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 5th national report as referred to in Article 32 of the Joint Convention

July 2014

Contents

List of Acronyms

CNSRP – Council for Nuclear Safety and Radiation Protection

GTRI – Global Threat Reduction Initiative

HEU – Highly Enriched Uranium

IAEA – International Atomic Energy Agency

ILW – Intermediate Level Waste

IPPA – Project on Implementing Public Participation Approaches in Radioactive Waste Disposal

LEU – Low Enriched Uranium

LLW – Low Level Waste

MoE – Ministry of Economy

NCBJ – National Centre for Nuclear Research

NPP – Nuclear Power Plant

NRA – Nuclear Regulatory Authority

NRWR – National Radioactive Waste Repository

PAA – National Atomic Energy Agency

RR – Research Reactor

RRRFR – Russian Research Reactors Fuel Return

RWMP – Radioactive Waste Management Plant

SF/SNF – Spent Fuel/Spent Nuclear Fuel

SFA – Spent Fuel Assembly

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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 fifth one, following the previous four national reports, issued respectively in May 2003, October 2005, October 2008 and October 2011, 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 and May 2012, 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 related to implementation of GTRI program, changes of the legislative framework- implementing into the national laws the provisions of Council Directives: 2009/71/EURATOM and 2011/70/EURATOM- and regulatory control infrastructure, 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 fourth review meeting to be addressed in the Polish 5th national report.

Facilities concerned

Poland never had neither any nuclear power reactor nor any nuclear fuel cycle facility, except uranium mine, in operation[1]. 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 3000 institutions. The most important of them in terms of generation and management of radioactive waste and spent fuel have been the facilities described in the Annex 1.

Radioactive waste of low and medium activity, produced in Poland, is collected, processed, solidified and prepared for disposal by the State-owned public utility “Radioactive Waste Management Plant” – RWMP. RWMP is situated in Świerk site (30 km from Warsaw). Subsequently the waste is disposed in the National Radioactive Waste Repository (NRWR) in Różan site, operated also by the RWMP. The repository - which came into operation in 1961 - is a near surface type repository, located 90 km from Warsaw on the grounds of an ex-military fort built in 1905. According to present expectations, this repository, which is the only one in Poland, is foreseen to be completely filled by 2025. Currently also alpha radioactive waste and small amounts of nuclear material (mainly depleted uranium) is temporarily stored in Różan.

RWMP has been performing its activities under the auspices of Ministry of Economy.

[1] The project of the first NPP, planned at Żarnowiec (two units of WWER-440/V213 – construction started in 1985) was abandoned in 1990. No other nuclear power projects have been commenced, however the nuclear option, based on advanced power plant technology (as stated in the relevant decision of Parliament), has been kept open since that time. According to recent national electricity supply development plans the first NPP is expected to be put in operation around the year 2024.

Spent fuel from research reactors may be stored either at reactor (in case of SF from MARIA RR) which is operated by the National Centre for Nuclear Research NCBJ in Świerk site, or away from reactor, in 2 separate wet storage facilities. Decommissioning activities of EWA RR attained the end of their 2nd stage. Both of these 2 separate facilities are sited at nuclear research centre in Świerk and operated by the RWMP, where also waste treatment and storage facilities for ILW and LLW are located. High activity spent sealed sources are also temporarily stored in RWMP facilities in Świerk. The conditions at the storage facilities are monitored by the users - either by the NCBJ or by the RWMP, and is under regulatory control of National Atomic Energy Agency PAA, which is the national nuclear regulatory authority (NRA) in Poland.

Fig. 1. Nuclear sites in Poland.

Main aspects overview

According to the plans which have been valid up to 1991, spent nuclear fuel from research reactors was to be returned to the manufacturer, in that case - the former Soviet Union. In recent years the major part of SNF has been safely shipped to the Russian Federation under the GTRI – RRRFR Program with the US Government support.

In April 2008 Council of Ministers obliged Minister of Economy to prepare National Plan of Management of Radioactive Waste and Spent Nuclear Fuel - document describing

new national strategy regarding radioactive waste management and spent fuel management. More information about this document is given in Annex 2.

A 2 major amendments of the Atomic Law due to implementation of EURATOM Council Directives 2009/71 and 2011/70 have been performed in recent years, which influenced regulation upon RW/SNF. More detailed information is given in further Sections and Annexes of the document.

According to last changes in INFCIRC/604, this section should also focus on good practices and challenges identified in radioactive waste and spent fuel management since last report.

The following good practices were identified:

- Adoption by the Council of Ministers the Polish Nuclear Power Programme (see Annex 2);
- Organizational frame of the Polish Underground Research Laboratory PURL (see Annex 2);
- Strengthening regulatory system – developing nuclear legislation and regulatory guidance regarding siting of nuclear facilities (see section E), employment new people and their training.

The following challenges were identified:

- Closure of the Różan Repository – selection of the concept (include the results of GSP performed in 1997-1999, see Section B) and preparing safety reports (see Annex 2);
- Site selection of PURL (see Annex 2);
- Continuation of works connected with siting of new radioactive waste repository for LLW and ILW (see Annex 2);
- Preparing the National Plan of Management of Radioactive Waste and Spent Nuclear Fuel (see Annex 2).

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 of Ministry of Economy,
- Radioactive Waste Management Plant,
- National Centre for Nuclear Research NCBJ in Otwock-Świerk.

