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 7th national report as referred to in Article 32 of the Joint Convention

October 2020

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

HEU – Highly Enriched Uranium

HL – High Level

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

SF/SNF – Spent Fuel/Spent Nuclear Fuel

SFA – Spent Fuel Assembly

SL – Short-lived

ZUOP – Radioactive Waste Management Plant

List of Tables

List of Figures:

SECTION A. INTRODUCTION

This Report has been prepared, according to 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 seventh one, following the previous six national reports, issued respectively in May 2003, October 2005, October 2008, October 2011, October 2014 and October 2017, and which have been presented during 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 and May 2018, 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 improvements which have been made in the field of policy making since the last review meeting. It refers to the matters that were suggested during the sixth review meeting to be addressed in the Polish 7th national report.

Facilities concerned

Poland never had neither any nuclear power reactor nor any nuclear fuel cycle facility, except uranium mine, in operation. Mining of uranium ore ended in 1968, and processing was terminated in 1973, being not a source of any new waste at present. There are no waste from power reactor operation or spent fuel reprocessing activities in Poland. The radioactive waste originates then from research reactors, scientific and educational institutions, industry and hospitals. This waste comes from various applications of ionising radiation used in ca 4400 institutions.

Main institutions engaged in radioactive waste management are following:

A. National Centre for Nuclear Research (NCBJ)

NCBJ is the operator of the MARIA research reactor, the only Polish operational reactor, located in Świerk. It is a high-flux pool-type reactor with the nominal thermal power of 30 MWt. The MARIA reactor was commissioned in 1974, and in the years 1985–1993, the reactor was shut down for the necessary upgrading which included 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 decreasing the fuel enrichment from 80% to 36% of the U-235 isotope content (HEU – High Enriched Uranium). As a part of implementation of the Global Threat Reduction Initiative (GTRI) programme, in 2014, the MARIA reactor was adapted to work using low enriched uranium (LEU) fuel with the content of the U-235 isotope below 20%.

The first research reactor “EWA” (pool type) 10 MW_{th} (first criticality date 1958/06/14), used for isotopes production and physical experiments in horizontal channels, was shut down and unloaded of fuel in 1995. The reactor decommissioning process, which started in 1997, in 2002 reached the status referred to as “the end of phase two.” It means that nuclear fuel and all irradiated structures and components whose activity level might have been hazardous from the perspective of radiological protection, were removed from the reactor. As a result, the EWA reactor does not release any radioactive substances to the environment. The reactor building

has been repaired and the offices were adapted for use by the Radioactive Waste Management Plant.

B. Radioactive Waste Management Plant (ZUOP)

Radioactive waste of low and medium level, produced in Poland, is processed and stored by the State-owned public utility "Radioactive Waste Management Plant" – ZUOP. ZUOP is the operator of following facilities located in Świerk and in Różan:

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

Facility No. 19 was used to store the encapsulated spent low enriched nuclear fuel EK-10 from the EWA reactor, 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 decommissioning of the EWA reactor and operation of the MARIA reactor, as well as disused high-activity gamma radiation sources.

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

Facility No. 19A was used for storage of spent highly enriched nuclear fuel marked as 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 MARIA reactor's operation in the years 1974–2005. Since all the spent nuclear fuel from storage no. 19A was shipped back to the Russian Federation in 2010, the Storage is currently used as a backup for storage of spent fuel from the MARIA reactor in case of emergency.

Currently, facilities No. 19 and 19A does not store any spent nuclear fuel assemblies. Under GTRI programme all spent HEU nuclear fuel has been shipped back to the Russian Federation.

ii. Radioactive waste management facilities – located in Świerk

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, radiochemical laboratories class I, III and Z 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 of radioactive waste disposal in Poland. The NRWR is a near-surface type repository, intended for disposal of SL, LILW (with the half-life of radionuclides being shorter than 30 years). It is also used to store LL, mainly alpha radioactive waste, waiting to be placed in a deep geological repository. The NRWR has been in operation since 1961, and it is the only facility of this type 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,
- Radioactive Waste Management Plant,
- National Centre for Nuclear Research.

Conclusions of the 2018 review meeting

Within the Country Group No. 1 at the 6th Review Meeting, many issues related to both spent nuclear fuel and radioactive waste management emerged and were discussed. No suggestions and good practices have been identified in the 6th 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 discussion after National Presentation, there

were no points of disagreements. At the end of the review meeting, the following challenges were identified:

- Effective implementation of the National Plan for management of RW and SF,
- Plans for closure of the Różan Repository – finalize selection of the closure concept and preparation of safety reports,
- New repository for L&ILW – choice of location by 2018 preceded by detailed research, construction by 2023, operation by 2025 (schedule depends on the updated National Plan),
- Site selection for Polish Underground Research Laboratory and selection of the site for deep geological repository,
- Continuing to ensure Regulatory Body maintains adequate resource levels in light of a significant new build programme.

Actions taken in relation to the above challenges and the related status will be discussed in the present 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 (2019 Off. Journal Item 1792, as amended). Policy details are provided for by the National Plan for the Management of Radioactive Waste and Spent Nuclear Fuel (the National Plan), as adopted by Council of Ministers' Resolution No. 195 of 16 October 2015. The National Plan was 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 permitting to define all necessary actions and designate tasks that will result in achievement of 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 determines objectives of subsequent works. Moreover, it overviews 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 so far and its forecast future supplies. The National Plan also aims at ensuring the consistency in management of such substances, optimizing development and use of the resources for radioactive waste and spent nuclear fuel management. The National Plan is the result of cooperation of all institutions involved in management of radioactive waste and spent nuclear fuel, with consideration of experience of other countries.

Pursuant to the provisions of the Directive and the Atomic Law Act, Poland is obliged to subject 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 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 IAEA mission was in Poland from 1st to 10th of October, 2017. The team of experts of the International Atomic Energy Agency 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. 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

At present, MoE prepared the update of National Plan. This document only makes the data of activities more realistic and connected with update of Energy Policy up to 2040 and update of Polish Nuclear Power Program. More details on the actions taken in the field of radioactive waste and spent nuclear fuel management are given in the Annex I prepared by MoE.

Spent fuel management policy

The management of spent nuclear reactor fuel, that means all practices involving reprocessing, handling, storage or disposal of spent nuclear fuel, including facility decommissioning, is permitted after undertaking the measures defined in appropriate regulations, aimed at ensuring the safety and protection of human life and health, as well as protection of property and the environment. This rule applies in particular also to the longer-term management and ultimate disposal of the spent fuel that has already been accumulated from the operation of research reactors and may arise from the nuclear programme in Poland.

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

Global Threat Reduction Initiative – Russian Research Reactors Fuel Return Program

In accordance with the Global Threat Reduction Initiative, the preparation for repatriation of HEU-type spent nuclear fuel to the Russian Federation started in 2007 with financial and logistic support of US Government. The shipment program was prepared by 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 by virtue of the Ordinance No 132 of the Prime Minister as of 14 November 2007. The said team was led by the PAA President. The implementation of the program started in 2009 and by the end of 2016 there had been 8 shipments of highly enriched (i.e. exceeding 20% U-235) spent nuclear fuel from Polish research reactors EWA and MARIA to the Russian Federation. All the shipments were performed on schedule and with no disturbances. Detailed information related to each shipment is included in the previous National reports.

Spent fuel management practices

In Poland, spent nuclear fuel (SNF) has been generated from the operation of two research reactors (RR) named EWA and MARIA. The EWA RR had been in operation for 37 years. The reactor was shut down in 1995 and decommissioned (to another use). During operation of both research reactors, various types of fuel were used:

EK-10 fuel type (LEU) in 1958 – 1967 (EWA RR);

WWR-SM fuel type (HEU) in 1967 – 1995 (EWA RR);

WWR-M2 fuel type (HEU) in 1990 – 1995 (EWA RR);

MR-5 and MR-6 fuel type (HEU) - 1974 onwards (MARIA RR).

The WWR-SM and WWR-M2 fuel were 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. During it operation, from July 2017 to June 2020, two types of fuel were used, MC-5 and MR-6 fuel type (LEU).

In 2013, two test LEU fuel assemblies (MR-6) have been introduced to the reactor core. First of them was removed in January 2014 after reaching 40 % burnup and the second was removed in July 2014 after reaching 60 % burnup. Both elements now are stored in the reactor technological pool.

From 2009 to June 2020, ninety one LEU fuel assemblies (MC-5) have been introduced to the reactor core, of which eighty eight were removed by 30 June 2020 after reaching 60 % burnup and now are stored in the MARIA reactor technological pool.

From 2018 to June 2020, twenty five LEU fuel assemblies (MR-6) have been introduced to the reactor core, of which three were removed by 30 June 2020 after reaching 60 % burnup and now are stored in the MARIA reactor technological pool.

Currently, in the MARIA reactor technological pool are stored eighty eight LEU (MC-5) spent nuclear fuel elements and five LEU (MR-6) spent fuel elements.

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,
- export outside the MARIA reactor facility.

Radioactive waste management policy

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

- designing, construction, operation and closing of the system facilities, ensuring nuclear safety and radiological protection,
- minimizing the quantity, volume and activity of radioactive waste as well as sorting, classifying, reprocessing, packaging and appropriate designation of packaged radioactive waste, taking into account its composition,
- application of the "polluter pays" principle,
- application of the decision-making process based on documented evidence in all stages of radioactive waste and spent nuclear fuel management,
- use of an open fuel cycle and monitoring of trends concerning the nuclear fuel cycle. If economic and technical conditions arise, which are favorable for introduction of a closed cycle, an analysis will be made of the validity and advisability of its introduction in Poland,
- monitoring of storage, depositing and transportation of radioactive waste and spent nuclear fuel,

- a ban on entry to Poland of radioactive waste for depositing and exports, with the exception of exports to the country with which an agreement has been concluded on dispose of radioactive waste in radioactive waste repositories,
- an appropriate approach to radiation hazards, emergency response and crisis management being in accordance with international standards,
- continuity of personnel training to guarantee safety in management of radioactive waste and spent nuclear fuel,
- developing training-and-information activities,
- transparency of the undertaken activities and providing information to the society,
- ensuring public participation in the decision-making process,
- constant cooperation with international organizations and institutions dealing with radioactive waste and spent nuclear fuel management,
- application of the latest achievements of science and technology concerning radioactive waste and spent nuclear fuel management.

