to the President of the PAA as the supreme nuclear regulatory body (art. 64.7 of ALA).

As a consequence, the party is entitled to an application for reconsideration of the case to the President of the PAA or a complaint to the voivodship administrative court against decisions issued in the first instance by the President of the PAA, and then a cassation appeal to the Supreme Administrative Court against the judgment of the voivodeship administrative court (art. 173 § 1 of the Act – Law on Proceedings Before Administrative Courts).

The activities of public administration are controlled by administrative courts for compliance with the law. When exercising control over the activities of public administration, administrative courts evaluate, as a result of an appeal, the activity (action or omission) of a public administration body. Therefore, they do not replace public administration bodies and do not take over their competences to settle the matter and issue a final decision. Judgments of administrative courts, if the complaints are upheld, decide on the revocation or annulment of the challenged act or oblige the public administration body to behave in a specific manner in the course of further handling of the administrative case.

As a consequence, no state authority, apart from the administrative courts which review the legality of decisions, is entitled to review the decisions of the President of the PAA. However the IRRS mission in 2023 has identified that the PAA is supervised by the Minister of Climate and Environment who is also the leading authority for peaceful use of nuclear and therefore “the Government should review the governmental and legal framework to ensure that the President of the PAA is effectively independent in safety related decision making and has functional separation from entities having responsibilities or interests that could unduly influence decision making”.

Transparency in Regulatory activities and communication with the public

The basis for access to public information held by PAA is given by art. 61 Sections 1-2 of the Constitution of the Republic of Poland. According to these regulation any citizen has the right to obtain information on the activities of organs of public authority as well as persons discharging public functions. This right to access to public information is implemented by the Act on Access to Public Information, that regulates scope and procedures for granting access to public information by state authorities.

According to Public Information Act, any information about public affairs is the public information within the meaning of the Act and is subject to availability. The public information is defined as “any information about public affairs”. The person performing the right to public information do not require demonstrating legal interest or actual.

Public information can be made available by publishing it on-line (in Bulletin of public information) or can be access by request, within 14 days from receiving request.

Moreover, the Atomic Law Act gives specific obligations to PAA in terms of access of the public to information on nuclear safety and radiological protection matters connected with spent nuclear fuel and radioactive waste management.

According to art. 110 of the Atomic Law Act, PAA is obliged, generally, to conduct activities concerning public communication and technical and legal information regarding nuclear safety and radiation protection. The Atomic Law Act specifically forbids PAA promoting any use of ionizing radiation with the emphasis on nuclear power sector.

In case of spent nuclear fuel storage facilities, which are considered a nuclear facility by the Polish law, PAA is obliged to publish, pursuant to the regulations on access to information on the environment and its protection, the participation of general public in environmental protection and on environmental impact assessments, information on:

1. information on the status of nuclear safety and radiological protection of nuclear facilities, and their impact on the human health and natural environment,
2. information on volume and isotopic composition of radioactive substance emissions from the nuclear facilities to the environment,
3. information on any hazardous emergencies at the nuclear facility,
4. licenses issued for the nuclear facilities,
5. annual safety assessments of the inspected nuclear facilities.

In case of radioactive waste repository, PAA is obliged to publish, pursuant to the regulations on access to information on the environment and its protection, the participation of general public in environmental protection and on environmental impact assessments, information on:

- information on the status of radiological protection of a radioactive waste management plant, and their impact on the human health and natural environment,
- information on volume and isotopic composition of radioactive substance emissions from a radioactive waste management plant,
- information on any hazardous emergencies at the nuclear facility,
- licenses issued for the nuclear facilities,

Moreover, PAA also publishes:

1. annual safety assessments of the inspected nuclear facilities,
2. inspection programmes,
3. summary orders containing injunctions or interdictions addressing specified activities and post-inspection decision requesting appropriate corrective actions within a specified deadline issued in case of the threat to nuclear safety and radiological protection within the facility.

These information are published in Bulletin of public information of PAA.

In addition, the President of the PAA presents to the Prime Minister annual reports on his activities and assessments of the state of safety and radiological protection of the country. This obligation is fulfilled by the publication of the Annual Report of the PAA President. The Annual Reports of the PAA President are available to everyone on the PAA website.

Licensing process of a nuclear installation or radioactive waste repository in Poland ensures several opportunities for the public to participate in the decision-making process relating to licensing of nuclear installations.

According to the Act on the Provision of Information on the Environment and its Protection, Public Participation in Environmental Protection and Environmental Impact Assessments, decisions on granting construction license for nuclear installations has to be preceded by environmental permit issued on the basis of environmental impact assessment.

The process of issuing the environmental permit, performed by regional director for environmental protection, provides scopes of means for public participation in the process. The process grants opportunity to submit comments and claims for every member of the public. Comments and claims can be submitted in writing, orally and by means of electronic communication without the obligation to insert a safe e-signature.

Furthermore, the law grants additional aims of participation to environmental organisations, such as NGOs, that can take part in the process upon the rights of a party.

After the environmental permit is issued, the opportunity to participate in the licensing process are granted to the public on the stage of issuing a construction license for nuclear installation by PAA by the Atomic Law Act. Having received an application for a license to conduct activities involving exposure and consisting in the construction of a nuclear facility or operating radioactive waste management plant, the President of the PAA shall immediately publish the application with an abbreviated Safety Analysis Report in the Public Information Bulletin, in the section dedicated, along with:

- information on the initiation of proceedings in response to the application for a license to build a nuclear facility,
- information on the right to make submissions or observations,
- information on how and where to make submissions or observations within 21-day deadline,
- information on how and where the administrative proceedings take place.

These information has to be published by PAA in press available in the municipality within whose boundaries the site referred to in the application is located, and in the neighbouring municipalities and on PAA Public Information Bulletin website.

Comments and claims can be submitted to PAA in writing, orally and by means of electronic communication without the obligation to insert a safe e-signature. Any interested party will be able to submit comments, questions or applications to the President of the PAA. The President of the PAA, in the justification of the decision to issue a permit, will have to inform how the comments or requests have been taken into account.

With the aim of making the nuclear licensing process as transparent as possible, the PAA's plans include active communication with the public, both through social media and in the form of meetings with interested parties.

Restrictions towards accessibility of information to the public are included in both Act on Access to Public Information and Atomic Law Act. The regulations and the proper arrangements, including procedures, are in place to ensure appropriate protection of sensitive information such as:

- information on physical protection,
- information on nuclear material safeguards,
- state secrets,
- commercial and trade secrets.

Those information are not to be disclosed to the public. Every member of PAA staff responsible for providing information of the public is trained in the scope of restrictions to the availability of information to the public and the proper assessment by legal and technical experts is undertaken in case of possibility of disclosure of sensitive information.

The scope of activities of the President of the PAA includes the tasks that involve public information, education and popularization, scientific and technical and legal information in the field of nuclear safety and radiological protection, including informing the public about ionizing radiation and its impact on human health and on the environment and about possible measures to be applied in case of radiation emergency. PAA performs the aforementioned tasks by:

- publishing relevant information on its website (in Polish and English),
- providing information to the media representatives and interested citizens via newsletter,
- maintaining an updated map showing gamma radiation dose rate on Poland's territory (available on PAA's website),
- providing information via X (formerly Twitter), YouTube and LinkedIn account by PAA's spokesperson,
- organizing press conferences and maintaining day-to-day contact with the media (press releases),
- publishing a quarterly entitled "Nuclear Safety and Radiological Protection",
- publishing quarterly communications to the general public about national radiation situation, as well as radioactive contamination levels in normal conditions and in emergency,
- preparation of annual reports on the activities of the Agency's President (in Polish and English),
- a new, detailed communication strategy for the PAA was adopted – in 2023. The communication strategy details the key messages of the PAA and the means to reach the target audiences, including communication channels and opportunities for targeted interaction,
- to improve social communication skills and meet the expectations of the media and society, PAA staff are trained in crisis communication, contacts with journalists and public appearances,

In 2023, the Integrated Regulatory Review Service Mission (IRRS) commended the PAA for the extensive, relevant and timely crisis communication on radiation and nuclear emergencies in relation to the war in Ukraine, among others through the PAA website, especially for:

- increased frequency of messages on the radiation situation in the country (X - Twitter) - what counts is a quick response in emergency situations,
- current messages on the website and in social media - explaining aspects related to nuclear safety,
- conferences with the participation of the Minister of Climate and Environment and Minister of the Interior and Administration,
- press, television, radio interviews
- answers to journalistic questions,
- contacts with citizens (via email, telephone).

Moreover, in order to ensure transparent decision-making process, PAA conducts public consultation process of preparing and issuing technical and organizational recommendations concerning nuclear safety and radiological protection of certain activities. This involved consultations of PAA President's recommendations on:

- security of radioactive sources – in 2017,
- acceptance criteria for radioactive waste to be disposed in surface radioactive waste management plant – in 2019,
- storage of radioactive waste - 2023.

The PAA website is fully accessible for people with disabilities according to accessibility standard in line with WCAG 2.1. (Web Content Accessibility Guidelines).

SECTION F. OTHER GENERAL SAFETY PROVISIONS

This section covers the obligations under the articles from 21 to 26.

ARTICLE 21. RESPONSIBILITY OF THE LICENCE HOLDER

Text of Article 21:

1. **Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.**
2. **If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.**

According to art. 7.1 of the Atomic Law Act the responsibility for compliance with nuclear safety and radiological protection requirements rests with the head of the organisational entity pursuing the activities involving exposure. These activities, as defined in the art. 4.1 of the Act, include in particular the construction, commissioning, operation and decommissioning of storage facilities for spent nuclear fuel as well as the construction, operation and closure of radioactive waste and spent nuclear fuel repositories, and require license granted by the President of the PAA. Also the import, export or transit of radioactive waste and spent nuclear fuel requires consent from this Body.

According to art. 48a of the Atomic Law Act the responsibility for ensuring the possibility of management of radioactive waste and spent nuclear fuel, including financing, rests with the organizational entity, which produced the radioactive waste or spent nuclear fuel. Head of the organizational entity conducting of activity consisting of radioactive waste or spent nuclear fuel management is responsible for the safety management of radioactive waste or spent nuclear fuel, in particular for ensuring radiation protection and, where applicable, security and safeguards.

To ensure that each license holder meets its responsibility, the obligation of submitting of relevant quarterly reports is usually imposed on him by the license conditions and regulatory inspection are performed for verification. In 2012 came into force the Regulation of the Council of Ministers on periodic safety review (PSR) of nuclear facility which provide a detailed scope of PSR of nuclear facility and a scope of periodical assessment report. The Regulation of the Council of Ministers on PSR of radioactive waste disposal came into force in 2016.

ARTICLE 22. HUMAN AND FINANCIAL RESOURCES

Text of Article 22:

Each Contracting Party shall take the appropriate steps to ensure that:

- **i. qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;**
- **ii. adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;**

iii. financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility.

Human Resources

According to art. 12 of the Atomic Law Act and the supporting Regulation of the Council of Ministers of March 5, 2021, item 640, concerning radiological protection inspectors, as well as the Regulation of the Council of Ministers of March 5, 2021, item 765, concerning positions important for nuclear safety and radiological protection, in ZUOP and NCBJ there are following specializations, important for ensuring nuclear safety and radiological protection, which may be occupied by individuals possessing appropriate authorizations issued by the President of the PAA:

1. ZUOP
   - specialist of nuclear material accountancy,
   - radiation protection officers,
   - operator of spent nuclear fuel storage facility,
   - head of radioactive waste repository,
   - head of radioactive waste management plant.

2. NCBJ
   - Deputy Director for Nuclear Safety and Radiological Protection,
   - radiation protection officer,
   - specialist for the accountancy of nuclear materials,
   - research reactor operators,
   - research reactor shift supervisors,
   - research reactor health physicist,
   - research reactor manager.

Financial resources

Art. 48a of the Atomic Law Act mandates that the organizational entity responsible for generating radioactive waste or spent nuclear fuel must ensure the capability to manage such materials, including financing the process from their creation until its delivery to disposal.

ZUOP`s financial resources, dedicated to supporting the safety of the facilities for managing spent nuclear fuel and radioactive waste, includes management:

- funding from the state budget via the **MoE,**
- revenue from ZUOP's service activity,
- special provisions from the state budget for unforeseen waste, such as orphan sources.

The available financial resources are deemed sufficient to cover the routine operation of ZUOP.

The National Plan of Management of Radioactive Waste and Spent Nuclear Fuel outlines financial resources allocated to support the safe closure of the repository. Funding for this purpose will be drawn from the Multiannual Plan for the closure of the repository in Różan and the construction of a new radioactive waste repository. The Multiannual Plan will be established by the Council of Ministers, based on proposals from the **MoE.** Financial support for these objectives should be accessible from the state budget when decommissioning of facilities or closure of the repository is initiated.

In accordance with the Atomic Law Act, the license to operate a nuclear facility, which is the MARIA reactor, may be issued to an organizational entity that meets the requirements

of nuclear safety, radiological protection, physical protection and nuclear material safeguards and has the financial resources necessary to ensure nuclear safety, radiological protection, physical protection and safeguards of nuclear materials at various stages of the operation of a nuclear facility, until its decommissioning. The Atomic Law includes the provision to account sufficient financial resources to hold an license for operating nuclear facility (art. 38g). NCBJ submitted during application for new license in 2015 documents confirming that NCBJ has sufficient financial resources. Currently NCBJ is preparing a license application for a new license. All required documents will be submitted this year.

ARTICLE 23. QUALITY ASSURANCE

Text of Article 23:

Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

The PAA pays special attention to the fulfilment of the QA-related requirements. According to art. 7 of the Atomic Law Act, the applicant/licensee is required to establish and effectively implement of the QA programme. Since the amendment of Atomic Law Act from 11th April 2008 notion “quality assurance programme” was formally introduced. Definition established by art. 3. p.32 is following: “system of actions, which ensures the fulfilment of specified requirements for nuclear safety, radiological protection and emergency response action, depending on conducted activity, and in case of activities involving nuclear materials or nuclear facilities – also the requirements for physical protection”. The QA programme should describe the ways of assuring that all quality-related activities will be performed in the properly controlled conditions, i.e. by properly qualified personnel using appropriate tools, equipment, methods and technological processes and under suitable environmental conditions, so that the required quality is attained and may be verified by inspection or test.

In case of nuclear facilities or radioactive waste repositories, entities operate these facilities have to implement Integrated Management System (Atomic Law Act art. 36k and art. 55f, respectively). QA programme which according to the Atomic Law Act is part of the Integrated Management System is reviewed by the regulatory body at all stages of the licensing process, i.e. prior to and during the construction, operation and closure of radioactive waste repositories, and construction, commissioning, operation and decommissioning of nuclear installations. If necessary, suitable conditions and requirements will be included in the license.

The regulatory body, through the requirements concerning the preparation and implementation of the Integrated Management System, obliges the applicant/licensee, as well as his vendors, to plan, perform, verify and document all their activities in an organized and systematic way. An effective IMS, established and implemented by the licensee, allows the regulatory body to obtain satisfactory confidence in the quality of facility’s equipment and in the quality of all performed activities. The regulatory body satisfies itself that the licensee has established and implemented and effective IMS by audits, document reviews and inspections of work.

In practice ZUOP`s Integrated Management System was implemented in 2015. Documentation describing the System was approved by the PAA. Functioning of the System is periodically controlled and assessed both by PAA and **MoE.** In 2024, the IMS was updated, introducing, among other things, the PDCA cycle and expanding the requirement for continuous updates and conducting audits.

NCBJ`s Integrated Management System was implemented in 2015. Documentation describing IMS was approved by PAA. The functioning of the System is periodically controlled and assessed by both the PAA and the top management of NCBJ. One of the

main part of NCBJ Integrated Management System is the Quality Assurance Program for the MARIA Reactor Facility. It is a document of the quality assurance system which includes elements related to safety, health, environment, quality assurance, economic issues and physical protection, giving priority to nuclear safety by ensuring, that all decisions are made after analyzing their impact on nuclear safety, radiological protection, physical protection and safeguards of nuclear materials, in accordance with art. 3 of the Atomic Law act. The Quality Assurance Program for the MARIA Reactor covers all issues related to the operation and maintenance of the MARIA reactor, including elements related to the storage of spent fuel elements from the MARIA reactor, and elements related to ensuring the safe storage of radioactive waste and its transfer to ZUOP. In 2019, the Integrated Management System was updated and the next update is planned for 2024 before obtaining the extension of the license for the operation of the MARIA reactor. One of the important implemented elements are the new procedures of the Radiation Emergency Management System and the preparation of an Emergency Procedure Plan in accordance with the amended law.
In accordance with the Integrated Management System and the Quality Assurance Program, both in the MARIA reactor and in the entire institute, audits are carried out to verify compliance of conduct and promotion of nuclear safety in relation to the principles contained in the Integrated Management System.

The scope of management of spent fuel elements from the MARIA reactor includes, inter alia:

- spent fuel element operations, including monitoring and containment,
- storage of spent fuel elements in the reactor technological pool, including records of spent fuel elements,
- monitoring the condition of spent fuel elements, including maintaining the proper chemical composition of water in the reactor pools in order to minimize the corrosion rate of the clad of the spent fuel elements,
- radiation protection during work with spent fuel elements.

The scope of management of radioactive waste from the MARIA reactor includes the following activities:

- operations related to the initial segregation of waste,
- operations related to storage, accounting, determination of mass, isotope composition and activity of individual isotopes as at the date of transfer to the ZUOP,
- waste packaging operations, packaging surface control,
- the operation of transferring the secured waste to the ZUOP along with the record cards for individual packages,
- operations related to the collection of waste in tanks, including monitoring of the filling level of tanks, measurements of the pH reaction, isotope composition and activity of individual isotopes as at the date of transfer to the ZUOP,
- pumping of waste through a pipeline to the ZUOP storage tank.