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.**

General overview

First steps towards achieving the goal of providing a national strategy for safe and secure maintenance and management of spent nuclear fuel and radioactive waste were undertaken by launching the Governmental Strategic Programme “Radioactive Waste and Spent Fuel Management in Poland”. Performed in the years 1997-1999, the Programme (referred further to as SGP) consisted of 9 mutually interlinked undertakings as well as 4 research and development projects, and resulted in the following developments in 6 areas of interest highlighted below:

1. Legislative work

The result was preparation of regulations (on the level of parliamentary bill and that of executive regulations) on the management of radioactive waste and spent nuclear fuel in accordance with the EU requirements and IAEA guidelines, as well as with the Joint Convention requirements issued in the year 2002, most of which remain in force. Moreover, the work resulted in creation of legislative framework enabling to provide changes in an organizational system for waste management in conformity with the European standards.

2. Closure conception of Różan repository

The purpose of this undertaking was to elaborate variant closure conceptions of Różan repository. Six closure conceptional variants of the current disposal facility in Różan has been prepared, where the basic one involved a multi-layered soil cover, a concrete cap and a partial or total evacuation of collected waste. Appropriate safety and environmental impact assessments have been performed. The choice of variant and the realisation of the chosen conception will be done after reassessing the results of performed analysis and after the decision on the repository closure is made. This decision depends on the technical possibilities of site operation and on the further acceptance of local community. According to the capacity and waste amounts analysis, the operation of Różan repository should be possible up to the year 2025, provided that all safety conditions be fulfilled.

3. Conception of further management of spent fuel from Polish research reactors

The State-established investigation on some chosen spent fuel elements used in EWA and MARIA research reactors showed that their long-term storage in water environment led to corrosion caused cladding surface degradation. In case of some fuel elements this process led to leaks of fission products into storage facility water environment. Using the results from spent fuel research, a more detailed conception for dry storage and construction of an encapsulation facility has been prepared (hot cell was completed in 2006), involving the building of decommissioned EWA reactor and some of its equipment[2]. Further actions regarding the dry storage were postponed due to development of RRRFR program within the GTRI initiative started in 2007 (first shipment of SNF was in 2009).

4. Siting activities for the near-surface repository for LLW and ILW.

As a result of these activities, 19 sites situated in 12 communes were chosen for geological research in situ. The selection of the most promising regions was performed. The acceptance of local authorities for siting the repository until the end of the project (1999) was not gained though, and therefore no progress in this area has been done up to recent period.

5. Siting activities for the repository in deep geological formations.

In the frames of SGP (1997-1999) the total number of 44 rock structures were chosen for preliminary analysis, comprising magmatic and metamorphic rocks, argillaceous formations and salt deposits. It was found that granite bedrock in Poland which were designated for possible research are not suitable for repository placing due to their extensive fracturing.

Two kinds of host rock are designated for further examinations:

- homogenous clay rocks in Przedsudecka Monocline, deposits of ca. 200 m thick,
- 3 salt domes (Damasławek, Łanięta and southern part of Kłodawa domes).

No further activities had been undertaken since that time until 2009.

6. Public information

The information for the public about radioactive waste management and safe storage was prepared in several forms, among others, the permanent exhibition "Radioactive waste problems and solutions", and the popular booklets, movies and lectures.

Conclusions of the SGP (1997-1999)

Strategic Governmental Programme: "Radioactive waste and spent fuel management in Poland", apart from resolving of several current problems of securing the continuity of safe and effective radioactive waste management, provided the basis for further decisions concerning the nuclear power programme. The fundamental question whether is it possible, in Polish conditions, to solve the problem of highly radioactive waste disposal was answered affirmatively.

[2] According to this conception, after removal of the reactor vessel, equipment and thermal column blocks and after cutting out the cast-iron supporting plate, a special separator with storing channels made of stainless steel could be installed in the shaft of the reactor concrete shield. In parallel, other technologies were studied, e.g. dry storage of NUHOMS type or CASCADE.

Possible methods of future solution of long-lived radioactive waste problem have been studied. The knowledge state of the art at this time permitted to conclude, that the transmutation method gives a far-sighted option for the solution of this problem as well as that rational continuation of further research on transmutation in Poland essentially will depend on the increase of research potential and on increased financial resources.

Recent Continuation in the RW/SNF Management Policy Making

In April 2008 Council of Ministers obliged Minister of Economy (in cooperation with Minister of Treasury – then supervisory body of Radioactive Waste Management Plant) to prepare a new national strategy document for radioactive waste and spent fuel management. The Minister of Economy by way of the Regulation of 27 August 2009, set up a Team that was responsible for drafting the National Plan of Management of Radioactive Waste and Spent Nuclear Fuel. The Team consists of representatives of Government agencies and institutions responsible for the management of radioactive wastes and spent nuclear fuel.

The draft of the Plan was prepared by the Team in May 2014. The prognosis of the National Plan's impact on the environment will be prepared followed by the next steps of the Strategic Environmental Impact Assessment Procedure, including public consultation. The Plan should be also adopted by the Council of Ministers and then its content shall be for the first time notify to the European Commission not later than 23 August 2015.

Scope of the document shall cover issues connected with:

-siting and construction of the new national radioactive waste repository for low and intermediate level waste (to be put in operation after closure of Różan repository ~ 2025),

-revitalization of works connected with siting of a deep geological repository for high level and long lived wastes,

-continuation of works connected with closure of Różan repository,

-aspects related with radioactive waste coming from nuclear power plants.

Meanwhile in 2009 there has been Government decision issued on embarking on nuclear power by introducing it through a strategy document Polish Nuclear Energy Program, containing basic provisions and frames for safe RW&SNF management.

Concerning the siting activities for the near-surface repository for low and medium activity waste recently the Ministry of Economy in cooperation with National Environmental Found has prepared a special project covering such issues as 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.

More details on the actions taken in the surface disposal management, preparing of the National Plan and RW&SNF policy as well as siting, are given in the Annex 2.

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 future nuclear programmes in Poland.