Radioactive waste management practices

According to art. 48a of Atomic Law Act organizational entity in which wastes are produced is responsible for ensuring the possibility of management of radioactive wastes. After collection and transport to Świerk the responsibility for all radioactive waste management is taken over by the Radioactive Waste Management Plant. The diagram of the radioactive waste management system is shown in Fig. 2. ZUOP performs 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 the operation of this repository. The users are responsible for proper segregation and categorization of waste before the waste are collected by ZUOP.

R&D in radioactive waste management area are performed by various research groups from NCBJ and from other scientific institutes.

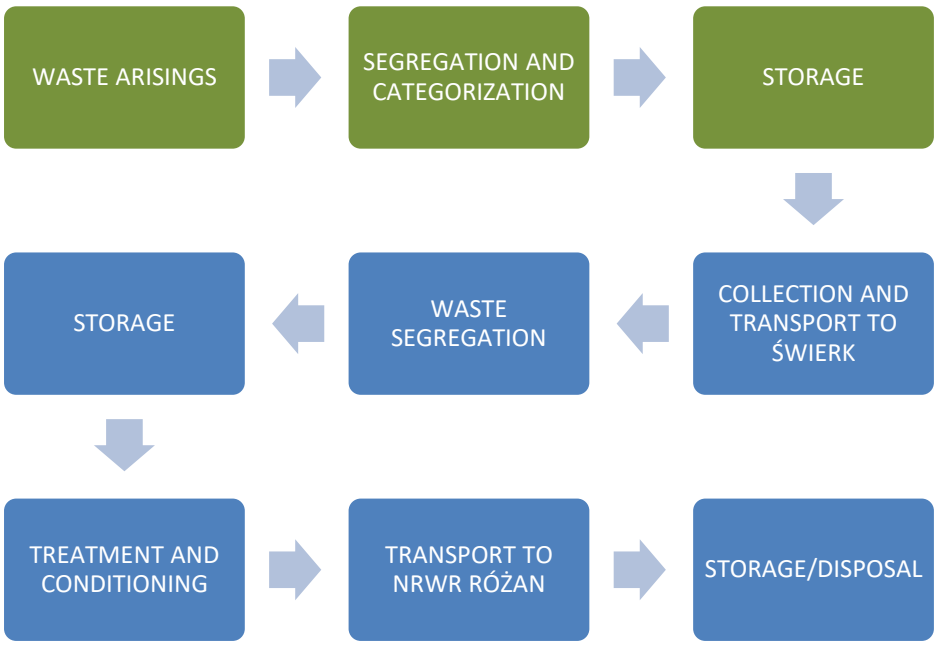

Fig. 2. The diagram of the radioactive waste management system in Poland (green-radioisotopes users, blue-ZUOP)

Waste arisings

Currently, radioactive waste in Poland, comes from:

- MARIA research reactor,
- scientific and educational institutions, industrial organizations and hospitals. More than four thousands radiation sources users are scattered over the country. Only low- and intermediate level waste is produced. Most of spent high activity gamma sources are transported back to the supplier abroad, but number of them, mainly of Soviet origin, still remain at the user's premises, or is stored at ZUOP storage facilities in Świerk.

Waste treatment and conditioning

ZUOP owns three systems for liquid radioactive waste volume reduction. Currently, two of them are in use: evaporation method and reverse osmosis, 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 to use, if needed.

The 3-stage reverse osmosis unit – JP3RO consists of two different types of membrane modules: SU-720R and SU-810 (TORAY). JP3RO unit can be used separately for purification of low salt content effluents mainly water from primary reactor circuit or combined with evaporator.

Liquid ILW, as well as waste arising from decontamination are evaporated.

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

The solid waste is being segregated. About 60% of total volume of the waste is subjected to the compaction technique with use of hydraulic press. Volume reduction factors obtained were ranging from 3 to 5, depending on waste type. Ion-exchange resins are conditioned by dewatering and solidification in polyester resin. The solid and conditioned waste is packed into the standard metal drums, zinc - plated or varnished on both sides.

Radium sources are immobilized with glass and placed into brass containers. Subsequently, the brass containers are located in the storage containers and transported to the repository. A storage container for spent radium sources is shown in Fig.3.

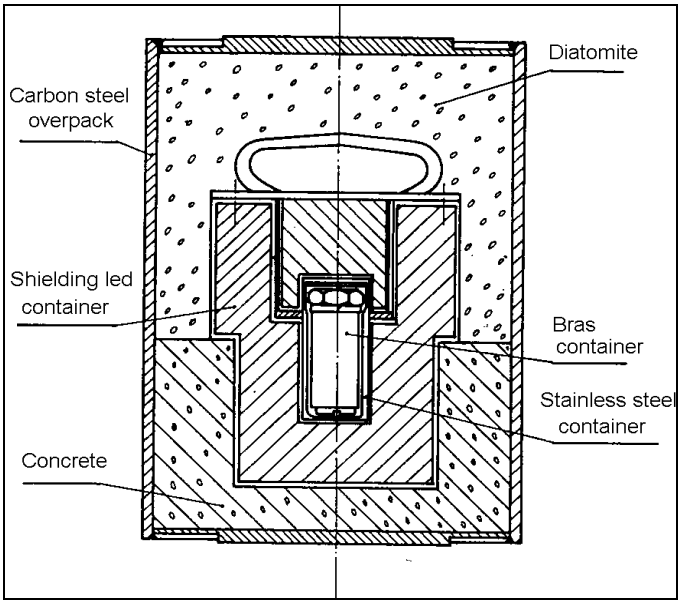

Fig. 3. Storage container for spent radium sources

Smoke detectors containing mainly americium or old type of detectors containing plutonium sources are dismantled and separately immobilized in 1 dm^3 metal box with using of polyester resin. Metal boxes are subsequently placed in 50 dm^3 zinc-plated metal drum and grouted with concrete. Other parts of the smoke detectors in which plutonium contamination did not exceed the clearance level, are released from the radioactive material restrictions.

Waste storage and disposal

ZUOP operates one storage facility (No. 93) at Świerk for SL and LL waste and DSRS. What is more, the spent fuel storage facility No. 19 is also used for storage of some solid radioactive waste from EWA reactor's decommissioning and from MARIA reactor's operation and also spent high activity gamma radiation sources.

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

Criteria used to define and categorize radioactive waste.

In accordance with art. 47 of Atomic Law:

Radioactive waste is classified into three categories with respect to the concentration of radioactive isotopes contained in the waste: low-, intermediate- and high level radioactive waste. These categories are further subdivided into subcategories according to the half-live of radioactive isotopes and the concentration of 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. Those sources are classified into the following subcategories of spent sealed radioactive sources according to the level of their activity: low-, intermediate- and high-level, which are

further subdivided according to the half-life of contained radionuclides into short-lived and long-lived sub-categories.

Table 1. Radioactive Waste Classification

Category		Subcategory		
		Transitional	Short-lived	Long-lived
LLW	EAC < A ≤ 10^4 EAC	Activity concentration of isotopes is to fall below the level specified for low-activity waste after 3 years[1]	t1/2 ≤ 30 years A ≤ 400 kBq/kg for long-lived isotopes	t1/2 > 30 years A > 400 kBq/kg for long-lived isotopes
ILW	10^4 EAC < A ≤ 10^7 EAC			
HLW	A >10^7 EAC			

Disused sealed radioactive sources form an additional radioactive waste category and depending on the level of activity are attributed to low activity, medium activity or high activity sealed source sub-categories, further subdivided into short-lived and long-lived waste depending on the rate of decay of the isotopes that are contained therein.

Table 2. DSRS classification

Disused sealed radioactive sources[2]	Sub-category			
	Low activity	Intermediate activity	High activity	
	EA < A ≤ 10^8 Bq	10^8 < A ≤ 10^{12} Bq	A >10^{12} Bq	Short-life t1/2 ≤ 30 years
				Long-life t1/2 > 30 years

[1] Isotope activity and concentration thresholds for waste attribution to the category of radioactive waste are specified in Appendix II

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

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).

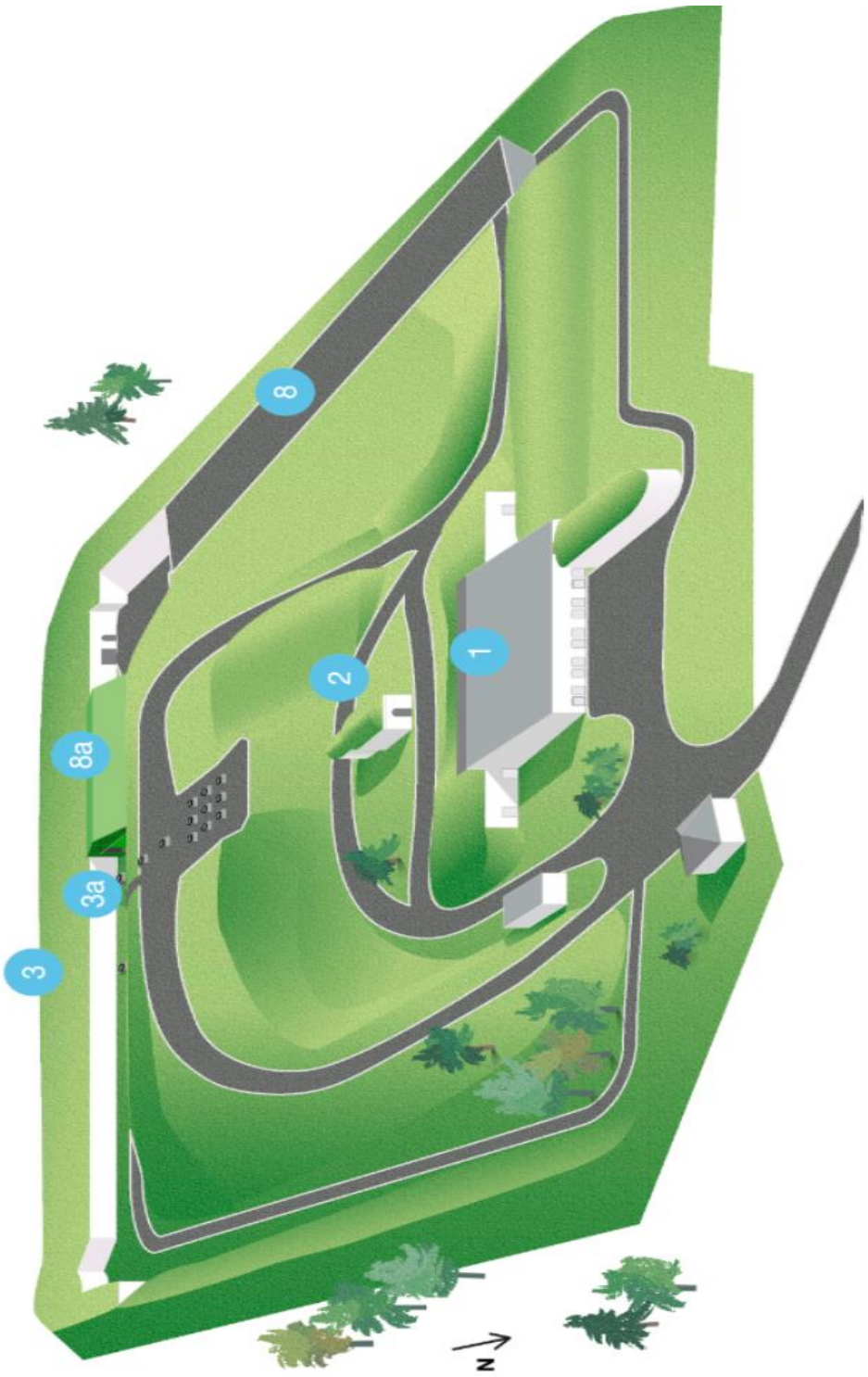

Fig. 4. National Radioactive Waste Repository in Różan

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 to be a part of spent fuel management, pursuant to Article 3(1).