The description of procedural activities includes the preparation of the following documents:

- Radioactive Waste Records,
- Protocols for delivery and reception of waste transferred to the ZUOP.

ARTICLE 24. OPERATIONAL RADIATION PROTECTION

Text of Article 24:

1. Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:

i. **the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;**
ii. **no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and**
iii. **measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.**

Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

i. **to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and**
ii. **so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.**

3. **Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects.**

There are 68 workers in ZUOP. 42 of them are classified into category A and 24 classified into category B (June 2024). Occupational exposure assessment is based on either control measurements of individual doses or dosimetric measurements in the workplace. The radiation protection regulations mandated by law, particularly those governing the assignment of workers to categories A or B, as well as dose limits, are described in Annex VII.

Exposure assessment for category A workers involves systematic individual dose measurements. If these workers may also be exposed to radiation from internal contamination affecting their effective dose level, internal contamination measurements are also conducted.

Exposure assessment for category B workers is based on dosimetric measurements in the workplace, allowing for verification of their category assignment.

Regular radiation monitoring is conducted using TLD dosimeters. In the last 2 years (2022-2023) most of the individual dose equivalents recorded were below detection value (0,1 mSv per quarter). For category A workers average individual dose equivalent in 2022 was 0,17 mSv (maximum 1,06 mSv) and in 2023 average was 0,19 mSv (maximum 1,63 mSv). None of the workers exceeded the annual dose limit.

Environmental monitoring conducted both within and outside the ZUOP facilities in Otwock and the NRWR in Różan encompasses measurements of direct or stray radiation stemming from the operation of nuclear facilities (including reactors, accelerators, spent fuel and waste management facilities), as well as measurements of radioactivity in air, river and underground water, soil and vegetation samples. For a few last years the results of measurements indicate no discernible impact on the environment or the local population near the Świerk Centre and NRWR resulting from the operation of these facilities. For further

details regarding radiation protection regulations and dose limits in Poland, please refer to Annex VII.

At NCBJ, work in conditions of exposure to ionizing radiation is subject to the necessity to control the exposure of workers and the work environment and the environment around the MARIA reactor facility.

The control program is implemented through:

1. individual control of employees,
   - ongoing control of the work environment,
   - control of emissions of volatile and gaseous radioactive substances released through the reactor chimney,
   - radiological monitoring in and around Świerk.

The individual control program covers all personnel of the MARIA reactor. This program is implemented by monitoring external exposure (including: individual dose equivalent Hp(10) from the γ radius, individual dose equivalent Hp(0.07) from the β radius, environmental measurement of the dose equivalent from neutron radiation, measurement of personal contamination from α, β and γ rays, measurement of the individual dose equivalent of Hp(10) to γ rays) and by monitoring internal exposure (including: activity measurement, measurement of radioactivity of human secretions - "in vitro" (measurements of urine radioactivity)).

Environmental control in the MARIA reactor facility is carried out continuously using the equipment of a stationary dosimetry system by:

- measurement of gamma and neutron radiation fields related to the technological systems of the reactor and in rooms important for the operation of the reactor,
- air pollution control in the reactor facility buildings,
- Fuel Leak Detection System (WNEP).

The program for controlling emissions of volatile and gaseous radioactive substances to the environment is implemented in the MARIA reactor by controlling the emissions of volatile and gaseous radioactive substances released from the reactor chimney, including noble gases in air and iodine radioisotopes in air.

A radiological monitoring program for the area and surroundings of the Świerk based on measurements of air, water, sewage, soil, cereals, grasses, silt and total precipitation.

ARTICLE 25. EMERGENCY PREPAREDNESS

Text of Article 25:

1. **Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested at an appropriate frequency.**
2. **Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory insofar as it is likely to be affected in the event of a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.**

In accordance with the Atomic Law Act, radiation emergencies in Poland are classified basing on the range of the event, in the following way: on-site level, provincial level and national level. Then, entities responsible for emergency preparedness are respectively:

licensee, provincial governor, Minister of Internal Affairs with the assistance of the President of PAA. As arise from the law, during the emergency, previously enumerated executives are obligated to conduct actions aimed not only at eliminating the hazard itself but also mitigating risks and harmful consequences. Atomic Law defines also tasks needed to be fulfilled in advance, including preparing emergency plans and exercising them internally and in cooperation with other authorities.

Besides that, in each organizational unit must be available internal emergency workers, which are first to respond in the case of an emergency and allowed to exceed standard dose limits, since separate values for intervention measures are established. As soon as it is reasonable, external services may be engaged, including, as a last resort, dosimetry service of the President of the PAA. Currently, that role is fulfilled by the team operating under Central Laboratory of Radiological Protection, basing on the contract signed with the Radiation Emergency Centre of PAA. Recently, actions has been undertaken in order to form an independent team within PAA.

Therefore, both nuclear facility in Otwock and radioactive waste repository in Rozan has their own emergency plans which reflect on the emergency with spent nuclear fuel and radioactive wastes as well. The plans include internal (radiation protection and decontamination service) and external communication and cooperation (President of the PAA, Province Governor office and services, State Regional Sanitary Inspector, police, fire-department). These entities are also highlighted in provincial (Masovian) and national emergency plans.

Since the publication of the previous report, transitional period set in the new amendment to the Atomic Law elapsed, which means that established division to the hazard categories has come into a force. As an effect: category I means exposure-related activities likely to lead to a radiation emergency within an organisational entity resulting or likely to result in serious deterministic effects outside this entity, justifying the initiation of precautionary intervention measures, including evacuation, order to remain indoors, administration of stable iodine agents and other urgent intervention measures. Category I covers a nuclear reactor with a thermal power of more than 100 MW or a spent nuclear fuel storage facility in the amounts equivalent to a reactor core with a thermal power of 3000 MW. To Category II is classified exposure-related activities likely to lead to the occurrence of a radiation emergency within an organisational entity resulting, or likely to result, in stochastic effects of exposure of members of the public outside that entity justifying the initiation of urgent intervention measures. Category II includes a nuclear reactor with a thermal power above 2 MW up to 100 MW, a spent nuclear fuel storage facility requiring active cooling, an isotopic enrichment plant, a nuclear fuel fabrication plant or a spent nuclear fuel reprocessing plant and a radioactive waste repository. Hazard of Category III is exposure-related activities which may only lead to the occurrence of a radiation emergency which endangers the organisational entity justifying the initiation of urgent intervention measures on its site (e.g. nuclear reactor with a thermal power not exceeding 2 MW, uranium ore mine and activities with radioactive sources). To Category IV is classified exposure-related activities likely to lead to a radiation emergency justifying the initiation of urgent intervention measures at the site of the emergency (e.g. transport of radioactive sources, the use radioactive sources off the site). Category V is an exposure-related activities located outside the territory of the Republic of Poland which may lead to the occurrence of a radiation emergency due to the release of radioactive substances in such quantities as to necessitate the initiation of urgent intervention measures within the territory of the Republic of Poland. Category V includes nuclear reactors with a thermal power of more than 100 MW, located up to 300 km from the border of the Republic of Poland.

Moreover new regulation of the Council of Ministers has come into the force and currently describes the general scope of emergency response plans (as the reference to the art. 86g of the Atomic Law) for each level – on-site, provincial, national. It is given (except entities with hazard classification at the level III or IV) plan to be divided into three following

areas: tasks associated with preparation for response, tasks associated with responding and tasks associated with handling the existing exposure resulting from radiological emergencies. For each area, specific elements which need to be described are pointed out, taking under consideration unique requirements of each category and range. The plan is intended to contain elements such as: general practices involved to provide radiological safety, procedures of respond for accidents, establishing internal radiation dose limits and operational intervention limits, a blueprint of the facility with all objects substantive from the perspective of radiological safety marked, schedule of trainings and exercises. Emergency plans for facilities categorized at level III and IV has similar requirements, they are only slightly simplified and not divided into areas.

Effectively, Swierk and Rozan facilities, was also obligated to update their emergency plans in the accordance to the rules given in the amended Atomic Law. As they are classified in the category II, their plans had to be additionally consulted with the governor of a province, the Regional Fire Brigade Commander and the Regional Police Commander.

The art 86. of the Atomic Law, besides instructions to the emergency plans, regulates responsibilities in the field of: assessment of the potential hazards, arrangements of an evacuation process, rules of operation of internal emergency workers, system of sharing information, procedures of communication with the public authorities, like police or fire brigade.

According to present requirements (art. 96 of the Atomic Law Act) the frequency of exercising of the relevant plans at regional (provincial) and on-site level must be established within each particular plan by the province governor or the licensee respectively. Minimum frequency of exercises is once every 3 years at regional (provincial) level, once every year at facility level for entities belonging to hazard category I or II covering all scenarios described in the emergency plan (test including cooperation with external emergency teams at least once in 3 years) and once every 2 years for entities classified to hazard category III or IV. Minister of internal affairs is obliged by Law (art. 96. item 5 of Atomic Law) to perform exercise to test the national emergency plan at least once every 3 years.

Emergency response plans are also an element of the periodic safety assessment, which need to be held in nuclear facilities and radioactive waste repository (according to the art 37e and 55g of the Atomic Law Act respectively). Frequency of conducting an assessment is defined in the operating license (it must be at least 10 years for nuclear facilities and 15 years for radioactive waste repository). Report, as an outcome of the assessment, is presented to the President of the PAA. Detailed information about contents which need to be included both in the assessment process and in the report, are described in two regulation of the Council of Ministers (from 2012 for nuclear facilities and from 2015 for radioactive waste repository).

As there are no NPPs in Poland and other nuclear facilities are sited far from the national borders, it is rather unlikely that Poland could create immediate radiation hazard to a neighbouring country. Also the NPPs in neighbouring countries are not located in the close vicinity to borders of Poland. However, appropriate arrangements have been made to ensure the adequate response to even very unlikely radiation emergency situation. According to the Atomic Law the President of the PAA is responsible for performing tasks concerning the assessments of national radiation situation - both in normal conditions or in radiation emergency situations, immediate notifying appropriate authorities of relevant information and communicating the general public.

ARTICLE 26. DECOMMISSIONING

Text of Article 26:

Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

i. qualified staff and adequate financial resources are available;

ii. the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;

iii. the provisions of Article 25 with respect to emergency preparedness are applied; and

iv. records of information important to decommissioning are kept.

According to Atomic Law Act the decommissioning of a nuclear facility requires license from the PAA President. It is granted on the condition that applicant shall prove fulfilment of all the requirements set forth in the Atomic Law Act and secondary legislation related to the decommissioning (generic) as well as will be able to fulfil the conditions, related to particular facility to be decommissioned (facility specific), included in the license. It is foreseen that decommissioning of spent nuclear fuel and waste management facilities will be performed by the operator of these facilities. The art. 38b section 2 states, that the decommissioning plan, which is obligatory to submit along with other documentations and assessments in the licensing procedure, shall be revised and updated at least once every 5 years (according to art. 55j section 3 closure plan shall be revised and updated at least once every 15 years regarding radioactive waste repository), and in case of the early closure of the facility under circumstances unaccounted (which is understood as equal to reduced exploitation period), the plan shall be revised and updated immediately and submitted to the President of the PAA for an approval. It has to include the cost assessments of the decommissioning and information about possessing by operational entity enough number of staff with suitable knowledge, qualification and experience necessary to dismantle and decommissioning of nuclear facility.

According to the Atomic Law Act and the Council of Ministers Regulation of 10 October 2012 OJ (Dz. U. 2012) item 1213 on amount of payment for the costs of spent nuclear fuel and radioactive waste disposal and cost of NPP decommissioning by the licensee, financial responsibility for decommissioning as well as waste (any) and SNF management coming from the commercial facilities are to be held by the operator. The Council of Ministers established by Regulation the amounts of contributions to cover the costs of spent nuclear fuel and radioactive waste disposal and the costs of nuclear power plant decommissioning by organizational entity authorized to operate a nuclear power plant, taking into account the estimated operation period of the nuclear power plant, the volume of radioactive waste, including spent nuclear fuel, the cost of waste disposal, and the costs of the nuclear power plant decommissioning. The funds for decommissioning and RWM/SNF management are to be saved on a separate account side quarterly. Resources collected on the dedicated bank account can be deposited on fixed-term deposit accounts or invested in long-term bonds emitted by the minister competent in the matters of public finance. The payment should be made for every MWh produced by the nuclear power plant (ca. 4 euros per 1 MWh). Every three months head of the organizational entity is obliged to submit to the MoE a report on the amount of collected funds and the number of megawatts of electricity produced within the relevant period. In a case of minimum 12 months delay in continuing savings, the regulatory body is authorized to stop the operation of the defaulting facility on the request of MoE.

In the decommissioning activity, the provisions of the Convention with respect to operational radiation protection, discharges and unplanned and uncontrolled releases as well as with respect to emergency preparedness will be applied.

Records of information important to decommissioning, i.e. for the only one facility being decommissioned so far – EWA RR, are kept in facility (drawings, technology, waste stored inventory etc.).

Currently, EWA RR building is in use as a headquarters of RWMP, and additionally ZUOP's technical infrastructure such as: I class laboratory, Z class laboratory and shredding unit are located in this building.

According to the Council of Ministers Regulation of 11 February 2013 (Dz. U.2013) item 270 on nuclear safety and radiological protection requirements for the decommissioning stage of a nuclear facility and the content of the safety report on the decommissioning of a nuclear facility there is an obligation to conduct periodic safety review, at least once every 10 years until the decommissioning of a nuclear facility is completed.

Such periodic safety review of EWA reactor was conducted in 2023 and report prepared and submitted to the President of the PAA. The scope of these review includes such topics as:

1) determination of an actual technical condition of systems and structures and components of the nuclear facility through analyzing data obtained from monitoring and measurements and operating experience,
2) updating of data on the amount and activity of radioactive substances present in the nuclear facility,
3) updated safety analyses,
4) organizational issues,
5) radiological protection issues,
6) fulfilment of nuclear safety and radiological protection requirements and the assessment of the effectiveness of management aimed at ensuring safety and quality,
7) staffing of employees and their qualifications,
8) emergency preparedness,
9) radiological impact on the public and the environment,
10) radioactive waste storage conditions,
11) aging of systems and structures and components of the nuclear facility important for ensuring nuclear safety and radiological protection,
12) scientific and technological progress in relation to methods for decommissioning of nuclear facilities,
13) modifications in the surroundings of a nuclear facility taking into account natural and human-induced hazards,
14) changes in nuclear safety and radiological protection requirements included in regulations in force,
15) lessons drawn from experience from decommissioning works that were carried out in a given facility or similar facilities.

SECTION G. SAFETY OF SPENT FUEL MANAGEMENT

This section covers the obligations under the articles 4-10 of the Convention.

ARTICLE 4. GENERAL SAFETY REQUIREMENTS

Text of Article 4:

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

i. ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed;

ii. ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;

iii. take into account interdependencies among the different steps in spent fuel management;

iv. provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

v. take into account the biological, chemical and other hazards that may be associated with spent fuel management;

vi. strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

vii. aim to avoid imposing undue burdens on future generations.

According to Atomic Law Act the fuel management activities as well as the relevant facilities have to be licensed by the President of the PAA. The license is granted on the condition that applicant shall prove fulfillment of all the relevant requirements set forth in the Atomic Law Act and secondary legislation related to the spent fuel and radioactive waste management and also will be able to fulfill the requirements related to particular facility or activity, included in the license conditions.

In particular the radiation protection standards and the spent fuel and radioactive waste safety requirements provided in the Chapters 3, 4 and 7 of the Atomic Law Act (see Annex V) and also the requirements of the Council of Ministers regulation on radioactive waste and spent nuclear fuel, have to be fulfilled. These laws define in particular the terms of storage and disposal of radioactive waste or spent nuclear fuel and the detailed technical requirements imposed on sites, facilities, compartments and packaging intended for the storage of radioactive waste categories as well as the detailed requirements on various types of repositories and their siting, construction, operation and closure.

The criticality and heat removal issues (4i) are directly addressed in the art. 50a of the Atomic Law Act issued:

1. Spent nuclear fuel, subsequent to the cooling period in the reactor pool, shall be stored in a wet storage facility (in aqueous environment) or in a dry storage facility (in inert gas atmosphere), under conditions ensuring that on the spent nuclear fuel element surface the temperature permissible for a given type of nuclear fuel shall not be exceeded, and preventing the occurrence of self-sustaining nuclear fission reaction (preservation of sub-criticality);

2. In calculations demonstrating the preservation of sub-criticality, it shall be admissible to take into account the burn-up level of stored spent nuclear fuel;
3. Preservation of sub-criticality shall be ensured in particular by the following:
   a) maintaining appropriate distance between individual spent nuclear fuel elements,
   b) using neutron absorbers.

The minimalization of waste generation (4ii) is addressed in the art. 48b of the Atomic Law Act:

1. Organizational entity plans and conducts activities involving exposure in manner to prevent the formation of radioactive waste.
2. In cases where due to the nature of the activity involving exposure is not possible to satisfy the requirements referred to in paragraph. 1, an organizational entity in which waste is produced, provides:
   a) the generation of radioactive waste at the lowest reasonably achievable level in terms of volume, activity and radioactive concentration,
   b) minimalization of the impact of these wastes on the environment.

Interdependencies (4iii) have been always important elements of the spent fuel management policy, observed both by the licensees and the regulators, and it is reflected in the Atomic Law Act and Regulations to this Act. Interdependencies of all stages of spent fuel management are described in section B and Annex I. The development of technologies and capacities for long term management of spent nuclear fuel is the responsibility of Polish Government (see Annex I).

The radiological protection (4iv) at the national level is broadly addressed in the Chapter 3 of the Atomic Law Act and relevant several secondary regulations in which internationally endorsed criteria and standards had been incorporated.

As regards the hazards other than radiological (4v), in the situation when operations with spent fuel in Poland limited only to wet storage, the serious chemical and other important hazards do not exist. Nevertheless the general rules of health protection in work are always applied and relevant regulation's requirements have to be observed and satisfied.