The safe, secure, stable and protected storage of spent nuclear fuel, after its unloading from the nuclear reactor or from the fuel pool at the reactor and before its handling over for reprocessing or for disposal as radioactive waste, is the responsibility of the Government, acting by means of dedicated governmental bodies (MoE) and public institutions (RWMP). The development of technologies and capacities for longer-term management, including final radwaste disposal within Polish territory, is also the responsibility of the Government and constitutes a primary goal of spent fuel management strategy (see Annex 2).

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 President of National Atomic Energy Agency. The implementation of the program started in 2009 and by the end of 2013 there had been 6 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.

During the period covered by this report, the sixth shipment of spent fuel to the Russian Federation has been held. The PAA President on the basis of documentation provided by the Radioactive Waste Management Plant issued in 2012 an authorization concerning carriage of spent fuel. The said license included among others the quantity and specification of shipped fuel and was issued in accordance with the Regulation of the Ministers' Council of 21 October 2008 on Licensing the Carriage of Radioactive Waste and Spent Nuclear Fuel in the Territory of the Republic of Poland and Transit Across this Territory. The operation of loading and transport of spent fuel was supervised by the PAA nuclear regulatory inspectors and the results of inspection confirmed required level of safety of that activity.

Two more shipments of highly enriched spent nuclear fuel to the Russian Federation are predicted: first in 2014 and second in 2016 after the suitable period for fuel cooling. The direct responsibility for transport rested with the Radioactive Waste Management Plant, whereas the PAA President granted authorizations regarding shipments and supervised their execution.

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 RR, 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).

From 1974 to 1998, MARIA RR was fuelled with uranium containing 80% U-235. Later, from April 1999 up to June 2002, there was transition period to fuel with lower U-235 enrichment (36%) which is still in use. In recent years, under the auspices of GTRI program, a conversion programme of MARIA RR to the fuel of LEU-type has been launched. In 2009, two test CERCA LEU fuel assemblies (MC-5) have been introduced, from which one was removed in 2010 after reaching 40% burnup, whereas testing of the second assembly has been finished in 2011 after reaching about 60% burnup. According to the tests results, the new fuel fulfills all the conditions and requirements for its exploitation, but is characterized by about 30% higher hydraulic resistance coefficient and ca. 25% less heat transfer surface in comparison with the fuel elements that have been used so far. It has emerged the need to increase the coolant flow rate through the reactor primary circuit in operation with LEU fuel. Therefore it was necessary to carry out the modernization of a cooling system of the reactor fuel channels, which has been completed in August 2013. After modernization, the LEU fuel was gradually introduced to the MARIA RR core. From September 2014 the MARIA RR will be operating exclusively with low enriched fuel (MC-5 type).

In 2013, two test Russian 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 one is still in.

SFAs and rods may be stored in two water ponds located in Świerk, being operated by RWMP (facilities no 19 and 19A) as well as in the MARIA RR pool. In the beginning of 2003, the encapsulation process of MR-6 MARIA RR spent fuel was commenced by its operator - the National Centre for Nuclear Research (NCBJ) in Świerk in course of preparation to dry storage.

To asses and develop this storage concept for SNF, EU PHARE Project entitled „Development of the technology and procurement of equipment for encapsulation of spent nuclear fuel from Polish research reactors" has been established. Its part related to encapsulation process of EK-10 fuel has been successfully completed and RWMP was granted with appropriate license on equipment and technology for encapsulation - construction and commissioning activities resulted in preliminary license for encapsulation of 3 capsules (Regulatory Body decision No 2/2006/ZUOP). After satisfactory outcomes of this testing phase, license for spent nuclear fuel encapsulation was issued – Regulatory Body decision No 1/2008/ZUOP of 3rd July 2008 and first batches containing elements with the longest wet storage record have been successfully encapsulated.

Hot cell used for encapsulation of spent fuel elements of EK-10 type is located in the EWA RR hall. Inner dimensions of the hot cell are as follows: length – 4,5 m, width – 3,0 m, height – 4,0 m, thickness of concrete shielding wall is 0,7 m. Shielding of the cell walls is sufficient for operations with 5 years cooled 1 MR6 type spent fuel assembly or 3 WWR type assemblies, or bundle of 50 EK -10 type rods as well.

Hot cell consist of two rooms: "dirty" (left) and "clean" (right), both of them are equipped with: 4 manipulators Master-Slave P-100 type, 2 shielding windows, welding machine, hot air drying channel, vacuum technological drying channel, 2 micro crane (capacity of 63 kg), cutting machine, tightness helium tester and computer data recording system as well.

The project was supported by State budget financing (design and construction of the hot cell as well as adaptation of former EWA reactor building for SNF encapsulation and dry storage), and was co-financed by European Commission within PHARE contract with German company BNN (Babcock Noell Nuclear GmbH).

The encapsulated SNF of MR-6 type (in amount of ca.160 SFA in the years 2003-2007) at this time has been placed back in the MARIA RR pool or transported to 19A RWMP

wet storage facility (96 SFA). Further encapsulation of spent fuel from MARIA RR was stopped in 2009 due to new opportunity created by RRRFR programme. All spent nuclear fuel of HEU type stored in facility 19A was sent to the Russian Federation in 2010 within the RRRFR Program (GTRI), which was supported by the USA Government.

In the year 2008 process of EK-10 fuel encapsulation was launched. By the end of 2009, total number of 2595 of EK-10 type spent fuel rods have been encapsulated into 90 stainless steel capsules.

Capsules tightness and dry atmosphere of inert gas (helium) enable to store the fuel rods by 100 or more years. However, according to Polish Government decision regarding financial support of LEU spent fuel shipping, encapsulated fuel rods EK-10 type was attached onto HEU Maria reactor SNF MR type and has been shipped in the frame of 6th shipping to the Russian Federation, using VPVR casks.