No waste that contains only naturally occurring radioactive material and does not originate from the nuclear fuel cycle has been declared by Poland as radioactive waste for the purposes of the Convention, pursuant to Article 3(2).

Neither spent fuel nor radioactive waste within 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 the facilities listed above are located at Świerk. Spent fuel storage facilities are operated by the Radioactive Waste Management Plant. The technological pool of MARIA Research Reactor is also located at Świerk 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 for storage some solid radioactive waste from EWA reactor's decommissioning and from MARIA reactor's operation and also 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 half-underground concrete structure with two rectangular ponds. Each pond is lined with 6 mm stainless steel sheet mounted in 1999-2000. The facility is equipped with 10 tons crane and device for handling of spent fuel. Both ponds can be used for SFAs storage. The capacity of those facilities is sufficient for storage of all spent fuel rods and assemblies from the MARIA RR. This storage is used as a backup for the purpose of spent fuel storage from MARIA reactor in case of emergency. Currently, there is 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 suitable cooling time before it is shipped to another place.

Spent fuel inventory

As of June 30th, 2020, ninety three SFAs including MR-6 and MC-5 fuel type are being stored in MARIA RR technological pool. Characteristics of the spent fuel currently stored in MARIA RR technological pool are given below.

Table 3. Spent fuel from Polish research reactor MARIA (30.06.2020)

Parameter	Fuel Type		
Fuel Type	MC-5 (LEU)	MR-6 (LEU)	MR-6 (LEU)
Fuel Operation	2009-2020	2013-2014	2018-2020
Number of fuel assemblies	88	2	3
Dimensions: Length, Diameter	1315 70 mm	1380 70 mm	1478* 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)	0-10	0-7	0-1
Mass U-235 in single element (g)	485	490.5	485
Total mass of U-235 [g]	45 124.40		
Total mass of uranium [g]	228 393.76		

* the total length of the element

List of radioactive waste management facilities

Radioactive Waste Management Plant (ZUOP) operates following waste management facilities:

- **Radioactive liquid waste storage farm capacities (Building No. 35 A and B - Świerk):**
  - 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.

- **Radioactive Waste Treatment Station (Building No. 35- Świerk)**
  - evaporator: 300 dm^3/h evaporated water, natural circulation, steam healing,
  - 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,
  - installation for cementation – 8 drums of 200 dm^3 per shift,
  - two laboratories class III dedicated to work with strictly defined activity of groups of radioisotopes

- **Radioactive waste storage facility (Building No. 93- Świerk) used for:**
  - storage conditioned waste before shipment to the National Radioactive Waste Repository,
  - smoke detectors,
  - storage of waste for decay,
  - spent sealed sources in shielding containers,
  - nuclear materials.

  Total surface: 400 m^2

- **Building R1 decommissioned EWA reactor**
  - Laboratory class I, dedicated to work with strictly defined activity of groups of radioisotopes,
  - Laboratory class Z where devices containing radioactive sources are in operation,
  - Shredding unit for uncontaminated elements with dismantle detectors smoke.

- **National Radioactive Waste Repository – Różan (NRWR)**

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

At present, following facilities located at NRWR area are used (see Fig. 4):

- No. 1 (partially) – storage for SL LILW,
- No. 3a – disposal of SL LIL DSRS,
- No 8 – disposal of SL LILW,
- No 8a – storage for LL LILW.

Historical SL and LL LILW waste (non-segregated, only partially conditioned and packed) are stored in the facilities No 1, 2, 3.

Radioactive waste inventory

Waste being held in storage at radioactive waste management and nuclear fuel cycle facilities operated by ZUOP**:**

Table 4. Nuclear materials stored at the National Radioactive Waste Repository – Różan (1.01.1961 – 31.12.2019).

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 Różan (1.01.1961 – 31.12.2019)

Facility No.	Volume [m^3]	Activity on 31.12.2019 [GBq]	Waste Category
1	805,5	14 004,7	LLW LL
2	46,9	342,9	
3	530,5	2 449,0	
8a	3,7	756,8	
3a	1,9	5627,5	DSRS LIL SL
8	2 706,7	24 456,3	LILW SL
TOTAL	4 095,2	47 637,2	-

For the activity of particular isotopes present in the waste stored/disposed at the Różan repository in the period of time 1.01.1961 – 31.12.2019 see Annex III.

Table 6. Isotopes activity in solid waste stored in storage facility of Radioactive Waste Management Plant at Świerk

No.	Isotope	Activity on 31.12.2019 [MBq]	Initial activity [MBq]
1	Ru-106	136 148	406 251
2	U-238	75 851	75 851
3	Co-60	37 177	46 248
4	H-3	37 081	37 728
5	S-35	35 592	881 281

6	Ce-144	20 436	93 533
7	Te-121m	16 009	90 706
8	Cs-137	13 041	13 811
9	Te-123m	10 083	104 606
10	C-14	9 512	9 519
11	Te-127m	8 758	103 706
13	Sr-90	2 303	2 627
14	Co-57	2 175	5 045
15	Zn-65	1 817	26 090
16	Cs-134	1 042	3 394
17	Ni-63	491	506
18	Mn-54	127	862
19	I-131	73	412 202
20	Ir-192	72	1 072
21	U-235	62	62
22	Tc-99	52	52
23	Sc-46	48	220
24	Co-58	40	2 219
25	Eu-154	30	33
26	Eu-152	27	31
27	Th-232	21	21
28	Sr-89	20	1 159
29	Ba-133	17	31
30	Ag-110m	16	34
31	Sb-125	13	16
32	I-125	12	15 757
33	Cr-51	10	102 384
34	P-32	10	670 809
35	Yb-169	10	423
36	Ge-68	9	45
37	Ra-226	8	8
38	Am-241	7	7
39	Co-56	5	83
40	Lu-177	4	47 110
41	Ce-141	4	369 169
42	other	14	2 781 529
43	**Total:**	**408 226**	**6 306 241**

Table 7. Types of waste stored in storage facility of Radioactive Waste Management Plant at Świerk

No.	Waste	Volume [m^3]	Initial activity [GBq]	Activity on 31.12.2019 [GBq]
1	smoke detectors	45.3	7.2	7.1
2	transitional waste	42.1	481.4	1.4
3	Other	33.5	5 817.4	404.3
4	**Total:**	**120.9**	**6 306.0**	**412.8**

Category of waste: LLW, SL, LL 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 interim storage facility of Radioactive Waste Management Plant at Świerk

No.	Source	Items	Activity on 31.12.2019	Initial activity [GBq]
1	Cs-137	1	222 374	312 790
2	Co-60	35	106 078	324 860
3	Co-60	1	68 993	170 600
4	Co-60	1	59 798	174 000
5	Co-60	1	54 363	164 400
6	Co-60	1	45 552	112 800
7	Co-60	1	44 770	135 000
8	Co-60	1	32 677	169 050
9	Co-60	1	30 031	170 000
10	Co-60	1	26 849	198 900
11	Co-60	1	26 633	101 306
12	Co-60	1	26 329	58 500
13	Co-60	1	24 752	124 550
14	Co-60	1	24 052	177 600
15	Co-60	1	23 844	152 500
16	Co-60	1	22 970	169 000
17	Co-60	1	22 424	93 400
18	Co-60	1	22 247	25 500
19	Co-60	1	14 006	88 140
20	Co-60	1	9 813	92 500
21	Co-60	1	7 155	42 600
22	Co-60	1	7 088	68 000
23	Co-60	1	6 630	35 520

24	Co-60	14	6 230	15 720
25	Cs-137	1	1 151	1 534
26	Cs-137	1	1 151	1 534
27	Co-60	1	933	1 040
28	Co-60	1	179	1 360
29	Co-60	1	148	1 170
	Total:		**939 221**	**3 183 874**

Category of waste: DSRS HL, SL

Table 9. Nuclear materials stored in interim storage facility of Radioactive Waste Management Plant at Świerk

No.	Nuclear materials	Mass
1	Sources Pu-Be	499,1 g
2	Depleted U	5 907,2 kg
3	Th (chemical compounds)	0,1 kg
4	U nat (chemical compounds)	0,4 kg

Category of waste: LLW, LL

Nuclear facilities in the decommissioning process

The only facility being decommissioned so far is EWA RR. Comprehensive description of decommissioning process (including detailed timetable) was presented in previous national reports. In this edition only short summary of activities performed in years 1997-2001.

Poland has adopted the 3 stages decommissioning procedures according to previous IAEA recommendations:

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

Stage 1st and stage 2nd decommissioning of the EWA research reactor has been successfully completed.

Currently, EWA RR building is in use as a headquarters of RWMP, and additionally ZUOP’s technical infrastructure such as laboratory class I, laboratory class Z and shredding unit are located in this building. For that reason there is no plan for the implementation of the stage 3 of decommissioning.

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 has been 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 the Party of several international conventions and agreements important for safe use of atomic energy and safeguards of nuclear material. Once they had been signed and ratified, they became a crucial segment of legal framework for nuclear activities in Poland, including 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 to implement them. The updated list of the international nuclear safety arrangements (treaties, conventions and agreements) both bilateral and multilateral, to which Poland is a Party, has been annexed (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 under article 19. The President of National Atomic Energy Agency (PAA) as 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 spent fuel and waste management area.

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 (O.J. from 2019 Item 1792, as amended), introduced a consolidated system ensuring nuclear safety and radiological protection in Poland. Summary of the Atomic Law is presented in Annex V.