Aim to avoid impacts (4vi) and undue burdens (4vii) on future generations is reflected in the Atomic Law Act: art. 52 states that: Radioactive Waste shall be disposed in solid form and packaged in a manner which ensures safety of humans and environment from the radiological protection viewpoint (…) during the operation of the repository and after closure. Art. 55f of the Atomic Law Act states that the annual effective dose from all exposure pathways shall not exceed 0,1 mSv after closure of the repository.

ARTICLE 5. EXISTING FACILITIES

Text of Article 5:

Each Contracting Party shall take the appropriate steps to review the safety of any spent fuel management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility.

According to art. 37e of the Atomic Law head of the organizational entity shall perform periodic safety review (PSR). The exact time interval will be established in the license but should not exceed 10 years. Detailed periodic safety review plan needs to be approved by the President of the PAA. Based on the periodic safety review, the head of the organizational entity shall draw up a periodic safety review report to be submitted to the President of the PAA for approval until by the deadline stated in the license for the nuclear facility operation.

Regulation of the Council of Ministers of 27th December 2011 on periodic safety review of a nuclear facility provides for a detailed scope of this review and a scope of periodic assessment report. The assessment should include inter alia review of design solutions, status of SSCs important to safety, review of safety classification of SSCs, issues related to the natural wear and tear of SSCs important to safety, deterministic analyses, probabilistic analyses and review of ageing of SSCs important to safety. If - based on the conclusions from the periodic assessment report - it is considered necessary from the viewpoint of nuclear safety, radiological protection, physical protection and nuclear material safeguards, the President of the PAA is authorized to amend the conditions of activities covered by the license. First PSR for MARIA RR was performed by licensee in 2018-2019 and during review licensee assessed 13 safety factors including in relation to radioactive waste: ageing management (partially regarding spent fuel pool and waste treatment system) and radiological impact on the environment with consideration of radioactive waste management. Based on the results of review, licensee has identified number of corrective actions for different safety factors. None of them was connected with radioactive waste and spent nuclear fuel management. The second PSR for MARIA RR was conducted in 2023-2024 and based on the performed safety review, the head of NCBJ drawn up a periodic safety review report and submitted it to the President of the PAA for approval. Currently the review and assessment of the submitted report are underway. Moreover detailed periodic safety review plans for two spent nuclear fuel storages have been approved by the President of the PAA in 2021. Based on the safety review plans the head of the organizational entity operating spent nuclear fuel storages drawn up a periodic safety review reports and submitted them to the President of the PAA for approval in 2022. Based on the results of review, licensee has identified number of corrective actions for different safety factors. These reports were approved by the President of the PAA in 2023.

ARTICLE 6. SITING OF PROPOSED FACILITIES

Text of Article 6:

1. Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:

i. to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;

ii. to evaluate the likely safety impact of such a facility on individuals, society and the environment;

iii. to make information on the safety of such a facility available to members of the public;

iv. to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.

Requirements connected with siting of nuclear facilities (spent nuclear fuel storage facilities) are established in art. 35b, 36 and 36b of the Atomic Law Act and supporting Council of Ministers regulation on the detailed scope of assessment with regard to land intended for the site of a nuclear facility, cases excluding land to be considered eligible for the site of a nuclear facility and on requirements concerning siting report for a nuclear facility. The license holder (or before the issuance of the license - investor) being liable for nuclear

safety should independently evaluate the terrain for the prospect site of a nuclear facility using methods of evaluation that yield quantifiable results and appropriately reflect the actual conditions of such terrain. Such an evaluation is the prerequisite for selecting the site for a nuclear facility, and concerns:

1) seismic, tectonics, geological, geo-engineering, hydrogeological, hydrological and meteorological conditions;
2) human-induced external hazards;
3) external hazards attributed to the forces of nature;
4) population density and land development;
5) conditions for the employment of emergency measures in response to a radiological emergency.

The investor needs to prepare the results of the terrain evaluation for the prospective site of a nuclear facility, together with the results of tests and measurements that are the basis for such evaluation, in the form of a site-evaluation report. The site-evaluation report will be subject to assessment by the President of the PAA in the process of issuing a licence for the construction of a nuclear facility. No separate siting licence will be introduced. Before applying for a nuclear facility construction licence, the investor can apply to the President of the PAA for a preliminary assessment of the site of a future nuclear facility.

The public involvement and information issues are guaranteed and regulated by the law, specifically, by the Act on Access to Information on the Environment and Its Protection and on Environmental Impact Assessments. Therefore, the public has right to express its opinion and issue remarks on any planned facility or activity in the course of the EIA procedure, where public hearings and discussions are held within this procedure. Except of this, any citizen may issue a written request on specific information of their interest, e.g. on the results of inspections, periodical reviews, issued opinions or any other issues.

PAA President provides also general information on the safety available to members of the public according to art. 39d of the Atomic Law Act.

Poland is also part of Espoo Convention which imposes an obligation to allow the neighboring countries to participate in EIA procedures related to facilities which can affect the territory of neighboring country.

ARTICLE 7. DESIGN AND CONSTRUCTION OF FACILITIES

Text of Article 7:

Each Contracting Party shall take the appropriate steps to ensure that:

i. the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

ii. at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;

the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.

The requirements regarding the design and construction of spent fuel management facility will provide for suitable measures to limit possible radiological impacts on individuals, society and the environment.

General provisions for the nuclear facility design, which include the prevention of accidents, are provided by art. 36c of the Atomic Law Act. More detailed requirements are

contained in the Regulation of the Council of Ministers of 31st August 2012 on nuclear safety and radiation protection requirements which must be fulfilled by a nuclear facility design.

Under the provision of the art. 36b of the Atomic Law Act, it is required that in the design and construction process of a nuclear facility, no solutions or technologies shall be used which have not been demonstrated to be appropriate in practice in other nuclear facilities, or by means of tests, studies and analyses.

During the construction and manufacture of the facility systems, structures and components, nuclear regulatory inspectors and inspectors from the Office of Technical Inspection will conduct inspections to ensure that high technological standards are met at every step of the construction. Experience of the Office of Technical Inspection inspectors will be a significant asset in the inspection process. Equipment classification and qualification are also required to provide for the high quality and reliability of used equipment. The required reliability of a given safety group for each postulated initiating event, with the assumption of a single failure, shall be ensured by the appropriate choice of technical solutions, which cover the usage of proven components, redundancy, diversity, physical and functional separation and the isolation of components.

According to the paragraph 106 of the Regulation on nuclear safety and radiation protection requirements which must be fulfilled by a nuclear facility design, facilities and components of equipment of the nuclear facility used for storage of irradiated nuclear fuel at the nuclear facility, as well as components of equipment used for the shipment of irradiated nuclear fuel at the nuclear facility, shall be designed so as to:

1) prevent the occurrence of criticality conditions, with the use of measures or physical processes, in particular thanks to the application of geometrically safe configurations so that in anticipating the storage of nuclear fuel with maximum content of fissile materials:
   a) in items and components of equipment of the nuclear facility used for the storage of irradiated fuel and in components of equipment of the nuclear facility used for the shipment of nuclear fuel, in which it is not anticipated to use water containing neutron absorber, the effective neutron multiplication factor during accident situations assumed in the nuclear facility design, including flooding with water not containing neutron absorber, shall not exceed 0.95;
   b) in items and components of equipment of the nuclear facility used for the storage of irradiated fuel and in components of equipment of the nuclear facility used for the shipment of irradiated nuclear fuel, in which it is anticipated to use water containing neutron absorber, the effective neutron multiplication factor shall not exceed 0.95 – when flooding with water containing neutron absorber, and a value of 0.98 – in the event of emergency flooding with water not containing neutron absorber,
2) facilitate appropriate heat collection from nuclear fuel in operational states and accident
   conditions,
3) facilitate the control of irradiated fuel,
4) facilitate the performance of periodic controls and tests of components of equipment which are important for nuclear safety,
5) prevent nuclear fuel from being dropped during movement,
6) prevent inadmissible stress in fuel elements or fuel assemblies, connected with their movement,
7) prevent the unintentional dropping of heavy objects onto the fuel assemblies, in particular:

   a. spent nuclear fuel flasks, components of equipment for shipment of irradiated nuclear fuel;
   b. or other objects, which could potentially damage the nuclear fuel;
8) facilitate the safe storage of fuel elements or fuel assemblies which are damaged or presumed to be damaged,
9) ensure the appropriate protection against ionizing radiation,
10) control the concentration of soluble absorbers, if they are used for ensuring safety in terms of maintaining sub-criticality,
11) facilitate the repair and decommissioning of components of nuclear facility equipment used for movement or storage of nuclear fuel,
12) facilitate, if required, the deactivation of locations and components of nuclear facility equipment used for movement or storage of nuclear fuel,
13) ensure the identification of particular fuel assemblies,
14) ensure the possibility of implementing operational procedures and the record and control system with the purpose of preventing the loss of nuclear fuel.

Paragraph 107 of the above mentioned regulation states that in the nuclear facilities, in which irradiated nuclear fuel is stored in water pools, design solutions shall additionally take into account technical solutions:

1) for controlling chemical composition and water activity, in which irradiated nuclear fuel is stored or transferred,
2) for monitoring and controlling the level of water in the pool for storing nuclear fuel and detecting leakage,
3) which prevent a drop in the level of water in the pool used for storing nuclear fuel,
4) technical measures for measuring and registering temperature in the pool used for storing nuclear fuel.

Paragraph 104 indicates that filter systems at the nuclear facility shall be designed so that:

1) under anticipated dominating conditions of operation the required retention coefficients are attained,
2) it is possible to test their effectiveness.

Paragraph 50 of the Regulation of the Council of Ministers of 31st August 2012 on nuclear safety and radiation protection requirements which must be fulfilled by a nuclear facility design states that the design of a nuclear facility shall take into account solutions facilitating the decommissioning of the nuclear facility, in particular:

1) the selection of materials so as to minimize the quantity of radioactive waste and facilitate deactivation of dismantled elements,
2) the access to those places where access is necessary,
3) the need to minimize workers exposure to ionizing radiation and the prevention of environmental contamination with radioactive substances when dismantling nuclear facility,
4) facilities required for storing of radioactive waste generated during the operation and decommissioning stages of the nuclear facility.

Under the provision of the art. 36c. 1 of the Atomic Law Act, it is required that nuclear facility design shall take into account the necessity to ensure nuclear safety, radiological safety and physical protection in the course of construction, commissioning, operation, including repairs and modernization, and decommissioning of the facility, as well as conditions for a prompt emergency response in the event of a radiation emergency.

ARTICLE 8. ASSESSMENT OF SAFETY OF FACILITIES

Text of Article 8:

Each Contracting Party shall take the appropriate steps to ensure that:

- **i. before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;**
- **ii. before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).**

The requirements to perform appropriate safety assessments of the presumable spent fuel facility to be constructed or operated and to submit the relevant safety documentation to the President of the PAA, is prerequisite to obtain the relevant licenses for this stages. More information about safety assessment is provided in Section E article 19.

ARTICLE 9. OPERATION OF FACILITIES

Text of Article 9:

Each Contracting Party shall take the appropriate steps to ensure that:

- **i. the licence to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;**
- **ii. operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;**
- **iii. operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;**
- **iv. engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;**
- **v. incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;**
- **vi. programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;**
- **vii. decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.**

According to the art. 4 of the Atomic Law activities involving ionizing radiation require licenses, which is issued by the President of the PAA after ascertaining that the conditions and requirements relevant to radiation and nuclear safety have been met and fulfilled at the

given stage. This means in particular that the operation of a facility without a license is prohibited. At each of the stage the applicant/licensee must submit to the President of the PAA, together with his application for a license, a proper safety documentation of the facility. The results of the review and assessment of this documentation provide the basis for the regulatory body to prepare an appropriate license and to specify the relevant requirements and conditions in the text of license document.

Under the provision of the art. 37c. 1 of the Atomic Law Act, it is required that the head of the organizational entity performing exposure-related activities involving the operation of a nuclear facility shall keep records on the day-to-day operation of the nuclear facility, collect and analyze on an ongoing basis the nuclear facility operating parameters which are important for the nuclear safety and radiation protection, in consideration of the operating experience so far and provide the President of the PAA with ongoing information on nuclear facility operating parameters relevant to nuclear safety and radiation protection.

More detailed requirements are contained in the Regulation of the Council of Ministers of 11th February 2013 on requirements for the commissioning and operation of nuclear facilities, commissioning and operation of the nuclear facility. According to the paragraph 2 of the above-mentioned regulation, commissioning and operation of the nuclear facility shall be performed in accordance with operational limits and conditions. Operational limits and conditions shall be subject to reviews during commissioning and operation of the nuclear facility.

Paragraph 3. section 2 of the regulation states operational limits and conditions shall include at least:

1) safety limits,
2) limiting settings for safety systems,
3) limits and conditions for normal operation,
4) requirements concerning inspection and surveillance over the systems, structures and components of the nuclear facility important for ensuring nuclear safety and radiological protection,
5) minimum required staffing of operational personnel, including the control room operators.

Paragraph 33 section 1 states that operation of the nuclear facility shall be conducted in accordance with operating procedures developed, verified, approved, modified and revoked according to the principles set out in the integrated management system. Operating procedures of the nuclear facility shall be developed on the basis of the design documentation, in particular the safety analysis report, also on the basis of operational limits and conditions and the results of nuclear facility commissioning.

According to the paragraph 37 section 1, activities of maintenance, testing, surveillance and inspection of the systems and structures and components of the nuclear facility important for ensuring nuclear safety and radiological protection shall be performed in accordance with the program developed and implemented by the head of organizational entity possessing the license for operation of the nuclear facility [licensee]. The program, as referred to in point 1, shall in particular:

1) take into account the operational limits and conditions and other requirements contained in the license for operation of the nuclear facility,
2) include:
   a) systematic assessments in order to confirm that the systems and structures and components of the nuclear facility that are important for ensuring nuclear safety and radiological protection are capable of performing their functions in the operational states and in accident conditions,

b) the management of aging processes including the identification of aging effects and activities in order to ensure the reliable performance of required safety functions by the systems and structures and components in the whole period of operation of the nuclear facility, taking into account in particular long-term processes of their degradation occurring due to operational and environmental conditions.

Paragraph 38 section 1 states that activities of maintenance, testing, surveillance and inspection of the systems and structures and components of the nuclear facility that are important for ensuring nuclear safety and radiological protection shall be performed in accordance with the procedures constituting a part of the program as referred to in paragraph 37 Section 1 with the frequency ensuring the reliability and functioning of the required number of these systems and structures and components in compliance with the design assumptions and safety analysis report of the nuclear facility.

Operational documentation of the nuclear facility shall comprise in particular:

1) design specifications,
2) safety analyses and assessments of fire hazards,
3) data on the supply of devices and materials,
4) as-installed documentation,
5) documentation on the structures and components of the nuclear facility delivered by the manufacturers or suppliers,
6) commissioning documentation,
7) operating procedures,
8) data on the operation of the facility (operational reports),
9) reports on events and incidents in the nuclear facility,
10) registers of amounts and movements of: fissionable and fertile materials, radioactive substances and other special materials and substances,
11) documents on the maintenance, testing, surveillance and inspection,
12) history and documentation regarding modernizations and modifications of the nuclear facility,
13) quality assurance documentation,
14) data on qualifications of the employees, staffing of positions, medical examinations and trainings,
15) reports concerning water-chemical regime,
16) registers of doses received by employees,
17) data on the supervision of radiation hazards in the rooms and on the site of the nuclear facility,
18) registers of releases of radioactive substances to the environment,
19) data from radiological monitoring of the environment,
20) data concerning storage and transport of radioactive waste,
21) periodic safety analyses.

According to the paragraph 44 section 1 experience from the operation of the nuclear facility shall be subject to systematic assessment. It shall refer in particular to extraordinary events in the nuclear facility in order to identify their causes. Where justified, suitable corrective measures shall be taken immediately on the basis of conclusions drawn from the assessment as referred to in Section 1. Information resulting from the examination of events important from the viewpoint of nuclear safety or radiological protection, and also conclusions drawn from this examination shall be submitted to the employees of the nuclear facility. In

order to draw conclusions regarding the operation of the nuclear facility, information shall be obtained and assessed with regard to operating experience of other domestic and foreign nuclear facilities, especially those of similar type. In order to detect states, situations or deficiencies which could potentially lead to deviations from the normal operation, assigned employees of the nuclear facility shall conduct appropriate analyses of operating experience so that it shall be possible to take necessary countermeasures to prevent such events. Internal procedures which are applicable in the nuclear facility shall oblige the nuclear facility's employees to notify the head of the organizational entity [licensee] about any events related to nuclear safety or radiological protection and shall also encourage employees to inform about the events which potentially could lead to adverse effects from the viewpoint of nuclear safety or radiological protection. Data on operating experience shall be collected, documented and kept in the manner enabling their easy retrieval and obtaining and performing the evaluation by authorized employees of the nuclear facility.

A decommissioning programme of the nuclear facility shall be prepare, prior to the application for a license for construction, commissioning or operation of a nuclear facility, by the head of the organizational entity and submit to the President of the PAA for approval together with the license application as it is state in the art. 38b. 1 of the Atomic Law Act. This programme shall be updated during the operation of a nuclear facility at least once every five years and shall be submitted to the President of the PAA for approval together with a forecast of the costs of decommissioning of this facility.

Art. 50 of Atomic Law states that radioactive waste and spent nuclear fuel shall be stored in conditions allowing their segregation and, in a manner, ensuring the protection of humans and the environment. Spent nuclear fuel, after the cooling period in the reactor pool, shall be stored in a wet storage facility (in an aqueous environment) or in a dry storage facility (in an inert gas atmosphere), under conditions ensuring that on the spent nuclear fuel element surface the temperature permissible for a given type of nuclear fuel shall not be exceeded, and preventing the occurrence of self-sustaining nuclear fission reaction (preservation of sub-criticality).