Table 1. Information about SNF shipments

Shipping No.	$U_{(tot)}$ [kg]	U_{235} [kg]	Pu [kg]
1	153,95	43,95	6,78
2	109,17	39,03	3,55
3	37,33	19,04	0,41
4	27,81	17,97	0,22
5	26,57	17,58	0,19
6	263,3	31,7	5,07

In the table above quantity of fusil materials shipped to Russian Federation so far. Next shipments in the years 2014 and 2016 will ended evacuation all HEU spent fuel from Poland.

Radioactive waste management policy

Management of radioactive waste, that means all practices involving processing, handling, storage and disposal of radioactive waste, including liquid and gaseous discharge of radioactive waste into the environment, is permitted after undertaking the measures defined in appropriate regulations, aimed at ensuring safety and protection of human life and health, as well as protection of property and environment. Collecting the radioactive waste after its handing-over by users, along with safe, secure, stable and protected interim storage, treatment and conditioning for disposal as well as final disposal of radioactive waste is the responsibility of the Government, acting by means of dedicated governmental bodies. The results of the Strategic Governmental Programme (1997-1999) led to the following conclusions and formulation of the policy goals:

- the operation of the present national radioactive waste repository in Różan should be continued as long as possible, provided that all safety conditions are fully addressed,

- the closure conception of the current disposal facility in Różan has been prepared,
- the selection of the most promising regions was performed with a prospect of siting a new near surface repository. As a result of the screening analysis, 19 sites situated in 12 communes were chosen for further onsite research. Efforts should be continued to obtain acceptance from the public and local authorities for repository siting, which was not gained within the time frame of the Programme,
- constant effort should be put in to upgrade waste management technologies which are presently in use; with regard to a future solution of long-lived radioactive waste problem, the transmutation method seems to be the most promising far-sighted option.

To achieve the goals related to Różan repository, EU Phare Project entitled "Improvement of storage conditions and closure of the National Radioactive Waste Repository-Różan" has been established and implemented in the years 2003-2004. General objective of the project was to increase the safety of the Różan repository and its further operation until 2025. Main efforts focused on the preparation of an updated safety report for renewal of the licence for the operational phase and the safety report for closure and post-closure repository phases. All reports have addressed the issue of the groundwater contamination by tritium and maybe, in the longer term, by other radionuclides. The scope of the project has been covered by the Tasks 1 ÷ 10 listed below. More detailed description of project implementation was given in the previous national reports.

- Task 1 – Review of existing safety documentation
- Task 2 – Establishing of an inventory of all types of radioactive waste currently stored and/or disposed of in the facility
- Task 3 – Determination of safety objectives
- Task 4 – Analysis of the variations of tritium concentration in ground water
- Task 5 – Development of technical specifications for the remediation of tritium releases
- Task 6 – Development of technical specification for a long-term monitoring programme
- Task 7 – Updating of the safety report related to the operation of the disposal facility
- Task 8 – Preparation of the safety report for the final closure of the facility
- Task 9 – Draft of the safety report for post-closure phase of the repository
- Task 10 – Finalisation of the safety reports after reviewing by the Polish stakeholders

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 handling of radioactive wastes. After collection and transport to Świerk Centre 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. 1. RWMP performs the collection, segregation, treatment, conditioning and interim 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 (NRWR) and the operation of this repository. The users are responsible for their proper segregation and categorization before they are collected by RWMP.

R&D in radioactive waste management area are performed by various research groups from the National Centre for Nuclear Research NCBJ and from other scientific institutes.

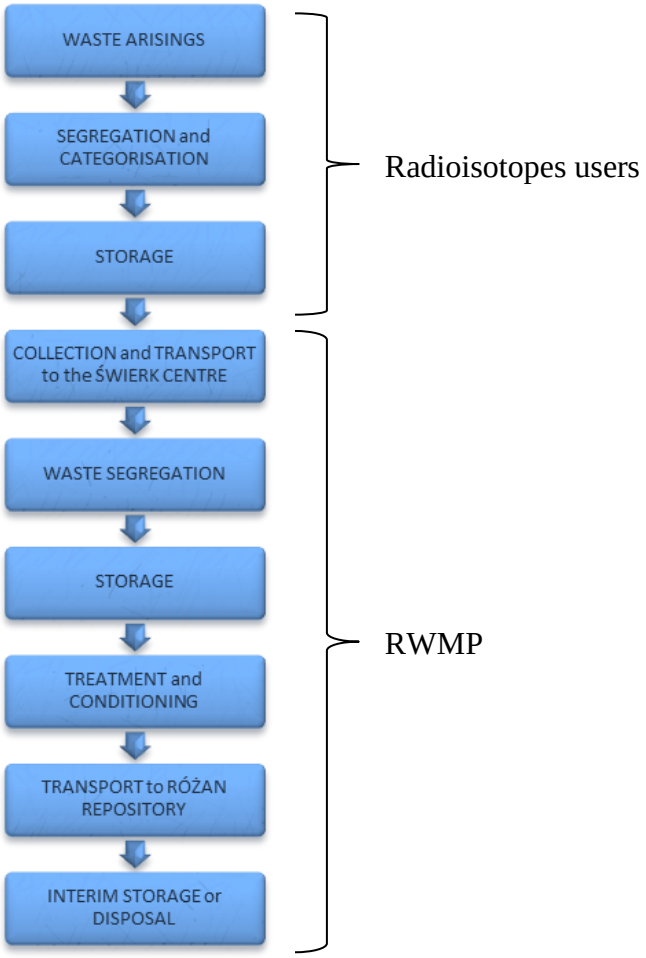


Fig. 2. The diagram of the radioactive waste management system in Poland.