It should be highlighted that all requirements of Atomic Law Act and secondary legislations are in line with international standards, especially recommendations posed of IAEA documents – Safety Fundamentals, Safety Requirements and Safety Guidances. In some cases those 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 it covers the issue of 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 PAA as central authority of governmental administration serving as nuclear regulatory body in Poland. The President executes his tasks through the National Atomic Energy Agency.

The last significant amendment of the Atomic Law Act was the act of 13 June 2019 amending the Atomic Law and the act on fire protection. The Act was designed to ensure the highest achievable level of nuclear safety and radiological protection in Poland in conformity with the IAEA and European standards.

The solutions proposed in that Act can be essentially assigned to three areas:

I. Implementation into national law of the provisions of Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards to protect against risks arising from exposure to ionizing radiation (the so-called BSS directive). This is the most comprehensive and highly technical in nature part of the Act.

Issues indicated in the BSS Directive that required implementation into Polish law could be divided into two groups:

1. Issues previously regulated in the Atomic Law Act requiring legislative changes;

The most important issues related to this problem solved in the Act were:

a) regulation of non-medical imaging of people from the general public:

- establishing a list of permissible non-medical imaging situations with a division into non-medical imaging using medical radiological equipment and other radiological devices,

b) changes in regulations concerning radiological protection of workers and people from the general public in connection with new results of studies on the influence of ionizing radiation on the human body:

- adaptation to the requirements of the Directive on effective and equivalent effective dose limits as well as requirements regarding the inclusion of specific radiation doses to the dose limits,
- introduction of dose limitation of ionizing radiation,
- setting reference levels for effective doses received by members of emergency teams,
- setting reference levels for external exposure of humans to gamma rays emitted by indoor building materials,

c) increasing protection against ionizing radiation of external workers:

- coverage of external radiological protection requirements for external workers performing work not only in the controlled area (as before), but also in the supervised area,

d) clarifying the duties and rights of persons exercising internal supervision over activities,

e) increase the transparency of the activities of nuclear regulatory bodies by providing the public with a program of regulatory inspections,

f) raising awareness of the possibility of coming into contact with an orphan source, informing about actions to be taken in such a situation and training of officers of relevant services who may come across such sources,

g) increasing the safety of medical use of ionizing radiation:

h) changes in regulations regarding preparation and response in the event of radiation emergencies:

- in particular, the new law imposes an obligation on the head of the organizational unit, wojewoda (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 is one of the elements which are part of the radiation emergency management system.

2. Issues not regulated in the Atomic Law and requiring introduction into the Polish legal framework.

Issues that had not been regulated in Polish law were primarily issues related to exposure to radon in residential buildings and workplaces, issues related to the use of naturally occurring radioactive materials (NORM) or the introduction by the Directive of an additional form of regulation of activities with exposure in the form of notifications (in addition to licenses and registration so far required).

II. Implement the provisions of Council Directive 2014/87 / Euratom of 8 July 2014 amending Directive 2009/71 / Euratom establishing a Community framework for the nuclear safety of nuclear installations.

In order to implement it in the Polish legal order, the Act provides for example:

- arrangements for extending the responsibility of the head of an organizational unit authorized to construct, commission, operate or decommission a nuclear facility for contractors and subcontractors whose activities may affect the safety of a nuclear facility,
- introduction of requirements for nuclear facilities to be designed, located, constructed, commissioned, operated and decommissioned in a manner that would prevent accidents as much as possible,
- solutions for management systems that give the highest priority to nuclear safety and measures to support and increase the level of an effective nuclear safety culture,

- solutions enabling the peer review of nuclear facilities in the EU based on a specific nuclear safety issue.

III. Other issues that needed improvement in terms of nuclear safety and radiological protection.

The amendment of the Atomic Law Act provided for new requirements specific to the radioactive waste management. For example, the President of PAA, taking into account consideration of radiation protection, may, in the case of a high-activity source imported into the territory of the Republic of Poland, condition the issuance of the licence on the applying organisational entity's entering into the agreement with the manufacturer or supplier of a high activity 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 guaranty to cover the cost of source collection and management, if the handling of this source in the territory of the Republic of Poland after ending the activity involving this source might be impossible or significantly hindered.

Article 38d of the Atomic Law Act regarding decommissioning fund was amended. Previously, the tasks indicated in art. 38d of the Atomic Law Act regarding supervision of the decommissioning fund were implemented by the President of PAA, even though the tasks were not directly related to the scope of the nuclear regulatory competence, i.e. nuclear safety and radiological protection. Therefore, it was proposed to change the authority responsible for the supervision of the decommissioning fund. Failure to collect funds allowing for the proper decommissioning of a nuclear power plant is unacceptable and may prevent this process in the future, therefore it was necessary to maintain instruments that discipline the operator of a nuclear power plant. Since the order to suspend the operation of a nuclear power plant, provided in law, can be considered a sanction adequate in terms of severity, it was decided to maintain it, with the change that the authority competent to issue it, i.e. the President of PAA, acts at the request of the minister competent for energy i.e. the authority supervising the decommissioning fund. The proposed amendment shifted the decision-making burden regarding the application of the sanction to the minister responsible for energy. If he or she decides to submit an application for an order to suspend operation, the President of PAA is bound by this application. In order for the sanction to take effect as soon as possible and to have the expected effects in the form of payment to the fund for the decommissioning of outstanding amounts, the President of PAA is obliged to issue the order immediately.

Amendment to art. 53 of the Atomic Law Act consists in taking over by the minister responsible for energy the competence to grant a radioactive waste repository the status of the National Radioactive Waste Repository. Granting the radioactive waste repository the NRWR status is not related to nuclear safety and radiological protection. It is an administrative decision issued after meeting the conditions set out in the act. The only effect of which is that the commune in which the NRWR is located receives a fee from the state budget. Therefore, it is not appropriate for the NRWR status to be granted by the nuclear regulatory. This task now falls within the competence of the minister responsible for energy, who is responsible for the implementation and development of nuclear energy, as well as the use of nuclear energy, which is related to the issue of radioactive waste. The decision better protect the interests of local communities. When agreeing to build a radioactive waste repository on its premises, the commune must be sure that the state will compensate for such consent.

Amendment of art. 55c of the Atomic Law Act consists in adding the obligation for the head of an organizational unit to conduct activities related to exposure, consisting in the operation or closure of a radioactive waste repository, as well as informational and educational activities regarding the functioning of this repository. This provision is intended to provide residents of the areas adjacent to a radioactive waste repository with access to full and reliable information on the functioning of this repository. The introduction of the provision results from the identification of the need to more effectively inform the residents of the commune in which

the National Radioactive Waste Repository is located about the operation of this facility. The lack of knowledge in this regard causes unjustified fears of the local community related to the safety of the NRWR neighbourhood and contributes to the creation of many myths and misunderstandings in this regard, which hinders cooperation between the NRWR and the local community. This is particularly important in the context of choosing the location of the new NRWR - in the new location it will be necessary to intensify information activities in order to familiarize residents with a new issue for them.

This provision (mentioned above art. 55c) is also a development of the provision on public information in the field of operation of radioactive waste repositories, and is in line with the recommendations of the International Atomic Energy Agency regarding education and public information (INSAG 20 - Stakeholder Involvement in Nuclear Issues). The method of implementing the proposed obligation will depend on the NRWR and may, for example, consist in organizing information meetings with the residents of the commune, conducting educational classes for students from the commune, and organizing visits of residents to the premises of the NRWR. The type and frequency of activities will depend on the needs identified by the NRWR. The only activity indicated in the provision is the issuing of an information bulletin twice a year. The introduction of this obligation is dictated by the need to find the most effective way of communicating information to the local community. A newsletter distributed to residents in a manner customary in a given commune is currently the best measure.

The Atomic Law Act is supported by set 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 ionizing radiation exposures from artificial radioactive sources, nuclear materials, equipment generating ionizing radiation, radioactive waste and spent nuclear fuel, are supervised and controlled by the State and shall be permitted after undertaking the measures defined in appropriate regulations, aimed at ensuring and protection of human life and health and also for the protection of property and 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 have to be licensed or notified according to the criteria established in the regulation of the Council of Ministers of 6 August 2002 (amended in 2004), based on the Article 6.1 of the Atomic Law.

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

1. manufacturing, processing, storage, transport or use of nuclear materials, radioactive materials or radioactive sources, excluding the 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 mines,

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

9. production, 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, including X-ray laboratories or medical X-ray laboratories,
12. intentional administration of radioactive substances in the processes of manufacturing of:

a) consumer products,

b) medical devices, in vitro diagnostic medical devices, installations for medical devices, installations for in vitro diagnostic medical devices or active implantable medical devices as defined in Act on Medical Devices of 20 May 2010 (Journal of Laws of the Republic of Poland of 2017, item 211 and of 2018, item 650),

13. trade in the devices or equipment referred to in point 12,
14. import into and export from the territory of the Republic of Poland of the devices or equipment referred to in point 12,
15. import into and export from the territory of the Republic of Poland of consumer products to which radioactive substances have been added,
16. intended administering of radioactive substances to humans or animals for medical or veterinary diagnostics, treatment and/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

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

1. commissioning and/or use of X-ray devices in a medical X-ray laboratory and the commissioning of such laboratories,
2. 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 licence indicated above for health care units subjected to:

1. 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;
2. 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

Conducting exposure-related activities involving:

1. extraction of crude petroleum and natural gas,
2. extraction of metal ores, with the exception of uranium ores,
3. use of thermal waters for electricity production,

4. extraction or processing of phosphates, including production of phosphorus, phosphoric acid or phosphate fertilisers,
5. groundwater treatment or filtration,
6. production of crude iron from iron ore,
7. extraction of rare earths from monazite,
8. production of tin, lead or copper,
9. production of zirconium or zircons,
10. production of TiO2 pigment,
11. operation of coal-fired power plants, including maintenance of boilers,
12. cement production, including maintenance of clinker ovens,
13. processing of niobium or tantalum ore,
14. production of thorium compounds and manufacture of thorium-containing products,
15. 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,
16. 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:

1. referred to in points 1, 2 and 16,
2. 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 (Journal of Laws of 2017, Item 2126, as amended))

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

Notifications on carrying out activity involving exposure:

1. referred to in points 3 - 14,
2. 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.

License can be granted after verification that all safety requirements stated in Atomic law and supporting regulations are fulfilled and a facility is assessed to be safe, satisfying regulatory acceptance criteria. While performing the review, assessment and verification tasks, PAA may use external consultant organizations and experts. The requirements, concerning documentation to be submitted by an applicant and the procedure to be followed 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 the activities involving the exposure to ionizing radiation or with the notification of such activities. It refers to part dedicated to radioactive waste and spent nuclear fuel facilities.