The spent fuel storage facilities No. 19, 19A and MARIA reactor have appropriate valid licenses for operation, issued by the PAA President after assessment of safety of those facilities performed by regulatory inspectors on the basis of submitted safety documentation as well as inspections findings in the facilities. More information about safety assessment is provided in Section E article 19. The licenses include operational limits and conditions. In-service inspection programmes are performed by the facilities' Operators and relevant reports are regularly submitted for review to the PAA. Engineering and technical support is provided if necessary. Operating experience is documented and reported to the PAA. Incidents are notified through established emergency channels.

Decommissioning programme and the prognosis of the costs of decommissioning for MARIA RR was accepted by the PAA President in 2021.

Decommissioning programmes and the prognosis of the costs of decommissioning for spent nuclear fuel storage facilities No. 19 and 19A were accepted by the PAA President in 2020.

ARTICLE 10. DISPOSAL OF SPENT FUEL

Text of Article 10:

If, pursuant to its own legislative and regulatory framework, a Contracting Party has designated spent fuel for disposal, the disposal of such spent fuel shall be in accordance with the obligations of Chapter 3 relating to the disposal of radioactive waste.

The spent fuel disposal in Poland remains at research and planning stage only. Up to now no spent fuel has been designated for disposal, all existing spent fuel from research reactors (HEU) has been shipped to Russian Federation.

Some preliminary studies on possible siting for deep geological repository has been performed within Strategic Governmental Programme (1997-1999). The review of geological structure of the country has been done, from the point of view of possible potential sites. It was found that granite bedrocks in Poland are not suitable for repository placing due to their extensive fracturing. The deposit of homogenous clay rocks and 3 salt domes fulfilling siting criteria were chosen for further examination.

At present, site selection for deep geological repository lies within the competence of the Ministry in charge of energy. In the year 2014 initiate studies on the possible sites for deep geological disposal begun and a project of Polish Underground Research Laboratory PURL as a common idea of research institutions has arisen. It is intended to continue research and development on deep geological repository undertaken in Poland in the late 90s of last century. More details of current state of the activities is given in the Annex I.

SECTION H. SAFETY OF RADIOACTIVE WASTE MANAGEMENT

This section covers the obligations under the articles 11-17:

ARTICLE 11. GENERAL SAFETY REQUIREMENTS

Text of Article 11:

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.
In so doing, each Contracting Party shall take the appropriate steps to:

1. **ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;**
2. **ensure that the generation of radioactive waste is kept to the minimum practicable;**
3. **take into account interdependencies among the different steps in radioactive waste management;**
4. **provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;**
5. **take into account the biological, chemical and other hazards that may be associated with radioactive waste management;**
6. **strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;**
7. **aim to avoid imposing undue burdens on future generations.**

According to the Atomic Law Act, the radioactive waste management activities as well as the relevant facilities have to be licensed by the President of the PAA.

The license is granted on the condition that the applicant demonstrates that it meets all the relevant requirements set forth in the Atomic Law Act and secondary legislation related to the radioactive waste management and is able to fulfill the requirements related to particular facility or activity set out in the license conditions.

In particular, the general radiation protection standards and the radioactive waste safety requirements laid down in the Chapters 3, 4 and 7 of the Atomic Law Act (see Annex V) and also the provisions of the Council of Ministers regulation on radioactive waste and spent nuclear fuel have to be fulfilled. This regulation defines in particular the conditions for storage and disposal of radioactive waste or spent nuclear fuel, as well as the detailed technical requirements for sites, facilities, compartments and packages intended for the storage of radioactive waste categories, and the detailed requirements for various types of repositories and their siting, operation, construction and closure.

The interdependencies between the different steps of spent fuel management and radioactive waste management are addressed in the National Plan, adopted by the Polish Government. The interdependencies in radioactive waste management are achieved through a common understanding between all interested parties (waste generators, waste management plant and regulatory body) regarding waste characteristic, packaging requirements, transport specifications, etc. Waste generators collect, segregate and store radioactive waste in a manner that is suitable for further transport, processing and disposal.

Close cooperation between the waste generators and ZUOP in the field of developing and following limits and conditions included in the safety case is aimed at the safe final disposal of radioactive waste.

ARTICLE 12. EXISTING FACILITIES AND PAST PRACTICES

Text of Article 12:

Each Contracting Party shall in due course take the appropriate steps to review:

- **i. the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;**
- **ii. the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.**

The National Radioactive Waste Repository in Różan is the only repository in Poland. Some years ago, releases of tritium have been observed. Detailed information on the releases can be found in the previous National Reports.

Since the last JC review meeting from 2022 to the first quarter of 2024, the tritium concentrations (depending on the seasonal and meteorological changes) varied from 3539 to 6107 Bq/dm^3 in the piezometer located in the immediate vicinity of the facility No. 2 (potential source of release). It should be added that the tritium concentration at this point has been systematically decreases since 2015. In order to improve the safety of the repository a new safety report was prepared together with accompanying documents including geological and engineering documentation and hydrogeological documentation and all documents were submitted to the President of the PAA for updating operating license. The updated license was issued in May 2024.

ARTICLE 13. SITING OF PROPOSED FACILITIES

Text of Article 13:

1. **Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:**
   - **i. to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;**
   - **ii. to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;**
   - **iii. to make information on the safety of such a facility available to members of the public;**
   - **iv. to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.**

2. In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 11.

Requirements related to the siting of radioactive waste disposal are established in art. 53a, 53b, 53c, 53d of the Atomic law and the supporting Regulation of Council of Ministers on radioactive waste and spent nuclear fuel.

The issue of public involvement and information are guaranteed and regulated by the law, in particular by the Act on Access to Information on the Environment and Its Protection and on Environmental Impact Assessments. Therefore, the public has the right to express its opinion and issue remarks on any planned facility or activity in the course of the EIA procedure, where public hearings and discussions are held as part of this procedure. In addition, any member of the public may submit a written request for specific information of interest to them, such as the results of inspections, periodic reviews, opinions issued or other issues.

The President of the PAA also regularly provides the public with general information on safety in accordance with art. 55n of the Atomic Law Act.

ARTICLE 14. DESIGN AND CONSTRUCTION OF FACILITIES

Text of Article 14:

Each Contracting Party shall take the appropriate steps to ensure that:

i. the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

ii. at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

iii. at the design stage, technical provisions for the closure of a disposal facility are prepared;

the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

According to the Atomic Law Act and secondary legislation the technical criteria and requirements for the design and construction of radioactive waste management facilities include provisions for appropriate measures to limit possible radiological impacts on individuals, society and the environment. As states in the art 55f. 1 of the Atomic Law Act a radioactive waste repository shall be constructed, operated and closed in such a manner as to ensure radiation protection of workers and the public, in accordance with a license issued by the President of the PAA and with the integrated management system implemented in the organizational entity. Under the art. 55e of the Atomic Law Act it is required that the design of a radioactive waste repository shall in particular take into account the need to ensure radiation protection, physical protection and the necessity to maintain sub-criticality during and after the repository's operation and closure, take into account the sequence of successive containment barriers ensuring that the requirements ensuring radiation protection, physical protection are met, even in the event of failure of one of the barriers and includes solutions that enable the safe, stable, manageable and secure operation and closure of the radioactive waste repository.

Requirements regarding location and construction of predisposal waste management facilities are described in the Regulation on radioactive waste and spent nuclear fuel and the Regulation on the detailed safety requirements for work involving ionizing radiation sources. One of the document that has to be submitted with license application for a predisposal radioactive waste management facilities or activities is technical documentation of the facility or premises in which the activity which is the subject of the application will be performed, indicating the fulfilment of nuclear safety and radiological protection conditions. Such facility or premises shall fulfilled specific requirements which are described in Regulation on radioactive waste and spent nuclear fuel and Regulation on the detailed safety requirements for work involving ionizing radiation sources.

Art. 50. 1 of the Atomic Law Act says that radioactive waste and spent nuclear fuel shall be stored in the manner ensuring protection of people and the environment in terms of radiological protection under normal conditions and during radiation emergencies, in particular, securing these substances against spilling, dispersion or release. This means that facilities shall be designed and constructed in a way so as to ensure safety under normal and radiation emergencies conditions. Moreover in case of nuclear facility paragraph 103 of the Regulation on nuclear safety and radiation protection requirements which must be fulfilled by a nuclear facility design states that the nuclear facility design shall provide for systems or components of equipment of the nuclear facility used for the transport of radioactive waste and its safe storage on the premises of the nuclear facility, including systems and components of equipment of the nuclear facility used for the storage of gas and liquid radioactive waste, particularly if it is anticipated that unfavourable environmental conditions in the area of nuclear facility location could periodically impose extraordinary constraints regarding its controlled discharge into the environment. The design of the radioactive waste repository allows: continuous monitoring of the fulfilment of the design objectives for the safety of the repository, preservation of the natural characteristics of the selected site to ensure the long-term safety of the repository after closure and closure of the repository before the scheduled date, if necessary (art. 55h of the Atomic Law Act).

Under the art. 52.1 of the Atomic Law Act, radioactive waste, liquid or gaseous, arising from activities with ionizing radiation may be discharged to the environment provided that its activity concentration in the environment can be disregarded from the point of view of radiation protection. The method of discharge, the activity of the discharged waste and its allowable activity concentration at the time of discharge into the environment shall be laid down in the license, taking into account existing good practices worldwide and the results of the optimization of radiation protection. The organizational entity which discharges radioactive waste into the environment shall perform monitoring of releases of radioactive substances into the environment to verify that the annual effective doses from all exposure routes received by members of the public are kept at the lowest reasonably achievable level, and shall systematically analyze the results of this monitoring and submit them without delay, at the request of the President of the PAA.

ARTICLE 15. ASSESSMENT OF SAFETY OF FACILITIES

Text of Article 15:

Each Contracting Party shall take the appropriate steps to ensure that:

- **i. before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;**
- **ii. in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;**

iii. before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

The requirements to carry out appropriate safety assessments of a radioactive waste management facility to be constructed or operated and to submit the relevant safety documentation to the President of the PAA, is a prerequisite for obtaining the relevant licenses for these stages. Further information on safety assessment is provided in Section E Article 19.

ARTICLE 16. OPERATION OF FACILITIES

Text of Article 16:

Each Contracting Party shall take the appropriate steps to ensure that:

i. the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

ii. operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;

iii. operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;

iv. engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;

v. procedures for characterization and segregation of radioactive waste are applied;

vi. incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

vii. programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

viii. decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

ix. plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.

The Radioactive Waste Management Plant as well as the National Radioactive Waste Repository in Różan have appropriate valid operating licenses issued by the President of the PAA after the safety of this facilitiy has been assessed by regulatory inspectors on the basis of submitted safety documentation and the findings of inspections at the facility. According to

art. 52 of the Atomic Law Act, the license includes operational limits and conditions. Operation, maintenance, monitoring, inspection and testing programmes are carried out by the operator of the facility and relevant reports are regularly submitted to the PAA`s Nuclear Safety and Security Department for review. Operating experience is documented and reported to the PAA. Incidents are reported through established emergency channels. In accordance with art. 55j the head of the organizational entity before applying for the license for construction or operation has to prepare the closure programme which must be approved by the PAA President. The programme must be regularly updated throughout the entire lifetime (not less than every 15 years).

ARTICLE 17. INSTITUTIONAL MEASURES AFTER CLOSURE

Text of Article 17:

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

- **i. records of the location, design and inventory of that facility required by the regulatory body are preserved;**
- **ii. active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and**

if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

It is planned that the Różan repository will be operated until start of the operation of the new NSRWR. On the basis of the updated safety report for the closure of the repository, which will be prepared by ZUOP, the schedule for institutional control and post-closure activities will be established. The post-closure safety report will define the scope of this activity. The obligation of Article 17 of the Convention has also been addressed in this report.

SECTION I. TRANSBOUNDARY MOVEMENT

This section covers the obligations under the article 27 of the Convention.

ARTICLE 27. TRANSBOUNDARY MOVEMENT

Text of Article 27:

1. Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.

In so doing:

- **i. a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;**
- **ii. transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;**
- **iii. a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;**
- **iv. a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;**
- **v. a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.**

2. A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.

3. Nothing in this Convention prejudices or affects:

- **i. the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;**
- **ii. rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;**
- **iii. the right of a Contracting Party to export its spent fuel for reprocessing;**
- **iv. rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.**

"Chapter 8a" of the Atomic Law Act, the Regulation of the Council of Ministers on the issuance of the permits for the import into, export from, and transit through the territory of Poland of radioactive waste, and the Regulation of the Council of Ministers on the issuing of the permits for the import to, export from, and transit through the territory of Poland of spent nuclear fuel, regulate all issues related to transboundary movements and implements the relevant European Commission directives.

According to the art. 62c of Atomic Law Act, for the radioactive waste and SNF export, import from a third country, and transit through the territory of Poland if the shipment is performed between third countries and Poland is the first Member State, a license issued by the President of the PAA must be obtained. Art. 62c also specifies the conditions that must be met to obtain aforementioned license for each type of activity connected to transboundary movements, as follows:

1) authorization by the competent authority of the transit Member State for the transit of radioactive waste or SNF;
2) in the case of export of radioactive waste and SNF from Poland, a consent by the competent authority of the country of destination for import of radioactive waste or SNF into its territory, and a commitment submitted by the holder to receive the radioactive waste and SNF in the situation, when the shipment cannot be finalized, and also to cover the expenses related to uncompleted shipment;
3) in the case of import of radioactive waste and SNF from a third country, where radioactive waste is imported into the territory of Poland for a purpose other than disposal or SNF, a conclusion by the consignee of an agreement with the holder, recognized by the competent authority of the holder's country, obliging the holder to collect radioactive waste or SNF where the shipment cannot be completed, and radioactive waste resulting from the reprocessing of radioactive waste covered by the application for a shipment license, radioactive waste resulting from the reprocessing of SNF, and other products resulting from the reprocessing of radioactive waste or the reprocessing of SNF;
4) in the case of import from a third country, where radioactive waste is imported into the territory of Poland for storage, a conclusion by the consignee of an agreement with the holder, recognized by the competent authority of the holder's country, obliging the holder to collect the radioactive waste when the shipment cannot be completed, and the consignee to dispose of radioactive waste on the territory of Poland, and a guarantee that consignee has the means to dispose of the radioactive waste of foreign origin without jeopardizing the capability to dispose the domestic radioactive waste;
5) in the case of transit of radioactive waste and SNF through the territory of Poland if the shipment is performed between third countries and Poland is the first Member State, an agreement between the consignee and the holder, recognized by the competent authority of the holder's State, obliging the holder to collect radioactive waste or SNF where the shipment cannot be completed.

The license is issued for a definite period, not exceeding 3 years, upon the application by the holder, consignee, or the organizational entity responsible for organizing the shipment within the territory of Poland, depending on the activity for which the application is submitted.

Art. 62d further describes the cases where the consent issued by the President of the PAA is required, which includes import of radioactive waste and SNF from a Member State and transit of radioactive waste and SNF through the territory of Poland in cases other than specified in art. 62c. In order to obtain the consent for the import of radioactive waste and SNF from a Member State: a conclusion by the consignee with the holder of the agreement recognized by the competent authority of the holder's country must be provided in the cases where radioactive waste is imported into the territory of Poland for purposes other than disposal or SNF, and the requirements referred to in art. 62c as described in point 4. must be fulfilled in the case where radioactive waste is imported into the territory of Poland for the

purpose of storage. The President of the PAA may also make the issuance of consent subject to additional conditions, which may not be more strict than those laid down for a similar shipment made between a holder and a consignee located within Poland.

The Atomic Law Act also establishes the cases of prohibition of export of radioactive waste and SNF from Poland, which includes destinations located south of the 60th degree of south latitude and third countries lacking the means for the safe management of radioactive waste and SNF. The President of the PAA may also decide to discontinue the shipment in the event of breach of the conditions for conducting the shipment that are set out in respective provisions of law, license, or consent, and the notification is made through the decision. Each issuance of license, consent or decision of the President of the PAA connected to transboundary movement is immediately reported to the Head of the Internal Security Agency, the Commander-in-Chief of the Border Guard, and the Head of the National Customs Service.

The specific requirements with regards to the procedure for issuing a license and consent, the documents to be attached to the application for the license and to the application for the consent, and the steps to be taken by the entities involved in the shipment and the President of the PAA after the shipment has taken place, guided by the necessity to ensure effective control of shipments of radioactive waste and spent nuclear fuel, are described in Council of Ministers regulation on the issuing of the permits for the import to, export from, and transit through the territory of Poland of radioactive waste, and regulation on the issuing of the permits for the import to, export from, and transit through the territory of Poland of SNF.

The shipments of the SNF to the Russian Federation, which have been described in more detail in Sections B and D of the Report, were carried out in accordance with the prevailing international and State regulations (see Annexes IV, V and VI).

SECTION J. DISUSED SEALED SOURCES

This section covers the obligations under the article 28 of the Convention.

ARTICLE 28. DISUSED SEALED SOURCES

Text of Article 28:

1. **Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.**
2. **A Contracting Party shall allow for re-entry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.**

According to the art. 5 of the Atomic Law Act, a license shall be issued, or the registration shall be accepted, after establishing that the conditions required by law for performing exposure-related activities and requiring a license or registration have been fulfilled. Moreover a license for performing activities involving a high-activity sealed source shall be issued provided that the organizational entity applying for the license has also concluded an agreement with the manufacturer or supplier of a high-activity sealed source under which the manufacturer or supplier undertakes to collect the source after the source-related activities have been terminated, and to ensure subsequent management of the source, and which regulates the terms of financial security to cover the cost of source collection and management, or an agreement with the Radioactive Waste Management Plant under which this company undertakes to collect the source after the source-related activities have been terminated and to ensure subsequent management of the source, and which regulates the terms of financial security to cover the cost of source collection and management. The President of the PAA, given the interest of radiation protection, may, in the case of a high-activity sealed source imported into the territory of the Republic of Poland, condition the issuance of the license on the conclusion of the agreement by the organizational entity applying for the license, if the management of this source in the territory of the Republic of Poland after terminating the activity involving this source might be impossible or significantly hindered.