Waste arisings

Radioactive waste comes from:

- research reactors - at present, there is one 30 MW_t reactor operating in Świerk Centre – MARIA RR (operated by the National Centre for Nuclear Research NCBJ). Except Maria RR, the first Polish research reactor – EWA was decommissioned to the 2-nd stage according to the IAEA classification, from which process were also some waste arisings contributing to the inventory.
- scientific and educational institutions, industrial organizations and hospitals. More than two 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 RWMP storage facilities in Świerk Centre.

Waste treatment and conditioning

The low-level liquid waste is treated with use of mixed synthetic inorganic sorbent composed of barium carbonate and copper ferrocyanide. Decontamination factor achieved

was 30. Precipitate obtained was further subjected to the cementation. Intermediate level waste, as well as waste arising from decontamination are evaporated and evaporator bottom is solidified with cement. The solid waste was sorted. About 60% of total volume of the waste was subjected to the bailing technique with use of hydraulic press. Volume reduction factors obtained were ranging from 3 to 5, depending on waste type. Ion-exchange resins were conditioned by dewatering and mixing with polyester resin. The solid and conditioned waste was 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.2.

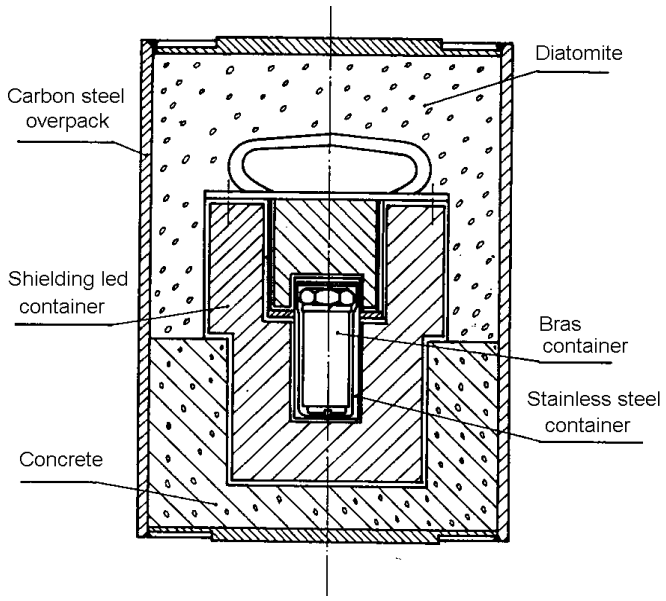


Fig. 3. Storage container for spent radium sources

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

The facility for purification and concentration of radioactive effluents has been commissioned. This 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.

Waste storage and disposal

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 low- and medium level waste containing short-lived beta and gamma isotopes, as well as a temporary storage for long-lived waste.

According to the waste acceptance criteria, the waste can be disposed in Różan repository only in solid or conditioned form.

In the first decade of NRWR operation, the concrete facilities No. 2, 3 and partially No. 1 (see Fig.3) were filled with the waste. This waste was not segregated, only partially conditioned and packed in different type of packages (metal drums, wood cases, glass), as well as no backfill material was used. Because of that some works must be done before the closure of Różan Repository:

- extract the waste from facilities No. 2, 3, partially No. 1 and segregate them,
- separate the long-lived waste placed in there,
- process them and enable their disposal in the future in new a deep geological repository,
- condition all radium- 226 waste and sources.

All of these activities arise from PHARE Project "The Preliminary Safety Analysis Report on Closure of the Repository" performed in the year 2004. More details about closure of Różan Repository are described in Annex 2.

Since 1968, short-lived low- and medium level waste has been disposed in a part of the dry moat in the Różan fort. The bottom and slopes of the moat have been covered with 20 cm thick concrete layer. The waste is arranged in the 'layer by layer' mode, and the free space between waste packages is filled with concrete. Long-lived waste is placed in facility no 1 with the intention of retrieval.

Further disposal of waste in the Różan moat with the presently used technology could not be continued because it would impede the access to the bricked-up door of fort facility No. 3 (see fig. 3), located in the corner of the south-western corner of the moat. The maintenance of this access zone is necessary though, as in the initial period of the NRWR operation, waste placed in the facility No. 3 was not segregated and partially not processed. Type of waste stored in that facility remains mainly radioactive sources and solid short-lived and long-lived waste.

In order to continue radioactive waste storage and disposal in Różan NRWR until 2025, its enlargement has been started by an adaptation of the southern part of the fort moat.

The adaptation shall consist of concrete walls and bottom preparation:

- of the retaining wall on the slope of the moat bank,
- the bottom of the moat,
- anti -corrosion hall,

all of which is meant to create a structure protecting deposited waste from the influence of external (mainly meteorological) conditions.

Processed and solidified waste, packed in 200 dm^3 drums, will be placed in the special containers. The containers shall be transported through internal premises of NRWR Różan and placed in a form of layers, with the fork truck use.

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-, medium- and high level radioactive waste. These categories are further sub-divided into sub-categories 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-, medium- and high-level, which are further subdivided according to the half-life of contained radionuclides into short-lived and long-lived sub-categories.

For low-level waste max. AC<10^4 x value from third column of the table in Annex 3 for particular isotopes.

For intermediate-level 10^4 x value <AC<10^7 x value.

For high-level – AC>10^7 x value.

The low, intermediate and high level waste is subsequently classified into sub-categories:

- Transitional waste which will decay within the period of three years below the value given in third column of Annex 3 ,

- Short-lived waste – waste containing radionuclides of half-life < 30 years with the restricted long-lived radionuclides concentration to 4000 kBq/kg in individual waste packages and to an overall average of 400 kBq/kg in the total waste volume,
- Long-lived waste: waste whose long lived radionuclides activity exceeds 400 kBq/kg.