Draft license related to nuclear facilities before issuance by PAA President are reviewed by Council for Nuclear Safety and Radiation Protection (CNSRP) which is consulting and opinion-giving body of the PAA President. CNSRP was created by Atomic law amendment of 2011. Council consist of chairman, deputy chairman, secretary and no more than 7 members

- experts in nuclear safety, radiation protection, physical protection, nuclear material safeguards, geology etc. The Council is elected for the 4 years term.

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 shall be permitted after undertaking the measures defined in appropriate regulations, aimed at ensuring the safety and protection of human life and health, as well as protection of property and the environment.

According to the art. 4 of Atomic Law activities involving ionizing radiation requires licenses, granted by the PAA President after ascertaining that the conditions and requirements relevant for radiation and nuclear safety at the given stage were met and fulfilled. It means, in particular, that the operation of a facility without a license is prohibited. The applicant/licensee must submit at each of the stages, together with his application for the license to the PAA President, a proper safety documentation of the facility. Results of the review and assessment of this documentation provide the regulatory body with the basis for preparation of suitable license and for the specification of the relevant requirements and conditions in the text of license document.

Import into, export from and transit through the territory of Poland of radioactive waste and spent nuclear fuel shall require (art.62.1) the license, registration or notification of the President of 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, is subject to fine penalty (art.123), imposed by the PAA President.

The Polish Criminal Code provides that whoever, without permission or contrary to stipulated conditions, possesses, uses, produces, reprocesses, collects or trades with radioactive materials or ionising sources will be liable to imprisonment for a period of six months to eight years. Whoever pollutes the water, air or ground with a substance or contaminates with ionising radiation in such quantities or form that it could endanger human life or health or cause a significant reduction in the quality of water, air or land surface or destruction in the plant or animal world in considerable dimensions will be liable to imprisonment for a period of 3 months to 5 years. Whoever, in violation of the provisions of law, manufactures, processes, transports, imports, exports, accumulates, disposals, stores, owns, uses, removes, discards or leaves without proper protection of nuclear material or other source of ionizing radiation under such conditions or in such the way it can endanger human life or health or cause a significant reduction in the quality of water, air or land surface or destruction in the plant or animal world in of considerable dimensions will be liable to imprisonment for a period of 3 months to 5 years.

Inspection and Enforcement

Activities connected with exposure of humans and environment to ionizing radiation are supervised and inspected by Nuclear Regulatory Bodies. Nuclear Regulatory Bodies consist of:

- PAA President the supreme nuclear regulatory body,
- Nuclear Regulatory Inspectors.

To became a nuclear regulatory inspector several conditions have to be fulfilled.

Candidate must hold MSc in physics, chemistry, technology or other useful specialization, medical certificate allowing employment in occupational exposure conditions and first of all, has to complete practical training with successfully passed qualification

examination, organized by commission appointed by the PAA President. Each candidate for nuclear regulatory inspector is undergoing training according to tailored individual program endorsed by PAA President on case by case basis.

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

1. periodical inspections – as per inspection plan approved by the PAA President,
2. reactive inspections – whenever circumstances arise which may have a substantial impact on the nuclear safety and radiological protection at a nuclear facility subject to inspection,
3. continuous inspections – at nuclear power plants by virtue of a permanent authorization.

During inspections inspectors are entitled to:

- unlimited access to the sites, facilities and transport vehicles,
- unlimited access to documentation, logbooks and other data carriers,
- conduct independent technical and dosimetric measurements,
- request written or oral information form employees,
- collect samples for laboratory test,
- record the processes 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 can be undertaken. During inspection in case of discovering direct threat to nuclear safety and radiological protection, the inspector is entitled to issue orders containing injunctions or interdictions addressing specified activities (e.g.: to stop the operation of a nuclear facility, to cease to perform specific works or operations). In less serious situations when conditions that might negatively affect nuclear safety and radiological protection are discovered although no legal requirements or license conditions are violated inspector can give recommendations to improve the nuclear safety and radiological protection. On the basis of inspection report the PAA President is entitled to issue post-inspection statement/decision requesting appropriate corrective actions within a specified deadline.

Additionally, in case of performing activities without license, violation of legal requirements or license conditions, prevent or impede the conduct of regulatory inspection or loss of nuclear or radioactive materials monetary fines can be imposed.

The PAA President is also entitled to revoke the license in the event when licensee ceased to fulfill the safety requirements, failed to comply with orders or decisions issued by nuclear regulatory body or failed to eliminate, within the time 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 activities covered by the license.

Allocation of responsibilities

Legal responsibility for safety lies with the license holder. The organization holding a license cannot transfer the responsibility to another organization not holding a license valid for the facility or the activity. A license must be obtained before such a transfer can take place under rules agreed with the PAA. Furthermore responsibility for compliance with the requirements for nuclear safety and radiological protection rests with the head of the entity,

who shall ensure that the activities are conducted according to optimization principle, 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. Assessment of the exposure of workers has to be performed, and if the optimization analysis indicates such necessity – shall establish for them further limitations of exposure in such manner, that the ionizing radiation doses received would not exceed established dose constraints.

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

The responsibility for regulatory control of both – the particular users, and the ZUOP - rests with the President of PAA, the legal authority to issue licenses and binding opinions, and to perform inspections of activities leading to arising 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 activity or radioactive concentration that cannot be disregarded from radiological protection viewpoint. Radioactive waste means solid, liquid or gaseous material containing radioactive substance or contaminated by such substance, further use of which is not foreseen or consider, assigned to waste category, according to its radioactive concentration and, if appropriate, to waste subcategory - according to the half-live and concentration of radioactive isotopes contained in the waste, and additionally according to activity level in case of liquid waste (art. 47.1-1c). Also DSRS, when such a decision is taken, become a separate category of radioactive waste (art. 47.2). In each case it is arbitrary decision of the head of the organizational entity on which site the waste arises to classify and register them as waste of definite category (and subcategory if appropriate).

Radioactive waste classification may be performed also by the PAA President but only in the cases of:

- discrepancy in waste classification performed by the head of the organizational entity on which site the waste is arising and the classification performed by the head of the organizational entity receiving the waste,
- ascertainment of irregularities in waste classification by the head of the organizational entity on which site the waste is present,
- not performing by the head of organizational entity waste classification.

Also spent nuclear fuel is treated as radioactive waste of high-level category - if intended 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 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 licences or receive notifications is the President of 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 licence 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 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 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 PAA are defined in the Chapter 13 of the Atomic Law Act.

PAA President 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 Article 109.2b of ALA, PAA President 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 PAA is administratively supervised by the minister competent for Climate matters. The President of PAA is nominated by the Prime Minister on request of MoC (Art.109.2). In accordance with Article 113 of ALA MoC grants the Statute of PAA, specifying its internal organization. In the past practice, the minister supervising PAA President always granted the Statute of PAA at the request of PAA President 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 PAA President by virtue of an ordinance (see Fig. 5).

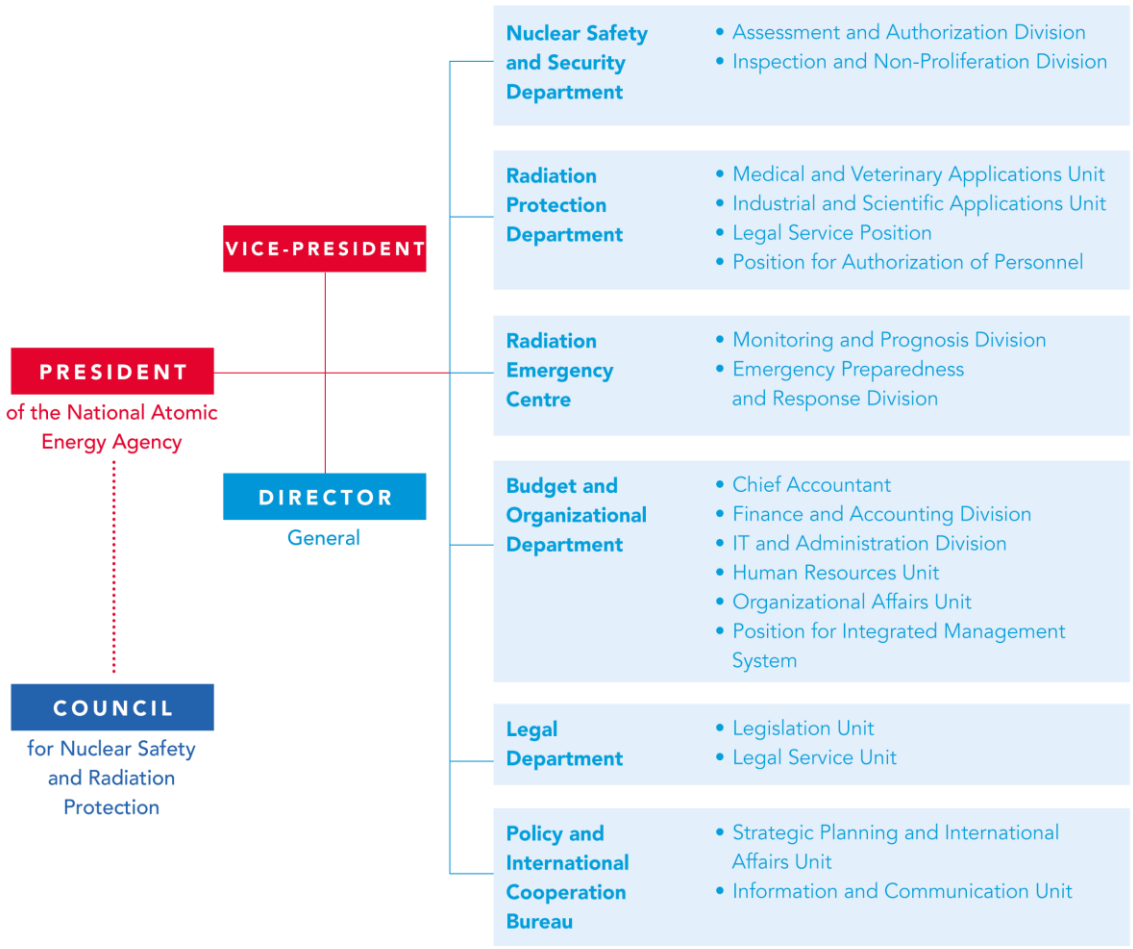

Fig. 5. Organizational structure of the PAA

PAA President 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 installation 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 (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 PAA President, 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 self-assessment process which included an identification of the PAA needs in the Polish Nuclear Power Programme. 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 2011 analyses with regard to necessary organizational changes and development of the Staff was prepared. 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 trainings. In 2017 PAA two documents were prepared in PAA:

- "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.
- 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.