All disused sources are registered in the National Register of Sealed Sources. The disused sealed sources are collected by ZUOP.

Poland allows the re-entry of disused sealed sources into its territory for return to a manufacturer. The disused sealed sources of foreign origin, which have used in Poland and cannot be returned to the foreign manufacturer, constitute a separate category of waste and are safely stored by the ZUOP.

SECTION K. GENERAL EFFORTS TO IMPROVE SAFETY

During the period covered by this Report, Poland worked on the challenges identified at the last meeting:

1) When new technologies are selected, revise spent fuel and radioactive waste management practices to remain fit for purpose
2) Management of research reactor spent fuel after short-term storage in unplanned circumstances.

Representatives of the nuclear regulatory body participate in joint initiative with other nuclear regulatory authorities to identify and address licensing challenges for new types of reactors. The PAA meets potential investors to discuss a range of issues, including the management of radioactive waste and spent nuclear fuel. We are continuously seeking for information and studies regarding on the nature of radioactive waste and spent nuclear fuel generated by new types of reactors.

Two spent fuel storages operated by ZUOP undergone periodic safety review. Detailed plans for periodical safety review were approved by the President of the PAA in 2021, and based on the periodic safety review, the head of organizational entity prepared a periodic safety review reports and submitted to the President of the PAA for approval. These reports were approved by the President of the PAA in 2023. The assessment included review of design solutions, status of SSCs important to safety, review of safety classification of SSCs, issues related to the natural wear and tear of SSCs, deterministic analyses, probabilistic analyses and review of ageing of SSCs. If, based on the conclusions from the periodical assessment report, it is considered necessary from the point of view of nuclear safety, radiological protection, physical protection and nuclear material safeguards, the President of the PAA is authorized to amend the conditions of the activities covered by the license. Based on the results of the review, the licensee has identified a number of corrective actions for various safety factors and assigned a timeframe for their implementation.

In order to improve the safety of a repository a new safety analysis report was prepared together with accompanying documents including geological and engineering documentation and hydrogeological documentation and all documents were submitted to the President of the PAA to amend license for operation. The amended license was granted in May 2024.

In addition, Poland continued to work on the effective implementation of the National Plan for management of radioactive waste and spent nuclear fuel. Further details of this work are provided in Annex I. Moreover the PAA Agency has been working to maintain an adequate level of resources in the face of a significant new build program. Further details are provided in Article 20.

SECTION L. ANNEXES

Annex I **Information on the implementation of the obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management – Department of Nuclear Energy**

Annex II **Activity and Activity's Concentration being base of radioactive waste classification**

Annex III **Activity of Isotopes in the waste stored/disposed at the NRWR-Różan in the years 1961 – 31.12.2019**

Annex IV **International Conventions related to safe utilization of Atomic Energy and Safeguards of Nuclear Materials signed, ratified and implemented by Poland**

Annex V **Summary of the new Act of Atomic Law, as amended on 24th of May 2014**

Annex VI **Executive Regulations to the Act of Atomic Law**

Annex VII **Radiation protection rules and dose limits in Poland**

Annex VIII **Overview Matrix**

Annex I. Information on the implementation of the obligations under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive waste Management

Warsaw, July 2024

1. The Polish Nuclear Power Programme (PPEJ).

On January 28th 2014 The Polish Nuclear Power Programme was adopted by the Council of Ministers.

In October 16th 2020 The update of Polish Nuclear Power Programme was adopted by the Council of Ministers.

By the update Poland intends to build by 2045 from 6 to 9 GWe of capacity installed in nuclear power plants. the first reactor should be in operation in 2033.

2. National Plan of Management of Radioactive Waste and Spent Nuclear Fuel.

In 2008 Council of Ministers decided that management of radioactive waste and spent nuclear fuel should come back to the field of responsibility of Minister of Economy, as in his competences lies the responsibility for peaceful using of nuclear energy. The aim of this action is to prepare and implement feasible and socially accepted management of radioactive waste and spend nuclear fuel as one of key components of operation of nuclear power.

The Minister of Economy, by the Regulation of 27 August 2009, established a team responsible for drafting the National Plan of Radioactive Waste and Spent Nuclear Fuel Management (hereinafter referred to as the Plan). The Team composed of representatives of government agencies and institutions responsible for the management of radioactive waste and spent nuclear fuel. The members of the Team were representatives of:

- Nuclear Energy Department in Ministry of Economy,
- Ministry of Environment,
- Ministry of State Treasure,
- National Atomic Energy Agency PAA,
- Radioactive Waste Management Plant ZUOP,
- Institute of Nuclear Chemistry and Technology,
- Internal Security Agency,
- Polish Geological Institute.

Its main task, in addition to defining methods of managing of radioactive waste coming from various types of activities, is to define the method of managing of spent nuclear fuel, as well as guidelines and recommendations for further work in this area (recommendations on the type of fuel cycle, including the possibility of reprocessing in Poland). The Team prepared 12 analyses necessary for the preparation of the draft of the Plan.

Among others things, the team has prepared an evaluation of the real costs of adopting various methods of managing radioactive waste and spent fuel.

These analyses are:

- Expert advice on the Quantity and Cost of Interim and Final Storage of High Radioactive Nuclear Waste and Spent Nuclear Fuel,
- Summary on Treatment, Interim Storage and Final Disposal of Medium and Low Level Radioactive Waste arising from Commercial Reactors in Poland in 21st Century.

The analyses were based on real data and revealed, that the open cycle is less costly. These studies were used as the basis for the recommendations on the approach to spent nuclear fuel.

In 2012, the Minister of Economy adopted guidelines and recommendations for nuclear waste management in Poland, prepared by the Team. The management of radioactive waste and spent nuclear fuel in Poland is based on the following principles:

1. Design, construction, operation and closure are in compliance with the most stringent nuclear safety rules;
2. minimizing the quantity, volume and activity of radioactive waste and filing, eligibility, processing, packaging and appropriate marking of packaged radioactive waste taking into account their content;
3. application of the "polluter pays" principle;
4. use at all stages of radioactive waste and spent nuclear fuel based on evidence and documented decision making process;
5. use an open fuel cycle - until the rise of economic and technical conditions for the introduction of a closed cycle;
6. monitoring of storage and transport of radioactive waste and spent nuclear fuel;
7. a ban on the import of radioactive waste for storage and export, with the exception of exports to the country with which the agreement on the disposal of radioactive waste in radioactive waste repository;
8. the right approach to radiation hazards and emergency response and crisis management - in line with international standards;
9. continuity of personnel training and guarantees its safety in the management of radioactive waste and spent nuclear fuel;
10. developing training and information activities;
11. transparency of activities and public information policy;
12. providing public participation in decision-making;
13. cooperation with international organizations and institutions involved in the management of radioactive waste and spent nuclear fuel;
14. the using of the latest achievements of science and technology in the field of radioactive waste and spent nuclear fuel.

The Team, after considering the costs and benefits of the two possible solutions (reprocessing or not reprocessing the spent nuclear fuel and ultimately, final disposal of all the spent fuel in a deep geological repository on the territory of Poland), recommended the open fuel cycle for Poland. It was much cheaper for countries with nuclear programs such as Poland (construction of two NPPs). This option is also recommended by the IAEA for countries like Poland with embarking nuclear programs.

In May 2014 entered into force amendment to the Atomic Law, which obligates Minister of Economy to prepare the Plan. The Plan was adopted by the Council of Ministers on 16th October 2015 and sent to EC.

The update of national Plan was adopted by Council of Ministers' Resolution No. 154 of 21 October 2020. Update makes the data of activities more realistic and connected with update of Energy Policy up to 2040 and update of Polish Nuclear Power Program.

According to the Act - Atomic Law, the National Plan will be updated every four years, which will allow for verification of data on the financial resources needed for its implementation, as well as for introduction of other necessary changes, including the ones directly relating to management of radioactive waste and spent nuclear fuel.

MoE are preparing the update of National Plan and Polish Nuclear Energy Programme. The most important change will be including to both documents SMR reactors**.**

The period of the validity of the National Plan is determined for the years 2020-2050, with a horizon until the middle of the 22nd century, i.e. to the intended closing of the deep repository of radioactive waste.

The key tasks include:

1. ensuring safe operation of the National Radioactive Waste Repository in Różan till its closing;
2. preparations for closing, final closing and long-term monitoring of the National Radioactive Waste Repository (NRWR) in Różan;
3. selection of a location, construction and commissioning of the new surface radioactive waste repository (NSRWR);
4. preparation for the construction of the deep radioactive waste repository (DRWR) - including implementation of the Polish Underground Research Laboratory (PURL) program;
5. start-up of the DRWR before decommissioning of the first Polish nuclear power plant;
6. modification of rules for radioactive waste management, including radioactive waste originating from nuclear energy industry;
7. modification of the financing system for radioactive waste management, based on the "polluter pays" principle;
8. creation of a development-and-research program concerning management of radioactive waste and spent nuclear fuel;
9. preparation of the personnel for national institutions and economic entities involved in management of radioactive waste and spent fuel and supervision of this management.

Since participation of the society is an equally important issue in management of radioactive waste the actions provided for in the National Plan focus at transparency, dialogue and consultations with representatives of the civil society.

Pursuant to the provisions of the Directive and the Atomic Law Act, Poland is obliged to subject its radioactive waste management system to an international review. At the invitation of the Minister of Energy, experts from the International Atomic Energy Agency (IAEA) reviewed the Polish radioactive waste management system as part of the ARTEMIS mission. The ARTEMIS mission is based on the Agency's safety standards and guidelines as well as good practices from around the world. The mission in Poland was the first one to take place at the request of a European Union member state. Its purpose was to assess the fulfillment of EU requirements for the independent review of the national radioactive waste management system. The ARTEMIS team consisted of 5 experts from Belgium, Finland, France, South Africa and Great Britain and 3 representatives of the IAEA. The team held a series of meetings in Warsaw with representatives of the Ministry of Energy, ZUOP and PAA, and visited facilities in Otwock-Świerk related to the radioactive waste management process. The host of the mission, which was held at the invitation of the Polish government, was the Ministry of Energy. The IAEA mission was in Poland on October 1-10, 2017. The team of experts of the International Atomic Energy Agency (IAEA) stated that Poland has a comprehensive approach to the safe management of radioactive waste and indicated areas for possible improvement in connection with the implementation of the Polish nuclear power program. The mission confirmed that Poland implements most of the elements required in the National Plan for the management of radioactive waste and spent nuclear fuel, in particular with regard to storage. The review highlighted Poland's strengths in waste management and points to areas for further improvement. The ARTEMIS team further concluded that Poland has created a good basis for safe and responsible management of radioactive waste and spent nuclear fuel and underlined the strong commitment of all stakeholders, especially in the context of the planned development of nuclear energy. IAEA representatives praised the government for developing and maintaining a national record of radioactive waste and recognized that interim storage of radioactive waste has been successfully operated for decades.

The final report on the ARTEMIS mission has been published on the IAEA website. The Mission's recommendations were included in the activities envisaged by the update of National Plan.

3. Information about analyses and research of sites for a low- and intermediate-level waste repository and its design and construction.

Poland has only one repository, which is the National Radioactive Waste Repository in Różan and serves for disposal of low- and intermediate- (short-lived) level waste. Its Operator is State owned entity Radioactive Waste Management Plant (ZUOP).

According to the estimates made by the Radioactive Waste Management Plant (ZUOP), the NRWR-Różan is not prepared for radioactive waste coming from for nuclear energy, therefore choice of the site for LLW/ILW-SL waste repository, as well as its design and construction, are one of the most important goals of Polish Nuclear Power Program and National Plan. The update National Plan provides following stages for realization of this task:

1. Finding potential sites Repository,
2. The choice of location Repository,
3. Repository design, obtaining all necessary decisions and permits,
4. Construction,
5. Obtaining necessary license,
6. Operation.

The MoE in cooperation with National Environment Found has prepared a special project. Realisation of it takes about 4-5 years (to the end of 2017) and covers: gathering, analysis, verification and evaluation of available archival materials, as well as conducting additional research being necessary to enable the selection of optimal location of LLW/ILW-SL radioactive waste repository. Works are performed in accordance with the appropriate requirements of the International Atomic Energy Agency in Vienna (IAEA). The results will be used by Government entities and design offices for further work on the site selection for the repository. In 2013 MoE selected the consortium leading by Polish Geological Institute for project realisation. It consists of following phases:

1. Gathering, analysis and evaluation of archival material.
2. Development of geological structure model along with the separation of series of geological and engineering for three selected locations repository.
3. Preliminary Geotechnical characteristics of selected locations based on the repository of archival materials and tests. Development of materials in the form of text and graphics.
4. Development of safety analysis according to the IAEA Requirements "Disposal of Radioactive Waste", Vienna, 2011 as well as corresponding Safety Guides.
5. Evaluation of various locations for radioactive waste repository.
6. Development of rules to implement the monitoring of soil and groundwater in the area of repository.
7. Development a final location for each radioactive waste repository for low and intermediate-level in the form of text and digital information layers.

MoE are provided the research of 4 new potential sites in cooperation with National Environment Found in years 2019-23, but there was no public acceptance.

Because of it, In 2023, the MoE announced the recruitment of municipalities willing to participate in the process of selecting a site for a new surface repository for low- and intermediate-level short-lived radioactive waste. MoE, together with ZUOP, conducts information and educational activities during events with the participation of representatives of local governments.

4. Information about the preparation for closure and the closure of the National Radioactive Waste Repository in Różan.

Poland has only one repository, which is the National Radioactive Waste Repository in Różan and serves for disposal of SL LILW.

The NRWR in Różan will be not finally closed earlier then new NSRWR will be in operation.

Consequently, it is necessary to the preparation of the closure, and then the final closing of NRWR in Różan. The draft Plan provides following stages for realisation of this task:

- Selecting the method of closing NRWR in Różan and execution of safety reports for its continued operation, closure and after closure period,
- Preparation of the concept of closure NRWR in Różan,
- Preparations for the closing, preparation of the repository closure program and obtain a permit to close,
- Discontinue of delivering of radioactive waste,
- Preparation of a report from the closure of the repository, to obtain a decision approving the report of the PAA President,
- Long-term monitoring.

The MoE, in cooperation with National Environment Found, are prepared a special project for providing and financing all analyses which should be make before closure.

5. Information about activities related to the deep geological repository for high-level radioactive waste and spent fuel.

At present, Poland does not face the problem of disposal of spent nuclear fuel. As the only spent nuclear fuel amounts have been arising from the research reactors, in 2009, an agreement was signed with the United States of America and Russian Federation for the permanent removal and shipment of this fuel to Russian Federation in the frames of GTRI - RRRFR Program. However, as it appears from experience of other countries, the necessity to construct such a repository will arise in about 30-40 years from commissioning the first nuclear power plant, i.e. in case of Poland, about 2055-2060 at the earliest. By this time, spent nuclear fuel will be stored onsite the NPP or in interim storage facility located in different place.

It is broadly accepted at the technical level that deep geological disposal represents the safest and most sustainable option to manage high-level waste/spent nuclear fuel in the long term. Site selection for deep geological repository is a vulnerable topic and Ministry in charge of energy prepares to begin this procedure. In the year 2014 begun initiate studies on the possible sites for deep geological disposal.

Selection and evaluation of the location of the deep repository of radioactive waste depends largely on whether the future the site will be linked to the planned Polish Underground Research Laboratory PURL, or is planned to conduct research dedicated directly to the location of the repository, regardless of its work on the PURL. In addition, in the Polish conditions, there are possibilities of adapting existing underground facilities, or parts thereof on the PURL, but this will require appropriate action in this direction. Therefore, the following are three options for implementation of the model for the deep repository, taking into account the previous considerations in Polish conditions, the time frame and selected decision:

- For the localization process of deep repository unrelated PURL, without taking into account the possibility of adapting the existing facilities.

- For the localization process of deep repository unrelated PURL, including the possibility of adapting the existing facilities on the PURL.
- For the localization process of deep repository with accompanying PURL.

The National Plan provides following the nearest stages for realisation of this task:

- Analysis of conditions and the development of the project design,
- Revision of locations based on legal criteria,
- Match promising areas of research.

Poland also decided to participated in international projects connected with final spent nuclear fuel disposal. We participate in the Salt Club, being advisory body of Radioactive Waste Management Committee of NEA. The main tasks of the project are to improve and share experience, knowledge and research in between its Members.

These initiatives, as well as development of bilateral cooperation (for example with Sweden and France) should give us a possibility to find useful knowledge needed for solving the issue of spent nuclear fuel disposal.

In the years 2022-2023, assumptions for the task of the state geological service were developed, the implementation of which will begin in the first quarter of 2024. The task entitled: Analysis of the geological conditions of operating and planned deep geological radioactive waste repositories in Europe and around the world was approved for implementation by the Minister of Climate and Environment and will last until June 30, 2025. The main goal of this task will be to analyze the results of global research and a synthetic review of underground research laboratories working on deep storage of radioactive waste. The prepared report will be a synthesis of world knowledge in the researched field from the point of view of its usefulness in national solutions.

6. Information about public information and activities associated with radioactive waste and spent nuclear fuel.

Public support for the nuclear power is one of the most important preconditions of also for waste management. Experience coming from Western Europe countries and the United States proves that a steady and informed support (or at least acceptance) from the majority of the public is a necessary pre-condition of the implementation of nuclear and waste management. In order to build the public awareness of the nuclear energy option (including waste management) it is necessary to carry out continuous education and information activities.