The spent sealed sources are grouped into three subcategories:

- Low level - if the activity of the source exceed the value given in Annex 3 – second column, but is below 10^8 Bq,
- Intermediate level: if the activity is in the range 10^8<A<10^{12} Bq,
- High level: if the activity of the source A>10^{12} Bq.

Fig. 4. National Radioactive Waste Repository – 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 (water ponds);
- spent fuel storage facility no 19A (water ponds);
- technological pool of MARIA RR.

All the facilities listed above are located at Świerk Centre. Spent fuel storage facilities are operated by the Radioactive Waste Management Plant (RWMP). The technological pool of MARIA Research Reactor is also located at Świerk Centre and is operated by the National Centre for Nuclear Research (NCBJ).

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 storing 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.

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 spent fuel assemblies (SFAs) storage. The capacity of those facilities is sufficient for storage of all spent fuel rods and assemblies from the

MARIA RR. Currently this storage is used as a backup for the purpose of spent fuel storage from MARIA reactor in case of emergency. 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 in another place.

Spent fuel inventory

On 30th of May 2014, the total number of 93 SFAs including MR-6 and MC-5 fuel type are currently being wet stored in MARIA RR pool. Characteristics of the spent fuel currently stored in MARIA RR pool is given below.

Table 2. Spent fuel from Polish research reactor MARIA (30.05.2014)

Parameter	**MARIA Reactor**		
Fuel Type	**MR-6 (HEU)**	**MC-5 (LEU)**	**MR-6 (LEU)**
Fuel Operation	**2011-2014**	**2009-2014**	**2013-2014**
Number of fuel assemblies	**87**	**5**	**1**
Dimensions: Length, Diameter	**1380 mm** **70 mm**	**1315** **70 mm**	**1380** **70 mm**
Fuel composition	**UO_2 in Al**	**U_3Si_2 in Al**	**UO_2 in Al**
Cladding Material Thickness	**0.5-0.75 mm**	**0.4-0.6**	**0.4-0.6**
Initial % U-235	**up to 36%**	**19.75**	**19.70**
Average burn-up	**40% max.**	**60% max.**	**60% max.**
Cooling time (years)	**0-3**	**0-5**	**0-1**
Mass U-235 in single element (g)	**430**	**485**	**490.5**
Total mass of U-235 [g]	**22 796.32**		
Total mass of uranium [g]	**100 900.3**		
Total activity [Bq]	**2,78E+15**		

Table 3. Total activity of spent fuel [Bq]

Kr-85	**1,36E+14**
Sr-90	**1,01E+15**
Cs-134	**5,83E+14**
Cs-137	**1,03E+15**
Eu-154	**1,80E+13**
Pu-238	**3,31E+12**
Pu-239	**2,83E+11**
Pu-240	**3,44E+11**
Pu-241	**2,83E+13**
Am-241	**1,06E+11**
Total	**2,78E+15**

Table 4. Detailed information about the SNF shipments under GTRI – RRRFR Program:

Shipment No.	Date	Type of fuel	Cask type and casks number		Number of fuel elements	Mass before burn up [g]		Mass after burn up [g]			Nuclear material removed
						$U_{(total)}$	U-235	$U_{(total)}$	U-235	Pu	$U_{(total)+Pu}$
1	2009-09-12	WWR	VPVR/M	16	856	190 078.11	68 798.60	153 947.51	43 953.03	6 778.89	160 726.40
2	2010-02-27	WWR	VPVR/M	8	348	90 824.29	32 871.70	74 258.29	21 455.62	3 148.66	77 406.95
		MR	TUK-19	20	80	48 350.48	30 257.05	34 914.22	17 574.72	403.67	35 317.89
3	2010-05-08	MR	TUK-19	20	80	49 541.35	30 523.30	37 329.16	19 039.65	406.84	37 736.00
4	2010-07-24	MR	TUK-19	20	80	38 597.20	28 376.25	27 806.99	17 970.44	217.27	28 024.26
5	2010-09-25	MR	TUK-19	20	80	37 523.49	28 201.04	26 567.82	17 580.86	194.10	26 761.92
6	2012-09-09	MR	TUK-19	15	60	75 419.92	27 377.85	61 973.55	14 304.95	167.55	62 141.10
		EK10	VPVR/M	3	2595	211 233.00	21 123.30	201 372.00	17 386.50	4 904.55	206 276.55
Including:		**EK10**		3	2595	211 233.00	21 123.30	201 372.00	17 386.50	4 904.55	206 276.55
		WWR		24	1204	280 902.40	101 670.30	228 205.80	65 408.65	9 927.55	238 133.35
		MR		95	380	249 432.44	144 735.49	188 591.74	86 470.62	1 389.43	189 981.17
Total:				**122**	**4179**	**741 567.84**	**267 529.09**	**618 169.54**	**169 265.77**	**16 221.53**	**634 391.07**

Table 5. Other information about nuclear materials shipped

Shipment data on SNF from 2009 to May 2014	No. of shipment						Total
Total number of SNF shipments: 6	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	
Total mass of uranium [kg]	153,9	109,2	37,3	27,8	26,6	263,3	618,1
Uranium 235 mass [kg]	44	39	19	18	17,6	31,7	169,3
Plutonium mass [kg]	6,8	3,6	0,4	0,2	0,2	5,07	16,27
Total mass of uranium and plutonium [kg]	160,7	112,7	37,7	28	26,8	268,44	634,34
Total mass of fuel [kg]	1 555,20	1 245,4	506,3	506,3	506,4	863,9	5 183,5
Total weight of casks with SNF [t]	192,8	191,2	94,9	94,9	94,9	72,02	740,72
Weight of the containers with the casks [t]	227,6	239,8	125,7	125,7	125,9	132,48	977,18