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 energy matters (pursuant to the Act on Governmental Administration Departments),
2. nuclear safety and radiological protection matters are within the scope of activities of PAA President (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 PAA President 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 energy.

In accordance with Article 109 of ALA, the minister competent for Climate matters supervises PAA President. PAA President 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 PAA President only in the above-mentioned cases specified in Article 109.2b of ALA. The minister competent for Climate matters, at the request of PAA President, 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 PAA President in nuclear safety and radiological protection matters.

Amendment of Atomic Law of 2011 introduced requirement that the PAA President 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 PAA President, who pursuant to Article 5 § 2.4 of the Code of Administrative Procedure (KPA) is treated as a minister. A party dissatisfied with the decision may apply to PAA President for reconsideration of the case (Article 127 § 3 of KPA). Decisions issued by nuclear regulatory inspectors as part of their proceedings may be appealed against to PAA President as the supreme nuclear regulatory body (Article 64.7 of ALA).

As a consequence, the party is entitled to an application for reconsideration of the case to the President of PAA or a complaint to the voivodship administrative court against decisions issued in the first instance by PAA President, and then a cassation appeal to the Supreme Administrative Court against the judgment of the voivodeship administrative court (Article 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 PAA President. The

independence of PAA President was confirmed by the IRRS mission, which took place in Poland in 2013 and 2017. In 2013, the report on this mission indicated that “The IRRS team believes that PAA has been established firmly as an independent regulatory body”.

Transparency in Regulatory activities and communication with the public

The basis for access to public information held by PAA is given by Article 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, 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 article 110 of the Atomic Law Act, PAA is obliged, generally, to conduct activities concerning public communication and technical and legal information concerning 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:

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

Moreover, PAA also publishes:

- annual safety assessments of the inspected nuclear facilities,
- inspection programmes,
- 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.

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 licence 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 Agency's President shall immediately publish the application with an abbreviated safety report in the Public Information Bulletin, in the section dedicated, along with:

1. information on the initiation of proceedings in response to the application for a license to build a nuclear facility,
2. information on the right to make submissions or observations,
3. information on how and where to make submissions or observations within 21-day deadline,
4. 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.

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 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 Twitter 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).

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.

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 PAA President. 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 by 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 by 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.

Radioactive Waste Management Plant located in Świerk has been established for conducting the activities involving radioactive waste management and spent nuclear fuel management, and - above all – for the activities ensuring permanent feasibility of radioactive waste and spent nuclear fuel disposal.

Human Resources

According to art.12 of Atomic Law Act and supporting Council of Ministers regulation (on the position important for nuclear safety and radiological protection and radiological protection inspectors, issued on 2.09.2016 OJ item 1513), in ZUOP and NCBJ there are following specializations, important for ensuring nuclear safety and radiological protection which may be occupied by the individuals possessing an appropriate authorizations issued by the PAA President:

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 Atomic Law Act requires from the organizational entity in which radioactive waste or spent nuclear fuel is generated to be responsible for ensuring the possibility of managing radioactive waste and spent nuclear fuel, including ensuring financing of this procedure, from the moment of its creation until its delivery to storage, including financing for storage.

ZUOP`s financial resources available to support safety of the facilities for spent nuclear fuel and radioactive waste management are as follows:

- state budget through the budget of MoE;
- service activity of ZUOP;
- special provision of the state budget in case of unpredictable waste for example orphan sources.

The available financial resources are sufficient for routine activity of ZUOP.

National Plan of Management of Radioactive Waste and Spent Nuclear Fuel mentions about financial resources enable to support safety of closure of the repository. All financial resources will be derived from the Multiannual Plan for the Closure of the repository in Różan and construction a new radioactive waste repository. Multiannual Plan will be set out by The Council of Ministers through an application of MoE. The financial support for these purposes

should be available from state budget when decommissioning of the facilities or closure of the repository is going to be implemented.

According to the nuclear law, 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 licence for operating nuclear facility (art. 38g). NCBJ submitted during application for new license in 2015 documents confirming that NCBJ has sufficient financial resources.

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 Article 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 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. System meets IAEA safety requirements No. GS-R-3. Documentation describing the System was approved by the PAA. Functioning of the System is periodically controlled and assessed both by PAA and MoE. Since March 2017 the Statute of ZUOP includes information that all the activities in the Plant are covered by Integrated Management System.

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 Facility 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.

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,
- export outside the MARIA reactor facility.

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 41 workers in ZUOP classified into category A and 10 classified into category B (June 2020). Occupational exposure assessment is based on control measurements of individual doses or on dosimetric measurements in the workplace. The radiation protection rules imposed by law, in particular those observed in assigning workers to A or B categories, as well as dose limits are described in Annex VII.

Exposure assessment for category A workers is based on systematic individual dose measurements and, if such workers may be exposed to radiation from internal contamination having an impact on the level of effective dose for this category of worker, such workers are also subject to internal contamination measurements.

Exposure assessment for category B workers is based on dosimetric measurements in the workplace, performed in the manner which allows verification that they should belong in this category.

Regular monitoring of radiation was performed with use TLD dosimeters. In the last 3 (2017-2019) years the average of individual dose equivalents registered were below detection value (0,4 mSv). Only in few cases this value was exceeded[4]. None of the workers receive an annual dose limit. The environmental monitoring within and outside the Świerk and the NRWR Różan boundaries includes the measurements of direct or stray radiation due to the operation of nuclear facilities (reactors, accelerators, spent fuel and waste management facilities) and the measurement of radioactivity in samples of air, river and underground water, soil and vegetation. For a few last years the results of measurements has shown that there is no registered influence on environment and the population in the vicinity of Świerk Centre and NRWR due to the operation of its facilities. More information about radiation protection rules and dose limits in Poland is described in 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:

- individual control of employees,
- ongoing control of the work environment,

[4]There have been fourteen employees, who exceeded annual dose in the range from 0.4 to 1.1 mSv

- 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.**

The plans on different levels (facility level, province level, national level) and appropriate emergency preparedness arrangements have to be prepared and maintained by the organizations and bodies responsible for directing actions aimed at eliminating the threat and its consequences, and in particular - for implementation of intervention measures in case of radiation emergency with consequences beyond the site where it has occurred. The same bodies are responsible for systematic testing of these plans and arrangements within the prescribed time-intervals as established by the Atomic Law for national level (Art.96).

There are emergency plans for spent fuel and radioactive waste management facilities located at Świerk site and for the National Radioactive Waste Repository in Różan. The plans include internal (radiation protection and decontamination service) and external communication and cooperation (PAA President, Province Governor office and services, State Regional Sanitary Inspector, police, fire-department).

Within two years from the entry into force of the last amendment to the Atomic Law Act (transitional period), it requires to introduce changes to the emergency response plans. The main change of the Atomic Law (in Art.86i) is the determination of the general scope of the emergency response plan , as a consequence there is no longer any pattern for the plans. 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 response plan, and the emergency response plan and hazard analysis is one of the elements which are part of the radiation emergency management system. The scope will be divided to following areas: tasks associated with preparation for response, tasks associated with responding and tasks associated with handling the existing exposure resulting from radiological emergencies. Moreover, the amendment introduces hazard categorization, according to which a radioactive waste repository will belong to hazard category II - activities associated with exposure to ionizing radiation, which on-site radiation emergency results or may result with stochastic effects of exposure of members of the public off the site, justifying implementation of urgent protective measures. This obliges the head of the organizational entity to agree on the draft plan with the governor of a province, the Regional Fire Brigade Commander and the Regional Police Commander. In addition, the new regulations impose an obligation on the head of the organisational entity to take into account the conclusions of the hazard assessment during drawing up the emergency response plan, and to submit the hazard analysis and plan to the province governor. Therefore, the described amendment to the law imposes an obligation on spent fuel and radioactive waste management facilities located at Świerk and for the NRWR to amend their plans in accordance with the new scope and on the basis of a hazard assessment. The Atomic Law Act requires that during on-site radiation emergency, the actions aimed at the elimination of the threat and its consequences shall be directed by the facility head. During radiation emergency on regional scale actions including intervention measures shall be directed by the governor of a province (Voivode) in co-operation with the proper State Regional Sanitary Inspector. On national level this is responsibility of the minister of internal affairs, with the PAA President`s assistance.

According to present requirements (Art.96 of Atomic Law) the frequency of testing of the relevant plans at regional (provincial) and facility level must be established within each particular plan by the province governor or the head of the organizational entity respectively. Minimum testing frequency is once every 3 years at regional (provincial) level, once every year at facility level for entities belonging to threat category I or II(test including cooperation with external emergency teams at least once in 3 years)and once every 2 years for entities belonging to threat category III or IV. Minister of internal affairs is obliged by Law (Art.96.2 of Atomic Law) to perform exercise to test the national emergency plan at least once every 3 years. According to the new regulations, in the case of organisational units in hazard category II (such as radioactive waste repository), exercises to test all scenarios described in the emergency plan shall be carried out at least once a year, and including external emergency teams once every 3 years.

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 threat 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 PAA President is responsible for performing tasks concerning the assessments of national radiation situation in normal conditions and in radiation emergency situations, and the transmission of relevant information to appropriate authorities and to 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 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 ahead 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 laboratory class I, laboratory class Z and shredding unit are located in this building. For that reason there is no plan for the implementation of the stage 3 of decommissioning.

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 PAA President. 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:

1) the generation of radioactive waste at the lowest reasonably achievable level in terms of volume, activity and radioactive concentration;

2) 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 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 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 Article 37e of the Atomic Law head of the organizational entity shall perform periodical safety review. The exact time interval will be established in the license but should not exceed 10 years. Detailed periodical safety review plan needs to be approved by the PAA's President. Based on the periodical safety review, the head of organizational entity shall draw up a periodical safety review report to be submitted to the Agency's President 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 periodical safety review of a nuclear facility provides for a detailed scope of this review and a scope of periodical assessment report. The assessment should include inter alia review of design solutions, status of SSCs, 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 viewpoint of nuclear safety, radiological protection, physical protection and nuclear material safeguards, the Agency's President 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.

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 Atomic law 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 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 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.

All of the provisions are in line with principles specified in Article 6 of the Joint Convention.

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.

At the design stage the technical provisions for the decommissioning of spent fuel management facility will be taken into account.