Based on experiences of other countries, Poland introduced project: Implementing Public Participation Approaches in Radioactive Waste Disposal IPPA. Project was co funded by the European Commission under the Seventh EURATOM Framework Programme for Nuclear Research and Training Activities (2007-2013). The principal objective of the IPPA Project was to increase awareness of all aspects concerning the choice of a suitable site for a new repository for low- and intermediate-level radioactive waste in order to improve the conditions for transparency and active involvement of the general public into the decision-making process. This is to be seen within the context of the plans to introduce nuclear power in Poland, this possibly making the low- and intermediate-level radioactive waste repository part of a larger radioactive waste management system including the possibility of deep disposal of high-level waste and spent nuclear fuel in future. Poland is now engaged in process of preparation of new project, which allow us to use experience from IPPA project.

Poland also printed and distributed Small Nuclear Energy Encyclopedia, which should help to understand all aspects related to radioactive waste management.

Starting from 2022, MoE organized an information and education campaign. Activities undertaken within the frames of campaign were provided on two levels:

1. national
2. local – at possible and approved locations of nuclear power facilities and repositories.

Its purpose is to raise the level of knowledge about nuclear power among the public to ensure that decisions expressed about nuclear power – whether positive or negative – are based on relevant information rather than on myths and false beliefs, and that they are immune to populist, ideological or irrational arguments.

The campaign carried out educational activities with the use of all available forms of communication (Internet, television, radio, daily press, magazines and industry journals). Information and education activities will be continued up to 2033.

Also thanks to educational and information activities, the level of public support for the development of nuclear energy is high.

7. Information on planned activities or official findings on the shipment of spent LEU-type nuclear fuel EK-10, derived from the research reactor EWA, to Russian Federation.

In 2009, in the frames of GTRI-RRRFR Program, an agreement was signed with the United States of America and the Russian Federation for the permanent removal and shipment of HEU-type spent nuclear fuel from the research reactors to Russian Federation. Due to the analyses both sides agree that in case of Poland, the Agreement with the Russian Federation gives possibility to ship to Russian Federation also the low enriched spent fuel EK-10. In September 2011 Poland, Russian Federation and the USA agreed for :

1. transport of EK-10 took place in 2012,
2. cost of transportation was covered by the USA,
3. to the end of 2011 Poland and Russian Federation agreed upon the financial conditions of the contract.

Transport was sent in 2012 and to the end of 2013 Poland was paid for it.

8. Information on the proposed arrangements on the responsibility for providing funds for dealings with radioactive waste, spent nuclear fuel and decommissioning of nuclear facilities.

In Poland currently Atomic Law introduces financial solutions in waste management. The costs of the proceedings and the management of radioactive waste and spent nuclear fuel from its production in nuclear power plants until their transfer to the final procedure to ZUOP, will be funded from current organizational entity that has received authorization to operate a nuclear power plant.

In the current legal status of the final financing management of radioactive waste and spent nuclear fuel derived from nuclear power will be realized from the liquidation of the fund, established by the organization, which receives authorization to operate a nuclear power plant.

Decommissioning fund will be ring-fenced fund special assigned to it a separate bank account from which the funds collected will be allowed only be invested in term deposits or intended to acquire for no long-term bonds issued by the Minister of Finance.

Decommissioning Fund will be powered by quarterly payments made by the entity, which appointed him. The amount of payments will depend on the amount produced in the amount of megawatt nuclear electricity.

In terms of finance management of radioactive waste and spent nuclear fuel is expected to introduce the following solution - breakdown the money from existing Decommissioning fund in two parts:

- Establishment of the National Fund. The Fund will be governed by Governmental institution and will be responsible for collecting spent nuclear fuel and other waste supplied by the operator/operators of Nuclear Energy Facility. In addition, contributions to the Fund will be made by others outside the nuclear storage sites.
- Establishment of new Decommissioning Funds of Nuclear Energy Power Plants, which will cover the expenses necessary to decommission the NPP. The NPP operator will be required to establish and maintain (manage) the Decommissioning Fund for the NPP. The funds accumulated in Decommissioning Fund of NPP will come from annual contributions to the fund made by the NPP`s operator and the proceeds arising from fair investment fund law. The funds collected for the Decommissioning Fund of NPP will be excluded from the bankruptcy of the operator. These measures will be exempt from execution.

The update of National Plan provides following stages for realisation of this task:

- Develop a detailed concept for financing the management of radioactive waste in Poland, including coming from nuclear power,
- The necessary changes to the legal system.

Annex II. Activity and Activity`s Concentration being base of radioactive waste classification

Isotope	Activity [Bq]	Activity concentrations [kBq/kg]
1	2	3
H-3	10^9	10^6
Be-7	10^7	10^3
C-14	10^7	10^4
O-15	10^9	10^2
F-18	10^6	10
Na-22	10^6	10
Na-24	10^5	10
Si-31	10^6	10^3
P-32	10^5	10^3
P-33	10^8	10^5
S-35	10^8	10^5
Cl-36	10^6	10^4
Cl-38	10^5	10
Ar-37	10^8	10^6
Ar-41	10^9	10^2
K-40	10^6	10^2
K-42	10^6	10^2
K-43	10^6	10
Ca-45	10^7	10^4
Ca-47	10^6	10
Sc-46	10^6	10
Sc-47	10^6	10^2
Sc-48	10^5	10
V-48	10^5	10
Cr-51	10^7	10
Mn-51	10^5	10
Mn-52	10^5	10
Mn-52m	10^5	10
Mn-53	10^9	10^4
Mn-54	10^6	10
Mn-56	10^5	10
Fe-52	10^6	10
Fe-55	10^6	10^4
Fe-59	10^6	10
Co-55	10^6	10
Co-56	10^5	10
Co-57	10^6	10^2
Co-58	10^6	10
Co-58m	10^7	10^4
Co-60	10^5	10
Co-60m	10^6	10^3
Co-61	10^6	10^2
Co-62m	10^5	10
Ni-59	10^8	10^4
Ni-63	10^8	10^5
Ni-65	10^6	10

1	2	3
Cu-64	10^6	10^2
Zn-65	10^6	10
Zn-69	10^6	10^4
Zn-69m	10^6	10^2
Ga-72	10^5	10
Ge-71	10^8	10^4
As-73	10^7	10^3
As-74	10^6	10
As-76	10^5	10^2
As-77	10^6	10^3
Se-75	10^6	10^2
Br-82	10^6	10
Kr-74	10^9	10^2
Kr-76	10^9	10^2
Kr-77	10^9	10^2
Kr-79	10^5	10^3
Kr-81	10^7	10^4
Kr-83m	10^{12}	10^5
Kr-85	10^4	10^5
Kr-85m	10^{10}	10^3
Kr-87	10^9	10^2
Kr-88	10^9	10^2
Rb-86	10^5	10^2
Sr-85	10^6	10^2
Sr-85m	10^7	10^2
Sr-87m	10^6	10^2
Sr-89	10^6	10^3
Sr-90+	10^4	10^2
Sr-91	10^5	10
Sr-92	10^6	10
Y-90	10^5	10^3
Y-91	10^6	10^3
Y-91m	10^6	10^2
Y-92	10^5	10^2
Y-93	10^5	10^2
Zr-93+	10^7	10^3
Zr-95	10^6	10
Zr-97+	10^5	10
Nb-93m	10^7	10^4
Nb-94	10^6	10
Nb-95	10^6	10
Nb-97	10^6	10
Nb-98	10^5	10
Mo-90	10^6	10
Mo-93	10^8	10^3

Isotope	Activity [Bq]	Activity concentration [kBq/kg]
1	2	3
Mo-99	10^{6}	10^{2}
Mo-101	10^{6}	10
Tc-96	10^{6}	10
Tc-96m	10^{7}	10^{4}
Tc-97	10^{8}	10^{4}
Tc-97m	10^{7}	10^{4}
Tc-99	10^{7}	10^{5}
Tc-99m	10^{7}	10^{4}
Ru-97	10^{7}	10^{4}
Ru-103	10^{6}	10^{4}
Ru-105	10^{6}	10
Ru-106+	10^{5}	10^{4}
Rh-103m	10^{8}	10^{5}
Rh-105	10^{7}	10^{4}
Pd-103	10^{8}	10^{3}
Pd-109	10^{6}	10^{3}
Ag-105	10^{6}	10^{4}
Ag-108m+	10^{6}	10
Ag-110m	10^{6}	10
Ag-111	10^{6}	10^{3}
Cd-109	10^{8}	10^{5}
Cd-115	10^{6}	10^{4}
Cd-115m	10^{6}	10^{3}
In-111	10^{6}	10^{4}
In-113m	10^{6}	10^{4}
In-114m	10^{6}	10^{4}
In-115m	10^{6}	10^{4}
Sn-113	10^{7}	10^{3}
Sn-125	10^{5}	10^{4}
Sb-122	10^{5}	10^{4}
Sb-124	10^{6}	10
Sb-125	10^{6}	10^{4}
Te-123m	10^{7}	10^{4}
Te-125m	10^{7}	10^{4}
Te-127	10^{6}	10^{3}
Te-127m	10^{7}	10^{3}
Te-129	10^{6}	10^{4}
Te-129m	10^{6}	10^{3}
Te-131	10^{5}	10^{4}
Te-131m	10^{6}	10
Te-132	10^{7}	10^{4}
Te-133	10^{5}	10
Te-133m	10^{5}	10
Te-134	10^{6}	10
I-123	10^{7}	10^{4}
I-125	10^{6}	10^{3}
I-126	10^{6}	10^{4}
I-129	10^{5}	10^{4}
I-130	10^{6}	10
I-131	10^{6}	10^{4}
I-132	10^{5}	10
I-133	10^{6}	10
I-134	10^{5}	10
I-135	10^{6}	10
Xe-131m	10^{4}	10^{4}
Xe-133	10^{4}	10^{3}
Xe-135	10^{10}	10^{3}
Cs-129	10^{5}	10^{4}
Cs-131	10^{6}	10^{3}
Cs-132	10^{5}	10
Cs-134m	10^{5}	10^{3}
Cs-134	10^{4}	10
Cs-135	10^{7}	10^{4}
Cs-136	10^{5}	10
Cs-137+	10^{4}	10
Cs-138	10^{4}	10
Ba-131	10^{6}	10^{3}
Ba-140+	10^{5}	10
La-140	10^{5}	10
Ce-139	10^{6}	10^{4}
Ce-141	10^{7}	10^{4}
Ce-143	10^{6}	10^{4}
Ce-144+	10^{5}	10^{4}
Pr-142	10^{5}	10^{4}
Pr-143	10^{6}	10^{5}
Nd-147	10^{6}	10^{4}
Nd-149	10^{6}	10^{4}
Pm-147	10^{7}	10^{5}
Pm-149	10^{6}	10^{3}
Sm-151	10^{6}	10^{5}
Sm-153	10^{6}	10^{4}
Eu-152	10^{6}	10
Eu-152m	10^{6}	10^{4}
Eu-154	10^{6}	10
Eu-155	10^{7}	10^{4}
Gd-153	10^{7}	10^{4}
Gd-159	10^{6}	10^{3}
Tb-160	10^{6}	10
Dy-165	10^{6}	10^{3}
Dy-166	10^{6}	10^{3}
Ho-166	10^{5}	10^{3}
Er-169	10^{7}	10^{4}
Er-171	10^{6}	10^{4}
Tm-170	10^{6}	10^{3}
Tm-171	10^{8}	10^{4}
Yb-175	10^{7}	10^{3}
Lu-177	10^{7}	10^{3}
Hf-181	10^{6}	10
Ta-182	10^{4}	10
W-181	10^{7}	10^{3}
W-185	10^{7}	10^{4}
W-187	10^{6}	10^{4}
Re-186	10^{6}	10^{3}
Re-188	10^{5}	10^{4}
Os-191m	10^{7}	10^{3}
Os-193	10^{6}	10^{4}
Ir-190	10^{6}	10
Ir-192	10^{4}	10

Isotope	Activity [Bq]	Activity concentration [kBq/kg]
1	2	3
Ir-194	10^{7}	10^{4}
Pt-191	10^{6}	10^{4}
Pt-193m	10^{7}	10^{4}
Pt-197	10^{6}	10^{4}
Pt-197m	10^{6}	10^{4}
Au-198	10^{6}	10^{4}
Au-199	10^{6}	10^{4}
Hg-197	10^{7}	10^{4}
Hg-197m	10^{6}	10^{4}
Hg-203	10^{5}	10^{4}
Tl-200	10^{6}	10
Tl-201	10^{6}	10^{4}
Tl-202	10^{6}	10^{4}
Tl-204	10^{4}	10^{4}
Pb-203	10^{6}	10^{4}
Pb-210+	10^{4}	10
Pb-212+	10^{5}	10
Bi-206	10^{5}	10
Bi-207	10^{6}	10
Bi-210	10^{6}	10^{3}
Bi-212+	10^{5}	10
Po-203	10^{6}	10
Po-205	10^{6}	10
Po-207	10^{6}	10
Po-210	10^{4}	10
At-211	10^{7}	10^{3}
Rn-220+	10^{7}	10^{4}
Rn-222+	10^{6}	10
Ra-223+	10^{5}	10^{4}
Ra-224+	10^{5}	10
Ra-225	10^{5}	10^{4}
Ra-226+	10^{4}	10
Ra-227	10^{6}	10^{4}
Ra-228+	10^{5}	10
Ac-228	10^{6}	10
Th-226+	10^{7}	10^{3}
Th-227	10^{4}	10
Th-228+	10^{4}	1
Th-229+	10^{3}	1
Th-230	10^{4}	1
Th-231	10^{7}	10^{3}
Th-232nat	10^{3}	1
Th-234+	10^{5}	10^{3}
Pa-230	10^{6}	10
Pa-231	10^{3}	1
Pa-233	10^{7}	10^{4}
U-230+	10^{5}	10
U-231	10^{7}	10^{4}
U-232+	10^{3}	1
U-233	10^{4}	10
U-234	10^{4}	10
U-235+	10^{4}	10

1	2	3
U-236	10^{4}	10
U-237	10^{6}	10^{4}
U-238+	10^{4}	10
U-238nat	10^{3}	1
U-239	10^{6}	10^{4}
U-240	10^{7}	10^{4}
U-240+	10^{6}	10
Np-237+	10^{3}	1
Np-239	10^{7}	10^{4}
Np-240	10^{6}	10
Pu-234	10^{7}	10^{4}
Pu-235	10^{7}	10^{4}
Pu-236	10^{4}	10
Pu-237	10^{7}	1
Pu-238	10^{4}	1
Pu-239	10^{4}	1
Pu-240	10^{3}	1
Pu-241	10^{5}	10^{4}
Pu-242	10^{4}	1
Pu-243	10^{7}	10^{3}
Pu-244	10^{4}	1
Am-241	10^{4}	1
Am-242	10^{6}	10^{3}
Am-242m+	10^{4}	1
Am-243+	10^{3}	1
Cm-242	10^{5}	10^{4}
Cm-243	10^{4}	1
Cm-244	10^{4}	10
Cm-245	10^{3}	1
Cm-246	10^{3}	1
Cm-247	10^{4}	1
Cm-248	10^{3}	1
Bk-249	10^{6}	10^{3}
Cf-246	10^{6}	10^{3}
Cf-248	10^{4}	10
Cf-249	10^{3}	1
Cf-250	10^{4}	10
Cf-251	10^{3}	1
Cf-252	10^{4}	10
Cf-253	10^{5}	10^{4}
Cf-254	10^{3}	1
Es-253	10^{5}	10^{4}
Es-254	10^{4}	10
Es-254m	10^{6}	10^{4}
Fm-254	10^{7}	10^{4}
Fm-255	10^{6}	10^{3}

Annex III. Activity of Isotopes in the waste stored/disposed at NRWR-Różan in years 1961-31.12.2023

Isotope	Activity on 31.12.2023 [GBq]	Initial activity [GBq]
Cs-137	18 018,6	35 735,9
Sr-90	5 967,9	8 695,2
Am-241	4 761,5	4 930,2
H-3	4 658,6	11 004,0
Pu-239	4 455,5	4 459,1
Co-60	1 829,2	62 037,9
U-238	1 262,2	1 262,2
Pu-238	812,5	978,5
Ra-226	721,6	731,9
C-14	539,1	541,3
Kr-85	386,5	1 222,3
U-236	153,5	153,5
Ni-63	65,5	76,6
Th-232	28,6	28,6
Cm-244	26,6	47,5
Eu-152	25,9	215,8
Th-230	13,6	13,6
Pm-147	9,5	269,7
Eu-154	7,9	208,6
K-40	7,6	7,6
Cl-36	5,7	5,7
Pb-210	2,8	17,2
Pm-145	1,6	5,0
U-235	1,4	1,4
Fe-55	1,0	31,6
S-35	0,9	16 459,6
Ba-133	0,8	1,9
Se-75	0,7	118 889,1
Tl-204	0,6	319,9
Cs-134	0,5	240,9
Sb-125	0,4	22,3
Ge-68	0,1	8,7
Ir-192	0,1	346 381,8
Na-22	0,0	2,5
Te-127m	0,0	295,9
Te-121m	0,0	172,0
Cf-252	0,0	4,6
Zn-65	0,0	1 900,7
Te-123m	0,0	652,1
Ca-45	0,0	31,2
Co-57	0,0	14,0
Ru-106	0,0	153,5
Mn-54	0,0	65,0
Ag-110m	0,0	1,0
Cd-109	0,0	6,1

Ce-144	0,0	1 597,2
Sr-89	0,0	56,1
Cr-51	0,0	1 753,9
Gd-153	0,0	1,3
P-32	0,0	2 529,7
Te-127	0,0	295,7
Sn-113	0,0	49,5
Mo-99	0,0	163,9
W-188	0,0	7,2
Lu-177	0,0	278,8
I-123	0,0	11,2
Co-58	0,0	10,0
Fe-59	0,0	145,8
Rb-86	0,0	5,8
Ce-141	0,0	323,8
Na-24	0,0	275,1
Ba-140	0,0	1,9
La-140	0,0	1,6
Lu-166	0,0	1,5
Yb-169	0,0	2 160,6
Y-90	0,0	616,6
Sb-124	0,0	68,6
Cu-64	0,0	6,0
La-142	0,0	3,2
Hg-203	0,0	1,1
Kr-88	0,0	1,9
Re-188	0,0	6,3
I-125	0,0	27 042,8
Po-210	0,0	5 893,1
Ir-190	0,0	5,6
Nb-95	0,0	343,6
Ag-110	0,0	20,4
Cm-242	0,0	111,0
Lu-172	0,0	18,0
I-131	0,0	352,0
Te-121	0,0	158,1
Sc-46	0,0	15,2
Tm-170	0,0	129,2
Zn-69	0,0	262,9
Sr-85	0,0	2,1
Sb-122	0,0	3,3
Ta-182	0,0	1,0
Hf-181	0,0	5,3
Tc-99m	0,0	214,6
Ru-103	0,0	24,9
Zr-95	0,0	185,2
Kr-90	0,0	1,9
others	1,3	10,5
Total	**43 769,7**	**663 478,9**

Annex IV. International Conventions related to safe utilization to Atomic Energy and Safeguards of Nuclear Materials signed, ratified and implemented by Poland

(1) Convention ILO 115 on Workers Protection against Ionising Radiation, *ratified on 23 December 1964*;

As a result the international safety standards for radiation protection and their amended versions were being implemented in Poland, pursuant to subsequent ICRP recommendations; the present legislation is based on the 1994 Basic Safety Standards (BSS) as edited by the IAEA. The recent revision of the BSS has been used for harmonising existing regulations with the directive 96/29 EURATOM.