Table 6. Information about 7th SNF shipment scheduled in August 2014

Date	Type of fuel	Casks	Number of casks	SNF Number	Mass before burn up [g]		Mass after burn up [g]				Total mass of assembly [g]
					U (tot)	U-235	U (tot)	U-235	Pu	U (tot)+Pu	
2014-08-20	MR	TUK-19	11	44	52 484	18 870.20	41 343.10	8 167.10	147.30	41 490.40	307 269

List of radioactive waste management facilities

- **Radioactive liquid waste storage farm capacities (Building No 35 A and B - Świerk site):**
  - 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 site)**
  - evaporator: 300 dm^3/h evaporated water, natural circulation, steam healing,
  - chemical treatment station: 1200 m^3/y,
  - reverse osmosis: 1 m^3/h,
  - bailing equipment (hydraulic press) – 12 T, volume reduction factor 3-5, 10 drums of 200 dm^3 each per shift,
  - cementation plant – 8 drums of 200 dm^3 per shift.

- **Temporary waste storage facility (Building No 93- Świerk site) 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

- **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 on the area of 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.

NRWR is considered as a storage facility for long lived waste and as a disposal site for low- and intermediate level, short-lived waste. Capacity of the Różan repository is sufficient for the waste arising in Poland up to 2025, along with the concept of enlargement its capacity. Detailed description of the facility has been given in Section B of the Report.

Radioactive waste inventory

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

Table 7. Activity of nuclear materials stored at the National Radioactive Waste Repository – Różan (1.01.1961 – 31.05.2014) (*)

Isotope	Initial activity (GBq)	Activity on 31.05.2014 (GBq)	Volume (m^3)
Pu-239	4 319,2	4 316,7	261,7
Th-230	13,6	13,6	44,6
Th-232	28,7	28,7	66,4
U-235	1,4	1,4	3,3
U-236	153,5	153,5	0,5
U238	1 262,2	1 262,2	171,7
Total	5 776,1	5 776,1	

Category of waste: long-live, low-level waste.

Type of waste:

- smoke detectors;
- spent sealed sources;
- solid waste;
- chemical compounds.

Table 8. Waste disposed or stored at the National Radioactive Waste Repository – Różan (1.01.1961 – 31.05.2014) (*)

Waste	Initial activity (GBq)	Activity on 31.05.2014 (GBq)	Volume (m^3)	Mass (t)
Waste disposed (short-lived)	363 134	32 066	3 986,4	3 210,0
Waste stored (Facility no 1, long-lived)	43 957	13 931	810,8	826,1
All facilities (total)	407 091	45 997	4 797,2	4 036,1

Waste category: low and intermediate level short- and long-lived waste.

For the activity of particular isotopes present in the waste stored/disposed at the National Radioactive Repository – Różan in the period of time 1.01.1961 – 31.05.2014 – see Annex 4.

(*) after correction data in waste inventory database

Table 9. Radioisotopes in waste stored in storage facility of Radioactive Waste Management Plant at Świerk

Isotope	**Activity on 31.05.2014 [MBq]**	**Initial activity [MBq]**
U-238	47 405	47 405
Co-60	5 911	6 951
Pu-238	5 540	5 603
Cs-137	4 297	4 392
C-14	3 704	3 705
Pu-239	3 527	3 528
H-3	3 027	3 130
Am-241	2 685	2 705
Zn-65	2 297	5 900
Ce-144	1 779	4 103
Sr-90	1 052	1 145
Te-123m	986	10 010
Ir-192	689	3 500
Tc-99	376	376
Kr-85	248	352
Co-57	239	1 188
Te-127m	236	3 003
Sb-124	210	9 600
Te-121m	165	1 001

Eu-154	93	107
I-125	44	19 918
Ge-68	23	111
I-131	11	21 759
Fe-59	10	155
Cr-51	8	126 321
P-32	8	85 142
Lu-177	8	18 234
S-35	3	1 109
Sr-89	2	890
Y-90	0	20 940
Tc-99m	0	8 678
Sm-153	0	3 720
Te-127	0	3 006
Mo-99	0	1 479
Re-188	0	1 021
Te-121	0	1 001
Ga-67	0	950
Re-186	0	685
Yb-169	0	270
Zr-95	0	105
Bi-213	0	100
other	211	683
Total:	**84 795**	**433 981**

Table 10. Types of waste stored in storage facility of Radioactive Waste Management Plant at Świerk

Waste	Volume [m^3]	Initial activity [GBq]	Activity on 31.05.2014 [GBq]
smoke detectors	35,7	12,1	11,6
transitional waste	24,5	254,2	0,5
other	33,8	167,7	72,6
Total:	**94,6**	**434,0**	**84,7**

Category of waste: low level, short, long-lived 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.

As the radioactive waste classification in Poland is based on earlier IAEA requirements in guides, the table and diagrams given below express its relation to the premises of Classification of Radioactive Waste No. GSG-1 document. Please note, that this is only due to comparative and illustrative purposes.

Table 11. Waste Classification by IAEA Safety Standads Series No. GSG-1: Classification of Radioactive Waste (2009) assumed for calculation

Class	Meaning	Functional allocation criteria applied
VLLV	Very Low Level Waste	specific activity of waste package ≤10^2 Bq/g (≤1Bq/g for alpha)
LLW	Low Level Waste	specific activity of waste package >10^2 Bq/g
		specific alpha activity of waste package <4 kBq/g
		specific activity long lived beta/gamma isotopes <10 kBq/g
		sources with half-life <15 years and activity <15 MBq
		sources with half-life <30 years and activity <1 MBq
ILW	Intermediate Level Waste	not classified as VLLW and LLW
HLW	High Level Waste	not occur in Poland

In Poland there are no VLLW class, boundary of 100 Bq/g was used as proposed in IEA Working Material on Guidance to NEWMDB (2010).