The technologies incorporated in the design and construction will be developed with the assistance of experienced specialists and supported by testing and analysis.

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 PAA President, 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.

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 submitted to PAA in June this year. PAA staff reviewed and assessed the application and sent to NCBJ request for additional information. Currently, PAA is reviewing the answers of the operator.

Decommissioning programmes and the prognosis of the costs of decommissioning for spent nuclear fuel storage facilities No. 19 and 19A were submitted to PAA in August this year. PAA is currently performing safety assessment of the application.

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 Atomic Law Act the radioactive waste management activities as well as the relevant facilities have to be licensed by the PAA President.
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 radioactive waste management as well as will be able to fulfill the requirements related to particular facility or activity, included in the license conditions.

In particular the general radiation protection standards and the radioactive waste safety requirements provided in the Chapters 3, 4 and 7 of the Atomic Law Act (see Annex V) and also provisions of the Council of Ministers regulation on radioactive waste and spent nuclear fuel, have to be fulfilled. This regulation defines 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 imposed on various types of repositories and their siting, operation, construction and closure.

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

of. Tight cooperation between waste generators and ZUOP in the field of developing and following limits and conditions included in safety case are aimed to final dispose of radioactive waste in a safety manner.

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 about the releases is included in the previous National Reports.

Since the last JC review meeting from 2017 to 1st quarter of 2020, the tritium concentrations varied (depending on the seasonal and meteorological changes) from 2800 to 9388 Bq/dm^3 in the piezometer located directly nearby the facility No. 2 (potential source of release). It should be added that since 2015 the tritium concentration in this point systematically decreases.

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 connected with siting of radioactive waste disposal are established in art. 53a, 53b, 53c, 53d of Atomic law and supporting Council of Ministers regulation on radioactive waste and spent nuclear fuel.

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 regular general information on the safety available to members of the public according to art. 55n of Atomic Law Act.

All of the provisions are in line with principles specified in Article 13 of the Joint Convention.

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 Atomic Law Act and secondary legislation the technical criteria and requirements regarding the design and construction of radioactive waste management facility include provisions for suitable measures to limit possible radiological impacts on individuals, society and the environment.

At the design stage the technical provisions for the decommissioning of radioactive waste management facility will be taken into account.

The technologies incorporated in the design and construction will be developed with the assistance of experienced specialists and supported by testing and analysis.

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 perform appropriate safety assessments of a radioactive waste management facility to be constructed or operated and to submit the relevant safety documentation to the PAA President, is prerequisite to obtain the relevant licenses for this stages. More information about 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 Repository for Radioactive Waste in Różan have appropriate valid operating licenses, 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. According to art. 52 of Atomic Law Act the license include operational limits and conditions. Operation, maintenance, monitoring, inspection and testing programmes are performed by the facilities' Operators and relevant reports are regularly submitted to the PAA`s Nuclear Safety and Security Department for review. Engineering and technical support is provided if necessary. Operating experience is documented and reported to the PAA. Incidents are notified through established emergency channels. In accordance with art. 55j the head of 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 updated safety report for final closure of the repository which will be prepared by ZUOP, time scale for institutional control, as well as, post-closure activity will be established. Post-closure safety report defines the scope of this activity. The obligation of Article 17 of the Convention have been also 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 Atomic Law Act and 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 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 regulate

all issues connected with transboundary movements and implementing relevant European Commission directives.
Shipments of the SNF to the Russian Federation, which have been described in more detail in Sections B and D of the Report, have been performed in accordance of 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.**

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 had been used in Poland and cannot be returned to the foreign manufacturer form the 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 continued working on the following challenges which were identified during the last meeting:

- Effective implementation of the National Plan for management of RW and SF – ongoing, draft of updated National Plan prepared, see Annex I,
- Plans for closure of the Różan Repository – ongoing, rescheduling the task, see Annex I,
- New repository for L&ILW – choice of location by 2018 preceded by detailed research, construction by 2023, operation by 2025 (schedule depends on the updated National Plan) - draft of updated National Plan prepared, rescheduling the task, see Annex I,
- Site selection for Polish Underground Research Laboratory and selection of the site for deep geological repository - rescheduling the task, see Annex I,
- Continuing to ensure Regulatory Body maintains adequate resource levels in light of a significant new build programme – ongoing, see 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, MoE**
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 2020

1. The Polish Nuclear Power Programme (PPEJ).

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

Delays in anticipated progress in PPEJ are noticed therefore the MoE is preparing its update. The updated PPEJ should be adopted by Council of Ministers by the end of 2020. By the update Poland intends to build by 2040 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 way of the Regulation of 27 August 2009, set up a Team responsible for drafting the National Plan of Radioactive Waste and Spent Nuclear Fuel Management (hereinafter referred as to Plan). The Team was created of representatives of Government agencies and institutions responsible for the management of radioactive waste and spent nuclear fuel. The Team members state 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 basic task, in addition to defining methods of management of radioactive waste coming from different types of activities, is to define the method of management of spent nuclear fuel, as well as guidelines and recommendations on further work in this area (recommendations on the type of fuel cycle, including reprocessing option in Poland). The Team has prepared 12 analyses, necessary for the preparation of the draft of Plan.

The team has prepared, among others, evaluation of real costs of adopting various management methods for the 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.

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

- Design, construction, operation and closure are in compliance with the most stringent nuclear safety rules;

- 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;
- application of the "polluter pays" principle;
- use at all stages of radioactive waste and spent nuclear fuel based on evidence and documented decision making process;
- use an open fuel cycle - until the rise of economic and technical conditions for the introduction of a closed cycle;
- monitoring of storage and transport of radioactive waste and spent nuclear fuel;
- 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;
- the right approach to radiation hazards and emergency response and crisis management - in line with international standards;
- continuity of personnel training and guarantees its safety in the management of radioactive waste and spent nuclear fuel;
- developing training and information activities;
- transparency of activities and public information policy;
- providing public participation in decision-making;
- cooperation with international organizations and institutions involved in the management of radioactive waste and spent nuclear fuel;
- the using of the latest achievements of science and technology in the field of radioactive waste and spent nuclear fuel.

The Team, after consideration of the costs and benefits of the two possible solutions (reprocessing the spent nuclear fuel or without it, as well as ultimately, final disposal of all the spent fuel in deep geological repository within the territory of Poland), has recommended for Poland open fuel cycle. It was much cheaper for country with nuclear programmes as Poland (construction of two NPP). This option is also recommended for embarking nuclear energy countries like Poland by IAEA.

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.

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.

The MoE prepared the draft of update of National Plan and it should be adopted by the Council of Ministers to the end of this year. Updated National Plan makes the data of activities more realistic and connected with update of Energy policy up to 2040 and update of Polish Nuclear Power Program.

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:

- preparations for closing, final closing and long-term monitoring of the National Radioactive Waste Repository (NRWR) in Różan;
- selection of a location, construction and commissioning of the new surface radioactive waste repository(NSRWR);

- preparation for the construction of the deep radioactive waste repository (DRWR) - including implementation of the Polish Underground Research Laboratory (PURL) program;
- start-up of the DRWR before decommissioning of the first Polish nuclear power plant;
- modification of rules for radioactive waste management, including radioactive waste originating from nuclear energy industry;
- modification of the financing system for radioactive waste management, based on the "polluter pays" principle;
- creation of a development-and-research program concerning management of radioactive waste and spent nuclear fuel;
- 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 will be completely filled as early as about 2035, 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 Programme and National Plan. The draft of update National Plan provides following stages for realisation 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 is now running activities associated with obtaining public acceptance for detailed research and provide the research of 4 new potential sites in cooperation with National Environment Found. The research should finish in 2021.

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. According to the estimates made by the Radioactive Waste Management Plant (ZUOP), the NRWR in Różan will be completely filled as early as about 2035, with the proviso that the Różan repository 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:

1. Selecting the method of closing NRWR in Różan and execution of safety reports for its continued operation, closure and after closure period,
2. Preparation of the concept of closure NRWR in Różan,
3. Preparations for the closing, preparation of the repository closure program and obtain a permit to close,
4. Discontinue of delivering of radioactive waste,
5. Preparation of a report from the closure of the repository, to obtain a decision approving the report of the PAA President,
6. 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:

1. For the localization process of deep repository unrelated PURL, without taking into account the possibility of adapting the existing facilities.
2. For the localization process of deep repository unrelated PURL, including the possibility of adapting the existing facilities on the PURL.
3. 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 Working Group for create of European Repository Development Organisation and in the Salt Club, co-operative project with the USA, Germany

and the Netherlands. At the moment of issuing of this annotation, the initiative has been presented to the Integration Group for the Safety Case, 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.

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 medium 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 medium 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.

MoE was provided in years 2011-2013 first phase of Information and education campaign.

Activities undertaken within the frames of campaign were provided on two levels:

- national
- 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.

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 :

- transport of EK-10 took place in 2012,
- cost of transportation was covered by the USA,
- 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 now 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:

1. 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.
2. 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:

1. Develop a detailed concept for financing the management of radioactive waste in Poland, including coming from nuclear power,
2. 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^{5}
Er-171	10^{6}	10^{4}
Tm-170	10^{6}	10^{3}
Tm-171	10^{8}	10^{5}
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 1961-31.12.2019

No.	Isotope	Activity on 31.12.2019 [GBq]	Initial activity [GBq]
1	Cs-137	19 713.0	35 693.9
2	Sr-90	6 556.9	8 687.0
3	Am-241	5 532.3	5 680.1
4	Pu-239	4 465.5	4 468.6
5	H-3	3 929.3	8 966.2
6	Co-60	3 087.2	62 029.9
7	U-238	1 262.2	1 262.2
8	Pu-238	839.1	979.1
9	Ra-226	722.8	731.9
10	C-14	538.9	540.9
11	Kr-85	470.4	1 195.8
12	U-236	153.5	153.5
13	Se-75	98.8	96 073.9
14	Ni-63	73.7	83.3
15	Eu-152	31.6	215.6
16	Cm-244	31.0	47.5
17	Th-232	28.6	28.6
18	Pm-147	23.5	261.9
19	Ir-192	14.2	204 678.3
20	Th-230	13.6	13.6
21	Eu-154	10.8	208.5
22	S-35	8.1	15 983.6
23	K-40	7.6	7.6
24	Cl-36	5.7	5.7
25	Pb-210	3.1	17.2
26	Ge-68	2.8	10.6
27	Fe-55	1.9	30.0
28	Pm-145	1.8	5.0
29	U-235	1.4	1.4
30	Cs-134	1.2	240.4
31	Tl-204	1.2	319.8
32	Ba-133	1.0	1.9
33	Te-121m	0.9	148.1
34	Sb-125	0.8	22.2
35	U-233	0.7	0.7
36	Np-237	0.5	0.5
37	Te-123m	0.3	621.9
38	Te-127m	0.2	267.0