(2) Treaty on the Non-Proliferation of Nuclear Weapons, *ratified on 12 June 1969*;

Since 1st of March 2007 Poland is a Member State of trilateral safeguard agreement INFCIRC/193. Poland is also a Member country of the Nuclear Suppliers Group, so that the NSG guidelines published by the IAEA as INFCIRC 254/rev 3/Part 1 and Part 2 are observed: the control of the export and import is exercised by the State system of control of foreign trade in materials and technologies as set by the Law of November 29, 2000 on Foreign Trade in Goods, Technologies and Services Strategically Important for the Security of State and for preserving International Peace and Security. The above mentioned Law is accompanied by a set of regulations issued by the Minister of Economy. The National Atomic Energy Agency (PAA) provides expertise and opinions in the field of nuclear technologies; licenses are being issued by the Ministry of Economy after considering opinions from relevant ministries and agencies. Poland ratified (on 5.05.2000) the Additional Protocol to its Safeguards Agreement with the International Atomic Energy Agency and has implemented procedures of the Protocol; the Protocol replaced, i.a. the earlier voluntary offer to the IAEA concerning extended reporting on nuclear materials and equipment transfers pursuant the IAEA document GOV/2629. Poland has adequate legislation and procedures for accountancy of nuclear materials for the purpose of Safeguards.

(3) Convention on the Physical Protection of Nuclear Material, *ratified on 5 October 1983;*

There are legal provisions to enforce compliance with the convention requirements (Regulation of the Council of Ministers on 4.11.2008, pursuant to art.42 of the Atomic Law Act). Poland signed new version of the Convention with amendments agreed in July 2005.

(4) Convention on Early Notification of a Nuclear Accident*, ratified 24 March 1988;*

Poland has signed bilateral agreements on early notification of a nuclear accident and on cooperation in nuclear safety and radiological protection with Denmark (1987), Norway (1989), Austria (1989), Ukraine (1993), Belarus (1994), Russian Federation (1995), Lithuania (1995), Slovak Republic (1996), Czech Republic (2005) and **Germany (2009)**; The International Warning Point of the early warning system (IWP) as well as Radiation

Emergency Centre (“CEZAR”) with International Contact Point has been established within the PAA organisation. The IWP works on a 24 hours a day basis. It serves as a channel of exchanging information on radiation emergencies with IAEA in Vienna and neighbouring

countries according to international conventions and bilateral agreements. Since 22 April 2004 official ECURIE station has been operating in CEZAR .

(5) Convention on Assistance in Case of a Nuclear Accident on Radiological Emergency, *ratified on 24 April1988*;

Currently there are no special arrangements on assistance management specifically during a large scale nuclear accident; however Poland has more generic bilateral agreements with neighbouring Countries for the purpose of reception of incoming international rescue teams and for the border entry control in the case of any kind of large scale emergency. Also, the Nation-wide Emergency Preparedness Plan, covering the trans-border and national radiation emergencies, and related regional and local plans are implemented.

(6) Vienna Convention on Civil Liability for Nuclear Damage, acceded to in 1990, the Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention, and the Protocol to Amend the Vienna Convention, signed in 1999.

There are legal provisions to enforce compliance with the convention requirements – Chapter 12 of the Act of Atomic Law and Regulation of the Minister of Finance issued on 14.09.2011 pursuant to art. 103.4 of the Act

(7) Joint Convention on the Safety of Spent Fuel Management and on the Safety of the Radioactive Waste Management, *ratified on 18 June2001*;

Compliance with this Convention reported under the 1st,the 2nd, the 3rd, the 4th, the 5threview process and the First the Second, Third, Fourth and Fifth Review Meeting of Contracting Parties.

(8) Arrangement between the President of the National Atomic Energy Agency of the Republic of Poland and the Nuclear Regulatory Commission of the United States of America for the exchange of technical information and cooperation in nuclear safety matters, *signed in 2016*

Annex V. Summary of the Atomic Law Act

The Atomic Law Act, originally enacted by the Parliament of the Republic of Poland on 29th November 2000, has been amended several times in the years 2001-2019. Significant amendment was published in Official Journal on 23th August 2019 (item 1593) and entered into force on 23rd September 2019.

The Act is divided into 20 Chapters:

Chapter 1, entitled *"General provisions"*, defines the subject and presents definitions of terms used in the text of the Law.

Chapter 2, entitled *"Licenses addressing nuclear safety and radiological protection issues"*, lists the activities which require licenses, registration or notifications from the point of view of nuclear safety or radiological protection, and activities which are prohibited. It also sets up adequate procedures regarding the licensing and defines the authorities granting licenses to perform activities.

Chapter 3, entitled *"Nuclear safety, radiological protection and health protection of workers"*, places the responsibility for nuclear safety and radiological protection on the head of the organizational entity pursuing the activities involving exposure and defines the scope of this responsibility, in particular in a case of ceasing activity. It formulates the requirement for justification of such activities, as well as a number of other requirements, such as supervision and inspection, the imperative to follow the "optimization principle" with regard to exposures, adequate training of workers, radiological safety of individuals in cases of medical exposures, occupational exposures and radiological protection of workers and external workers, and their rights. This chapter also specifies the conditions for carrying out actions aimed at elimination of radiation emergency consequences, maintaining of the central register of doses received by category A workers, categorization of radiation workers (categories A and B) and requirements with regard to dosimetric equipment. Finally, it introduces provisions regarding exposure to indoor radon and a system of subsidizing certain activities in the area of nuclear and radiological safety from the State budget.

Chapter 3a, entitled *"Medical application of ionizing radiation"*, enumerates medical applications of ionizing radiation, and formulates principles of carrying on activities that involve patient's exposure to ionizing radiation, in particular – mandatory justification of exposure and optimization of radiological protection. It places responsibilities for patient's exposures on the authorized medical practitioner, and relevant responsibilities and duties in the area of inspection and clinical audits - on medical institutions. It defines principles and requirements for quality management system in radio-diagnostics, invasive radiology, nuclear medicine and radiotherapy, including the reference radiological procedures for standard medical exposures, the terms of issuance of relevant permits and authorizations and the authorities competent for granting them. Finally, it formulates the scope and terms of creation of the National Radiation Protection Center in Medicine and the central data base for medical radiation facilities.

Chapter 4, entitled *"Nuclear facilities"*, has been thoroughly revised during amendment in 2011. In its current version chapter gives most essential safety requirements for nuclear facilities, and especially nuclear power plants. Primary responsibility for nuclear safety and radiation protection is placed on the head of organizational entity possessing license, provisions referring to public access to information on nuclear safety of nuclear facilities and public involvement in licensing process. Several safety requirements based on recommendations of IAEA, WENRA, ENSREG and other international organizations were added making it clear that only modern and safe technologies can be used during siting,

design, construction, commissioning, operation and decommissioning of nuclear facilities. The license can be given to applicant who has sufficient funding to finish the construction and cover the costs of safe operation. Also new mechanisms for regulatory supervision were added (e.g. Periodical Safety Reviews). Recent amendment of the Atomic Law act introduced requirement which states that in the process of siting, design, construction, commissioning, operation including repairs, modifications and modernization of a nuclear installation, as well as in the process of its decommissioning, technical and organizational solutions should be applied aimed at preventing accidents, and if accidents occur – limiting their effects and avoiding:

a) early releases of radioactive substances requiring off-site intervention measures, for which there would be insufficient time to carry out,

b) large releases of radioactive substances requiring off-site intervention measures, for which implementation could not be limited in area and time.

Chapter 4a, entitled *"Public information in terms of nuclear facilities"*, formulates requirements for operator to create the Local Information Centre and determines its tasks. It defines also other methods of information of local community, which is a local information committee or municipal information point.

Chapter 4b, entitled *"Strategy and policy in the development of nuclear safety and radiation protection"*, provides legal basis for development of the strategy and policy in the development of nuclear safety and radiation protection of the Republic of Poland. The nuclear safety and radiation protection strategy shall determine in particular the purposes of the nuclear safety and radiation protection strategy, the description of the legal framework for nuclear safety and radiation protection, description of the current state of nuclear safety and radiation protection, principles of nuclear safety and radiation protection and directions of actions aimed to develop nuclear safety and radiation protection. The nuclear safety and radiation protection strategy shall be approved by means of a resolution by the Council of Ministers, on request of the minister competent in Climate matters. The first strategy was adopted by the Council of Ministers on 12th April 2022.

Chapter 5, entitled *"Nuclear materials and technologies"*, formulates requirements for adequate nuclear materials accountancy and their physical protection as well as for appropriate control of nuclear technologies (as required by appropriate international agreements and conventions). In particular, it includes a prohibition of the use these materials and technologies to construct nuclear weapon or nuclear explosives; any scientific research in this area is subject to notification to the PAA President prior to their commencement. It defines also other PAA President's duties and responsibilities in this area as well as the obligations of the head of the organizational entity performing activities with nuclear materials and of other users of lend or buildings where such an activities could be possible, in connection with safeguards inspections performed by PAA, IAEA or EURATOM inspectors. Recent amendment of the Atomic Law Act provided for new requirements on Design Basis Threat development.

Chapter 6, entitled *"Ionizing radiation sources"*, formulates requirements for the accountancy, and inspection with regard to radioactive sources and to equipment containing such sources or generating ionizing radiation. It includes also requirement of appropriate protection of radioactive sources against damage, theft or possessing by an unauthorized person.

Chapter 7, entitled *"Radioactive waste and spent nuclear fuel"*, classifies radioactive waste, states the responsibilities of the head of the organizational entity which is handling waste, and addresses the questions of waste disposal including provisions on siting of waste repositories and of the necessary protection of humans and of the environment. The

amended Atomic Law introduced provisions that the organizational unit which has generated the radioactive waste or the spent nuclear fuel is held responsible for ensuring that it is possible to manage the radioactive waste and the spent nuclear fuel from the moment of their generation until their disposal at the repository, including for financing of this procedure and coverage of the related disposal costs, altered the principles of classification, storage, disposal and keeping records of radioactive waste and spent nuclear fuel. With regard to the classification of radioactive waste, the notion of activity level or dose rate on the surface of waste material has been replaced by a criterion of radioactive concentration of radioisotopes the former contain. It also regulates responsibilities of MoE in preparing the National Plan of Radioactive Waste and Spent Nuclear Fuel Management.

Chapter 8, entitled *"Transport of nuclear materials, ionizing radiation sources, radioactive wastes and spent nuclear fuel"*, formulates requirements for safe transporting of such materials and regulates the questions of their import, export and transit through the Polish territory, as well as on reporting of these activities to the PAA President.

Chapter 8a, entitled *"Import, export and transit through the territory of Republic of Poland of radioactive waste and spent nuclear fuel"*, establishes formal and organizational conditions connected with the procedure of licensing the above mentioned activities.

Chapter 9, entitled *"Supervision and inspection from the viewpoint of nuclear safety and radiological protection conditions"*, allocates the control and inspection responsibilities to appropriate bodies, formulates these responsibilities as well as the rights of the regulatory body authority, introduces enforcement measures, and sets up qualification requirements with regard to nuclear regulatory inspectors. It introduces types of inspection (e.g. "continuous inspections" to be performed by resident inspectors at nuclear power plants) and so called "Coordination System" which is mechanism of cooperation of different governmental control institutions (Office of Technical Inspection, Chief Environmental Protection Inspector, Chief Sanitary Inspector, Chief Commanding Officer of the State Fire Service, General Inspector of Office of Building Control, Chief Labor Inspector, Head of the Internal Security Agency) involved in supervision of nuclear facilities. Cooperation will include exchange of information, joint inspection and trainings etc.

Chapter 10, entitled *"National radiation situation assessment"*, obliges the PAA President to conduct systematic assessments of the national radiation situation and formulates requirements thereof, including the use for these purposes of a dedicated Radiation Emergency Center established within the PAA and receiving appropriate data from "stations" and "units" serving for early detection of radioactive contamination (the list of such "stations" and "units" has been established by means of the Governmental regulation) and operates the International Contact Point for early warning and information exchange with IAEA, EU and other Countries in a case of radiation emergency. It also obliges the PAA President to provide information to the general public, regional governors, Council of Ministers and/or to the chairman of the appropriate crisis management team at the national level.

Chapter 11, entitled *"Radiation emergency management",* introduces the distinction between different types of radiation emergencies and list the actions to be undertaken in case of such emergencies, as well as formulates the responsibilities on all levels. It refers to the national emergency preparedness plan established through a Governmental regulation and sets up rules for the implementation of specific intervention measures (including the issue of costs to be borne in such cases). It also formulates a requirement to conduct periodic exercises to test the national emergency preparedness plan and addresses the questions of protection against the use of food and feeding stuffs that exceed the permitted levels of radioactive substances contents, both produced within the Polish territory or imported. Recent amendment of the Atomic Law Act imposes an obligation on the head of the organizational unit, voivode (regional governor in Poland) and minister competent for internal affairs to

develop a management system for situations of radiation emergency. A solution was proposed where hazard analysis based on hazard categorization and criteria for hazard analysis is performed first, then conclusions from this hazard analysis are taken into account when developing an appropriate emergency plan, and the emergency response plan and hazard analysis are the elements which are part of the radiation emergency management system.

Chapter 12, entitled *"Civil liability for nuclear damage"*, allocates the responsibility for nuclear damage caused to individuals, property and environment to the operator and limits its liability to 300 million SDR, allows the operator to establish a limited liability fund in a case when claims exceed this figure, obliges the operator to be insured, sets procedures for claiming the compensation, sets time limits for suing for the damage, and locates the competence in the issues of nuclear damage.
Since 1st July 2011 the civil liability limit of the operator is raised from 150 million SDR to 300 million SDR. Subsequently, the amount of minimal financial security required from the operator is set now at the level of 300 million SDR, with the exception for research reactors, for which minimal financial security required from the operator is set at the level from 400 000 SDR to 5 million SDR. There is also introduced a new obligation for the operator to have a separate financial security for transportation of any nuclear material from a nuclear facility.

Chapter 12a, entitled *„Activities in terms of nuclear energy development",* describes the activities of the Minister competent for energy matters in the field of the use of atomic energy for the social and economic needs of the state, especially aimed at the development of nuclear power programme. In particular, this chapter contains provisions for developing, approving and updating a long-term programme called "the Polish Nuclear Power Programme".

Chapter 13, entitled *"The President of the National Atomic Energy Agency"*, states that the President of the PAA is the central organ of the governmental organization and is nominated by the Prime Minister to whom he reports directly, on request by the Minister competent for Climate matters, who supervises PAA administratively. The President executes his tasks (which are listed in Art. 110 of the Atomic Law) through the National Atomic Energy Agency, the statute of which is to be issued by the Minister competent for Climate matters. In addition, this chapter introduces a PAA President's consulting and opinion-giving body, the Council for Nuclear Safety and Radiation protection, which is appointed by the Minister competent for Climate matters upon the opinion of the President of the PAA. New Council is composed of a smaller number of members (not more than 10) and has a narrower and better defined responsibilities involving reviewing of draft licenses, legal acts and regulatory guides and formulating opinions and assessments on request of PAA President. The Council is elected for the 4 years term.

Chapter 14, entitled *"State-owned public utility "Radioactive Waste Management Plant",* establishes the above named plant as a legal personality while the supervision over the plant is placed under responsibilities of the minister competent for energy matters, who provides the plant with a statute. This chapter specifies, inter alia, that the utility receives a subsidy from the national budget for radioactive waste and spent fuel management.

Chapter 15, entitled *"Penal regulations"*, introduces financial penalty or other means of punishment for cases of violations of rules established by this Law. Last amendment introduced higher monetary fines which can be imposed upon NPP operating organization.

Chapter 16, entitled *"Transitional, adaptive and final provisions"*, formulates detailed conditions for the enactment of this Law.

Annex VI. Executive Regulations to the Act of Atomic Law

Regulations by the Prime Minister and the Council of Ministers

2002

- Council of Ministers regulation on stations for early detection of radioactive contamination and units performing radioactive contamination measurements, issued on 17.12.2002, OJ (Dz. U. 2002), No. 239, item 2030, in force since 01.01.2003;
- Council of Ministers regulation on requirements for dosimetric equipment, used in normal circumstances and in emergencies, issued on 23.12.2002, OJ (Dz. U. 2002), No. 239, item 2032, in force since 01.01.2003.

2004

- Council of Ministers regulation on the values of intervention levels for particular types of intervention activities and levels for their cancellation, issued 27.04.2004 OJ (Dz. U. 2004) no 98 item 987, in force since 01.05.2004;
- Council of Ministers regulation on the Bodies relevant to control of foodstuff and feeding-stuff after a radiation emergency on conformance with the prescribed contamination limits, issued 27.04.2004 OJ (Dz. U. 2004) No. 98 item 988, in force since 01.05.2004;
- Council of Ministers regulation on preliminary information to the general public on health protection measures to be implemented in a case of radiation emergency, issued 27.04.2004 - OJ (Dz. U. 2004) No. 102 item 1065, in force since 01.05.2004.

2006

- Council of Ministers regulation on detailed conditions for safe handling of radiation sources, issued on 12.07.2006, OJ (Dz. U. 2022), item 967, in force since 21.08.2006;

2007

- Council of Ministers regulation on the requirements for controlled and supervised areas, issued on 20.02.2007. OJ (Dz. U. 2022), item 722, in force since 07.08.2007.

2008

- Council of Ministers regulation on the issuing of the permits for the import to, export from, and transit through the territory of Poland of spent nuclear fuel, issued 21.10.2008, OJ (Dz. U. 2008) No. 219, item 1402, in force since 25.12.2008;
- Council of Ministers regulation on security of nuclear materials and nuclear facilities, issued on 4.11.2008, OJ (Dz. U. 2008) No. 207, item 1295, in force since 25.12.2008.

2011

- Council of Ministers regulation on standard quarterly report on the amount of contributions to the decommissioning fund, issued on 27.12.2011, OJ (Dz. U. 2021) item 393, in force since 28.01.2012;

- Council of Ministers regulation on periodical safety assessment of a nuclear facility, issued on 27.12.2011, OJ (Dz. U. 2012) item 556, in force since 5.06.2012.

2012

- Council of Ministers regulation on assign special-purposes subsidies for ensure nuclear safety and radiological protection dedicated to activities involving exposure, issued on 26.03.2012, OJ (Dz. U. 2022) item 487, as amended, in force since 13.04.2012;
- Council of Ministers regulation on activities important for nuclear safety and radiological protection in an organizational unit conducting activity which consists in commissioning, operations or decommissioning of a nuclear power plant, issued on 10.08.2012, OJ (Dz. U. 2012) item 1024, in force since 2.10.2012;
- Council of Ministers regulation on detailed scope of assessment with regard to land intended for the location of a nuclear facility, cases excluding land to be considered eligible for the location of a nuclear facility and on requirements concerning location report for a nuclear facility, issued on 10.08.2012, OJ (Dz. U. 2012) item 1025, in force since 2.10.2012;
- Council of Ministers regulation on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design, issued on 31.08.2012, OJ (Dz. U. 2012), item 1048, in force since 5.10.2012;
- Council of Ministers regulation on the scope and method for the performance of safety analyses prior to the submission of an application requesting the issue of a license for the construction of a nuclear facility and the scope of the preliminary safety report for a nuclear facility, issued on 31.08.2012, OJ (Dz. U. 2012), item 1043, in force since 5.10.2012;
- Council of Ministers regulation on amount of payment for the costs of spent nuclear fuel and radioactive waste disposal and cost of nuclear power plan decommissioning by the licensee, issued on 10.10.2012, OJ (Dz. U. 2012), item 1213, in force 21.11.2012.

2013

- Council of Ministers regulation on nuclear safety and radiological protection requirements for the stage of decommissioning of nuclear facilities and the content of a report on decommissioning of a nuclear facility, issued on 11.02.2013, OJ (Dz. U. 2013), item 270, in force 14.03.2013;
- Council of Ministers regulation on requirements for the commissioning and operation of nuclear facilities, issued on 11.02.2013, OJ (Dz. U. 2013), item 281, in force 16.03.2013.

2015

- Council of Ministers regulation on radioactive waste and spent nuclear fuel, issued on 14.12.2015, OJ 2022, item 1320, in force since 30.12.2015;
- Council of Ministers regulation on periodical safety assessment of a radioactive waste repository, issued on 14.12.2015, OJ 2016, item 28, in force since 23.01.2016.

2020

- Regulation of the Council of Ministers 30.11.2020 types of protective actions introduced in an external zone, and the operational intervention levels constituting a basis for the introduction of these actions in the external zones;
- Regulation of the Council of Ministers 30.11.2020 providing for itinerant workers exposed during work in a controlled or supervised area;
- Regulation of the Council of Ministers 17.12.2020 on building materials which require determining the activity concentration of radioactive potassium K-40, radium Ra-226 and thorium Th-232 isotopes, requirements to be fulfilled by these determinations, and the value of the activity concentration index which, once exceeded, requires informing proper authorities.

2021

- Regulation of the Council of Ministers 10.03.2021 on cases in which the performance of exposure- related activity involving ionising radiation originating from natural radioactive isotopes does not require a notification;
- Regulation of the Council of Ministers 05.03.2021 on radiation protection officers;
- Regulation of the Council of Ministers 05.03.2021 on the position of major importance for ensuring nuclear safety and radiation protection;
- Regulation of the Council of Ministers 10.03.2021 on cases in which activities involving exposure to ionising radiation do not require a license, registration or notification and cases in which they may be performed on the basis of a registration or notification;
- Regulation of the Council of Ministers 25.05.2021 requirements for the registration of individual dose;
- Regulation of the Council of Ministers 25.05.2021 the scope of a hazard assessment resulting from an activity involving exposure to ionising radiation, and the form of presenting conclusions from the hazard assessment;
- Regulation of the Council of Ministers 25.05.2021 on emergency plans in the event of radiation emergencies;
- Regulation of the Council of Ministers 11.08.2021 on nuclear regulatory inspectors;
- Regulation of the Council of Ministers 11.08.2021 on indicators enabling the determination of ionizing radiation doses used when assessing exposure to ionizing radiation;
- Regulation of the Council of Ministers 30.08.2021 on documents required when submitting an application for the issuance of a license to perform an activity related to exposure to ionizing radiation;
- Regulation of the Council of Ministers 01.10.2021 on the security of radioactive sources;
- Regulation of the Council of Ministers 09.08.2022 on scope of environmental radiation monitoring program developed and implemented by organizational entities included in category I or II of hazards.

Regulation on the Prime Minister:

- Prime Minister regulation on the procedures for the supervision and inspection discharged by the nuclear regulatory bodies in the Internal Security Agency, Intelligence Agency, and Central Anti-Corruption Bureau, issued on 8.01.2010, OJ (Dz. U. 2010) No. 8 item 55, in force since 3.02.2010.

Regulation of the Ministry of Environment:

- Minister of Environment Regulation on the Council for Nuclear Safety and Radiological Protection, issued on 18.11.2011, OJ (Dz. U. 2011) No. 279, item 1643, in force since 11.01.2012.

Regulation of the Minister of Interior and Administration:

- Minister of Interior and Administration regulation on the list of border crossings across which nuclear material, radioactive sources, installations containing such sources, radioactive waste and spent nuclear fuel can be imported into and exported from the territory of the Republic of Poland, issued on 13.04.2011, OJ (Dz. U. 2011) No. 89 item 513, in force since 14.05.2014;
- Regulation of the Minister of Interior and Administration 22.04.2021 on the scope of information covered by the order for non-medical exposures using radiological equipment for the purpose of immigration, age assessment of persons and identification of objects hidden in the human body.

Regulation of the Minister of Finances

- Minister of Finances Regulation on guaranteed minimum amount of the compulsory civil liability insurance of the nuclear facility's operator, issued on 14.09.2011, OJ (Dz. U. 2011) No. 206 item 1217, in force since 29.09.2011.

Regulation of the Minister of Economy

- Regulation of the Ministry of Economy on detailed rules and conditions for the establishment and operation of Local Information Committees and for the cooperation in nuclear power facilities, issued on 23.07.2012, OJ (Dz. U. 2012) item 861, in force since 11.08.2012.

Regulation of the Minister of Health

- Minister of Health Regulation on detailed conditions for safe work involving radiological equipment, issued on 21.08.2006, OJ (Dz. U. 2006), No. 180, item 1325, in force since 20.10.2006;
- Minister of Health Regulation on supervision and inspection of the compliance with radiological protection conditions in organizational entities using X-ray devices for the purposes of medical diagnostics, interventional radiology, surface radiotherapy and non-oncological diseases radiotherapy, issued on 22.12.2006, OJ (Dz. U. 2007), No. 1, item 11, in force since 20.01.2007;
- Minister of Health Regulation on psychiatric and psychological tests of employees performing activities important for nuclear safety and radiological protection at the

organizational unit conducting activities related to exposure which consist in commissioning, operation or decommissioning or a nuclear power plant, issued on 29.09.2011, OJ (Dz. U. 2011) No. 220 item 1310, in force since 14.10.2011;

- Minister of Health Regulation on training in the field of radiological protection of patients, issued on 6.03.2020, (Dz. U. of 2022, item 851), in force since 11.03.2020;
- Minister of Health Regulation on areas where the average annual radioactive concentration of radon in the indoor air in a significant number of buildings may exceed the reference level, issued on 18.06.2020 (Dz. U., item 1139), in force since 31.07.2020;
- Regulation of the Minister of Health on commissioning non-medical exposures related to employment or insurance issued on 27.08.2020 (Dz. U., item 1568) – in force since 26.09.2020;
- Regulation of the Minister of Health 6.03.2020 on trainings in radiation protection of patients
- Regulation of the Minister of Health 27.08.2020 on an order to perform non-medical exposures related to employment or insurance
- Regulation of the Minister of Health 08.06.2020 on the scope of information contained in the Central Database for Medical Exposures
- Regulation of the Minister of Health 13.09.2021 on the minimum requirements for health care units conducting medical exposure activities involving the provision of X-ray diagnostics, interventional radiology or diagnostics involving the administration of radiopharmaceutical products to patients X- ray diagnostics
- Regulation of the Minister of Health 14.10.2021 on radiation protection officer authorization to exercise internal supervision over compliance with radiation protection requirements in health care units
- Regulation of the Minister of Health 19.10.2021 on the minimum requirements for health care units conducting activity involving exposure for medical purposes
- Regulation of the Minister of Health 18.10.2021 on the form and detailed scope of reference medical radiological procedures for standard medical exposures and specific medical radiological procedures
- Regulation of the Minister of Health 19.10.2021 on the information contained in the National Database of Radiological Equipment
- Regulation of the Minister of Health 06.12.2022 on diagnostic reference levels
- Regulation of the Minister of Health 06.12.2022 on the detailed scope of internal and external clinical audits and the template of their reports
- Regulation of the Minister of Health 13.12.2022 on the categories and eligibility criteria for unintended and accidental exposures, actions to be taken at the health care unit after their occurrence, and the scope of information covered by the Central Database of Unintended and Accidental Exposures

Regulation of the Minister of Climate:

- Minister of Climate Regulation on the standard form of identity document of nuclear regulatory inspector, issued on 27.08.2020, (Dz. U., item 1518), in force since 4.10.2020;
- Minister of Climate Regulation of September 18, 2020 on subjective and targeted subsidies and the annual financial and material plan of the ZUOP.

Annex VII. Radiation protection rules and dose limits in Poland

The radiological protection issue at the national level is broadly addressed in the chapter 3 of Atomic Law Act and relevant several secondary regulations in which internationally endorsed criteria and standards had been incorporated (ICRP Publication 103, IAEA BSS, relevant EU directives).

Dose limits are established strictly according to the EU Directive 2013/59 EURATOM in the Atomic Law Act. The effective dose limit for workers is 20 mSv per calendar year. The equivalent dose limit for the lens of eye is 20 mSv per calendar year (it is allowed to exceed it up to the 50 mSv in calendar year provided that in consecutive 5 calendar years period of his occupational exposure the worker shall not exceed effective dose of 100 mSv), for the skin - 500 mSv per calendar year and for the hands, forearms, feet and ankles – 500 mSv per calendar year. In special circumstances, in specified time and area, excluding emergencies, the PAA President may, where a specific operation so requires, authorise individual occupational exposures of category A worker exceeding the established dose limits. However, the effective dose of may be authorised up to 50 mSv in a single year, provided that the average annual dose over any five consecutive years, including the years for which the limit has been exceeded, does not exceed 20 mSv. The apprentices, students, pregnant workers, and, if there is a risk of intake or bodily contamination, breastfeeding workers, are excluded from such exposures.

For apprentices and students over 18 years old the dose limits are the same as for occupational exposures. For this category for age between 16 and 18 years old the yearly effective dose limit is 6 mSv and yearly equivalent dose limits are: 15 mSv – lens of the eye, 150 mSv - for the skin and for the hands, forearms, feet and ankles. The dose limits for apprentices and students younger than 16 years are the same as for members of the public. For public exposure the effective dose limits is 1 mSv per calendar year and the equivalent dose limits are: 15 mSv per calendar year for the lens of eye and 50 mSv per calendar year for skin. Female worker, from the moment when she notifies the head of organizational entity of her pregnancy, shall not be employed in conditions which would result in the effective dose for her unborn child in excess of 1 mSv. Besides the dose limitation, the workers and public exposures are subject to optimization. For this purpose the radiation protection targets may be established by the management of facility. Moreover, the effluents may be discharge to the environment if its radioactive concentration in the environment may be disregarded from the radiological protection point of view. The discharging of effluents are under control by the regulatory body and numerical values of relevant limits for radioactive waste are included into the terms of license. For the purpose of protection of population living in vicinity of nuclear facility restricted-use area is established within such distance from the facility, that the effective dose connected with operation of this facility at its perimeter does not exceed the value of 0.3 mSv/y. Effective dose connected with siting, construction, operation and closure (also after closure) of nuclear waste repository from all routes of exposure shall not exceed the value of 0,1 mSv/y.

Under the Atomic Law, the responsibility for compliance with the nuclear safety and radiological protection requirements rests upon the head of the organizational entity conducting activities/practices involving exposure (Art. 7). This exposure must not exceed the dose limits described above, established in the Atomic Law Act. At the same time the principle of exposure optimization must be observed (Art.9). This means that the activity should be conducted in such way that – after reasonable consideration of economic and social factors and the current state of technical knowledge – the number of exposed workers and members of general public and their doses are as low as reasonably achievable. According to this principle, the head of the organizational entity shall perform an assessment of the employees' exposure. If the optimization analysis indicates such necessity – head of

the organizational entity shall establish for them further limitations of exposure in such manner, that the ionizing radiation doses received would not exceed established dose constraints. If the dose constraints are established in the license, the licensing authority has to be notified of the possibility of their overrun by the head of the organizational entity. The assessment of the employees' exposure is based on the of individual dose measurements or dosimetric measurements in the workplace. The workers whose exposure – according to the head's assessment – can exceed 6 mSv in one year in the terms of effective dose or 15 mSv in one year for eye lens or 150 mSV in one year for skin or limbs in terms of equivalent dose, shall be subject to the exposure assessment based on systematic individual dose measurements (category A workers). For these workers the organizational unit director is obliged to maintain a register of their individual doses based on systematic measurements conducted by properly accredited entities. The data concerning these exposures must be relayed systematically (in compliance with the requirements established in the Regulation of the Council of Ministers of 21 May 2021 on the individual dose records) to the authorized medical practitioner, who maintains medical records of these workers, and also to the central dose register of the PAA President.

Fundamental set of nuclear safety and radiological protection requirements is established by the provisions of the Atomic Law Act of 29 November 2000 and also by the executive regulations to this Act. Detailed requirements, concerning specific facilities and activities conducted by individual organizational unit basing on the license issued by the PAA President, are specified in the licensing conditions. These conditions take into account the results of assessments and analyses performed to establish the operational conditions and limits assumed in the documentation (in particular in safety reports) concerning these facilities and activities.

The Act takes into account the Basic Safety Standards for radiation protection, accepted and recommended by a number of international organizations, e.g. IAEA or European Union. It is aimed at ensuring the compliance with the provisions of the EURATOM Treaty and appropriate EU directives. Besides of the Directive 2013/59/EURATOM on basic safety standards in health services, for the protection of workers and of the members of the public against the ionizing radiation risks, the Atomic Law provisions introduce the requirements contained in other EU directives, relevant for the protection of workers and general public.

Annex VIII. Overview Matrix

TYPE OF LIABILITY	LONG-TERM MANAGEMENT POLICY	FUNDING OF LIABILITIES	CURRENT PRACTICE / FACILITIES	PLANNED FACILITIES
Spent Fuel	Deep Geological Repository, but other options are not excluded (i.e. reprocessing)	Decommissioning fund - Funded by fees on nuclear energy production according to Atomic Law Act	Only spent fuel from research reactor practice – wet storage (2 interim storage facilities No 19 and 19A or RR technological pool), transport to the country of origin (the Russian Federation)	Deep Geological Repository
Nuclear Fuel Cycle Waste	Disposal in New Near Surface Repository and in planned Deep Geological Repository	Decommissioning fund - Funded by fees on nuclear energy production according to Atomic Law Act	N/A	New Near Surface Repository/Deep Geological Repository
Institutional Waste	Disposal in Różan Repository or New Near Surface Repository	Producer pays	Storage in Otwock or disposal in Różan Repository	New Near Surface Repository
Decommissioning liabilities	According to Atomic Law Licensee is responsible	Decommissioning fund or State Budget (Research Reactor)	Ewa Research Reactor in II phase of decommissioning (III stage not considered)	N/A
Disused sealed sources	Return to manufacturer, disposal SL DSSs in Różan Repository or New Near Surface Repository; disposal LL DSSs in Deep Geological Repository	Licensees, State responsibility for orphan sources	Return to manufacturer, storage in Owtock, disposal in Różan Repository	New Near Surface Repository for SL DSSs; Deep Geological Disposal for LL DSSs