39	Co-57	0.2	10.8
40	Mn-54	0.2	65.0
41	Tc-99	0.1	0.1
42	Ru-106	0.1	153.5
43	Zn-65	0.1	1 900.4
44	Cf-252	0.1	4.6
45	Na-22	0.1	2.4
46	Ce-144	0.1	1 597.2
47	I-125	0.0	27 042.8
48	Po-210	0.0	5 893.1
49	P-32	0.0	2 175.0
50	Yb-169	0.0	2 160.6
51	Cr-51	0.0	1 751.6
52	Y-90	0.0	613.6
53	I-131	0.0	344.7
54	Nb-95	0.0	343.6
55	Ce-141	0.0	323.8
56	Na-24	0.0	275.1
57	Te-127	0.0	267.3
58	Zn-69	0.0	262.9
59	Lu-177	0.0	242.2
60	Tc-99m	0.0	214.5
61	Zr-95	0.0	185.2
62	Mo-99	0.0	162.8
63	Fe-59	0.0	145.2
64	Te-121	0.0	135.3
65	Tm-170	0.0	129.2
66	Cm-242	0.0	111.0
67	Sb-124	0.0	68.5
68	Sr-89	0.0	55.7
69	Sn-113	0.0	49.5
70	Ca-45	0.0	31.1
71	Ru-103	0.0	24.9
72	Ag-110	0.0	20.3
73	Lu-172	0.0	18.0
74	Sc-46	0.0	15.2
75	I-123	0.0	11.2
76	Co-58	0.0	9.9
77	Re-188	0.0	6.3
78	Cd-109	0.0	6.1
79	Cu-64	0.0	6.0
80	Rb-86	0.0	5.8
81	Ir-190	0.0	5.6
82	Hf-181	0.0	5.3
83	W-188	0.0	4.2

84	Sb-122	0.0	3.3
85	La-142	0.0	3.2
86	Sr-85	0.0	2.0
87	Kr-88	0.0	1.9
88	Ba-140	0.0	1.9
89	Kr-90	0.0	1.9
90	La-140	0.0	1.6
91	Lu-166	0.0	1.5
92	Gd-153	0.0	1.3
93	Hg-203	0.0	1.1
94	Ta-182	0.0	**1.0**
95	others	0.0	10
96	**Total**	**47 637.2**	**496 572.0**

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 29 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 20Chapters:

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 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.

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 prohibition of use these materials and technologies to construct nuclear weapon or nuclear explosives; any scientific researches in this area are subject to notification to the PAA President prior 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 wastes, states the responsibilities of the head of the organizational entity which is handling wastes, and addresses the questions of wastes disposal and of the necessary protection of humans and of the environment. During last amendment new provisions referring to siting of radioactive waste repositories were introduced. Now it is formally required that applicant must prepare safety analysis report containing evaluation of the site in terms of its suitability and way that a legal safety requirements are fulfilled. It also regulates responsibilities of minister competent for energy matters 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 procedure of licensing 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 inspectors of the regulatory body. 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 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 which 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, wojewoda (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 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" states that the Ministry competent in Energy matters is responsible for developing of nuclear energy and preparing as well as periodical uploading of the Polish Nuclear Power Program.

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) through the National Atomic Energy Agency, statute of which is to be issued by the MoC. Council for Nuclear Safety and Radiological Protection act as the consulting and opinion-giving body of the President of 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, who provides the plant with a statute. This chapter specifies, inter alia, that the utility receives 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 the cases when the exposure to ionizing radiation are exempted from mandatory licensing or notification, and on the cases when such activities can be conducted on the basis of a notification, issued on 06.08.2002 OJ (Dz. U. 2002) No.137, item 1153, in force since 13.09.2002 (amended 2004);
- 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 amendments to regulation on exemption of certain practices from the obligation to apply for license, or from reporting obligations (Art.6.1), issued 27.04.2004 OJ (Dz. U. 2004) No. 98 item 980, in force since 01.05.2004 - amends existing regulation OJ (Dz. U. 2002) No. 137 item 1153, issued on 06.08.2002);
- Council of Ministers regulation on the values of intervention levels for particular types of intervention activities and levels for their cancellation (Art.87.3), 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 (Art.97.4), issued 27.04.2004 OJ (Dz. U. 2004) No. 98 item 988, in force since 01.05.2004;
- Council of Ministers regulation on radiation protection of external workers exposed in controlled areas (Art.29.3), issued 27.04.2004 OJ (Dz. U. 2004), No. 102 item 1064, 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 (Art.92.4), issued 27.04.2004 - OJ (Dz. U. 2004) No. 102 item 1065, in force since 01.05.2004.

2005

- Council of Ministers regulation on ionizing radiation dose limits (Art.25.1), issued 18.01.2005 OJ (Dz. U. 2005) No. 20 item 168, in force since 18.02.2005;
- Council of Ministers regulation on the national emergency preparedness plan and the patterns of facility and regional emergency preparedness plans (Art. 87 p.1 i 2) issued 18.01.2005 OJ (Dz. U. 2005) No. 20 item 169, in force since 18.02.2005 (amended 2007);

2006

- Council of Ministers regulation on detailed conditions for safe handling of radiation sources, issued on 12.07.2006, OJ (Dz. U. 2006), No. 140, item 994, in force since 21.08.2006;

2007

- Council of Ministers regulation on natural radioactive isotope content in specified materials and industrial waste used in the buildings and in construction industry, as well as on controlling of the content of such isotopes, issued on 02.01.2007, OJ (Dz. U. 2007), No. 4, item 29, in force since 25.01.2007;
- Council of Ministers regulation on amendments to regulation on the national emergency preparedness plan and the patterns of facility and regional emergency preparedness plans (Art. 87 p.1 i 2) issued 20.02.2007, OJ (Dz. U. 2007), No. 131, item 912, in force since 7.08.2007;
- Council of Ministers regulation on requirements for individual dose registering, issued on 23.03.2007, OJ (Dz. U. 2007), No. 131, item 913, in force since 07.08.2007;
- Council of Ministers regulation on the requirements for controlled and supervised areas, issued on 20.02.2007. OJ (Dz. U. 2007) No. 131, item 910, in force since 07.08.2007;
- Council of Ministers regulation on the terms for import into the territory of the Republic of Poland, export from the territory of the Republic of Poland and transit through this territory of nuclear materials, radioactive sources and equipment containing such sources, issued on 20.02.2007. OJ (Dz. U. 2007) No. 131, item 911, 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.

2010

- Council of Ministers regulation on amendments to regulation on the allocated and special purpose subsidy, fees and finance management in the state-owned public utility 'Radioactive Waste Management Plant', issued on 18.10.2010, OJ (Dz. U. 2010) No. 205 item 1355, in force since 3.11.2010.

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. 2012) item 43, 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. 2012) item 394, in force since 13.04.2012;
- Council of Ministers regulation on nuclear regulatory inspectors, issued on 24.08.2012, OJ (Dz. U. 2012) item 1014, in force since 28.09.2012 (amended 2016);
- 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;
- Council of Ministers regulation on the allocated and special purpose subsidy, fees and finance management in the state-owned public utility 'Radioactive Waste Management Plant', issued on 29.04.2013, OJ (Dz. U. 2013), item 574, in force since 1.06.2013.

2015

- Council of Ministers regulation on documents required for license application submitted for practices that involve or could involve radiation exposure or for the notification of such practices issued on 30.06.2015, OJ 2015, item 1355, in force since 1.01.2016;
- Council of Ministers regulation on radioactive waste and spent nuclear fuel, issued on 14.12.2015, OJ 2015, item 2267, 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.

2016

- Council of Ministers regulation on the position important for nuclear safety and radiological protection and radiological protection inspectors, issued on 2.09.2016 OJ 2016, item 1513, in force since 21.09.2016.

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 standard form of identity document of nuclear regulatory inspector, issued on 9.11.2011, OJ (Dz. U. 2011) No. 257, item 1544, in force since 1.01.2012;
- 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 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 the minimal requirements for the health care units seeking the approval for activities involving medical exposure to ionizing radiation consisting in oncological radiotherapy services, issued on 7.04.2006, OJ (Dz. U. 2006) no 75 item 528, in force since 19.05.2006, its amendment No. 48/252 – 18.02.2011 in force since 15.03.2011 and 471 – 24.04.2012 in force since 8.05.2012;

- Minister of Health Regulation on organizational form, mode of operation and detailed tasks of the National Centre for Radiological Protection in Health Care, issued on 4.05.2006, OJ (Dz. U. 2006), No. 85 item 592, in force since 3.06.2006 and its amendment no. 35/180 – 24.01.2011 in force since 4.03.2011;
- 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. 2006), No. 1, item 11, in force since 20.01.2007;
- Minister of Health Regulation on detailed requirements for the form and content of the standard and working radiological procedures in medicine, issued on 2.02.2007, OJ (Dz. U. 2007), No. 24, item 161, in force since 1.03.2007;
- Minister of Health Regulation on the minimal requirements for health care units rendering health services consisting of X-ray diagnostics, interventional radiology, radioisotopic diagnostics and therapy of non-oncological diseases, issued on 27.03.2008, OJ (Dz. U. 2008), no 58, item 365, in force since 24.04.2008 and its amendment No. 48/253 – 18.02.2011 in force since 15.03.2011;
- Minister of Health Regulation on the organizational framework for radiological database, issued on 27.03.2008, OJ (Dz. U. 2008), No. 58, item 366, in force since 24.04.2008;
- 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;
- Minister of Health Regulation on the conditions for safe use of ionizing radiation for all types of medical exposure, issued on 18.02.2011, OJ (Dz. U. 2011) No. 51 item 265, in force since 17.03.2011, and its amendment item 470/2012 in force since 24.04.2012;
- Minister of Health Regulation on granting authorizations for radiological protection inspectors in laboratories using X-ray devices for medical purposes, issued on 21.12.2012, in force since 1.01.2013;
- Minister of Health Regulation on training in the field of radiological protection of patients, issued on 6.03.2020, (Dz. U., item 390), 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;

<u>Regulation of the Minister of Climate:</u>

- 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;

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 23 March 2007 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 Świerk 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 Swierk, disposal in Różan Repository	New Near Surface Repository for SL DSSs; Deep Geological Disposal for LL DSSs