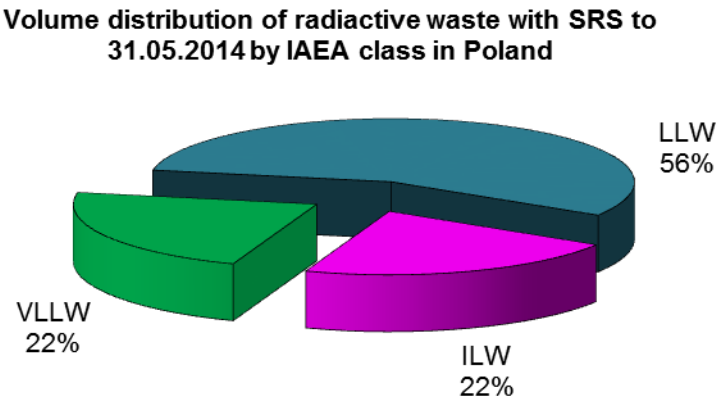
Allocation of spent sealed radioactive sources (SRS) was done according to: Annex 3: Table III-1 and Fig.III-1 of Classification of Radioactive Waste IAEA SS No. GSG-1.

For long lived beta and/or gamma emitting radionuclides such as ^{14}C, ^{36}Cl, ^{63}Ni, assumed boundary was 10 kBq/g.

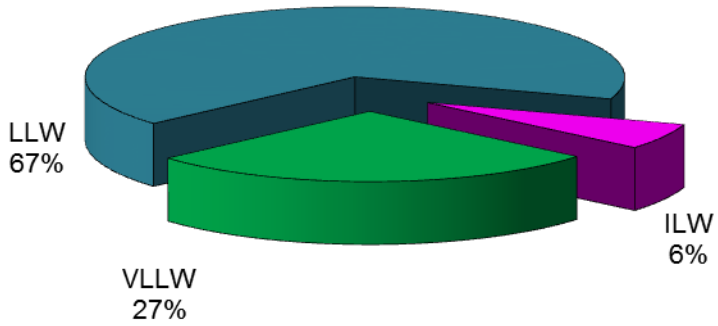
Class HLW not occur in Poland.

Table 12. Radioactive waste stored/disposed in NRWR in Różan to 31.05.2014 by IAEA No. GSG-1 classification

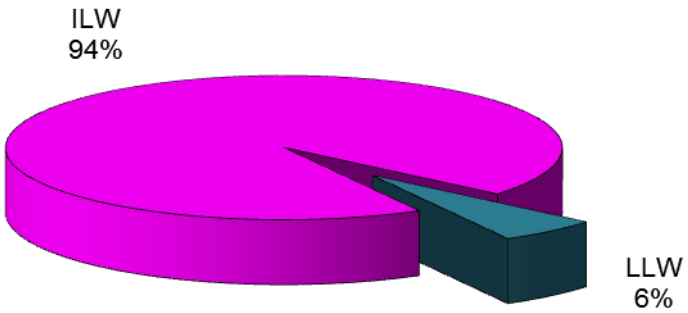
Type of waste		Volume [m^3]	Weight [t]	Activity [GBq]	Activity concentration [Bq/g]	Distribution [%]	
Waste	VLLW	851,4	885,2	16,4	18	27%	82%
	LLW	2 082,2	2 043,8	9 396,3	4 598	67%	
	ILW	187,3	175,7	5 132,8	29 213	6%	
	ALL	3 120,9	3 104,7	14 545,5	4 685	100%	
Source	LLW	39,5	40,4	1,3	33	6%	18%
	ILW	636,8	891,0	31 450,4	35 299	94%	
	ALL	676,3	931,4	31 421,7	33 768	100%	
All	VLLW	851,4	885,2	16,4	18	22%	100%
	LLW	2 121,7	2 084,2	9 397,6	4 509	56%	
	ILW	824,1	1 066,7	36 583,2	34 297	22%	
	ALL	3 797,2	4 036,1	45 997,2	11 397	100%	



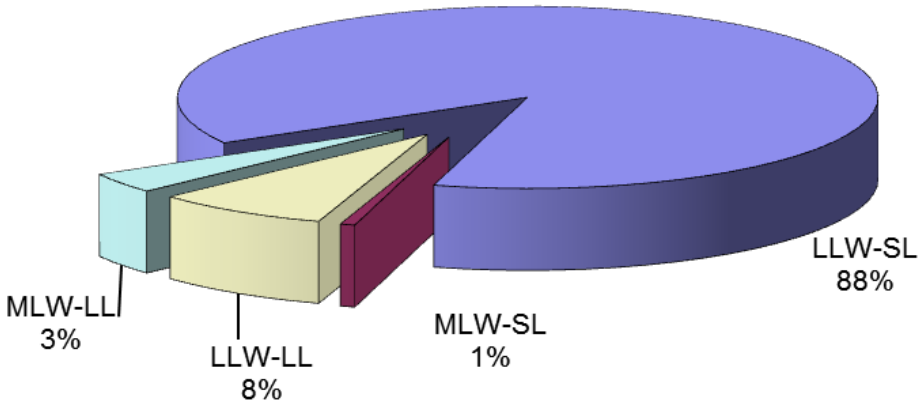
Volume distribution of radioactive waste (without SRS) to 31.05.2014 by IAEA class



Volume distribution of SRS to 31.05.2014 by IAEA class



Volume distribution of radiactive waste to 31.05.2014 by Polish waste category



Volume distribution of SRS to 31.05.2014 by Polish SRS category

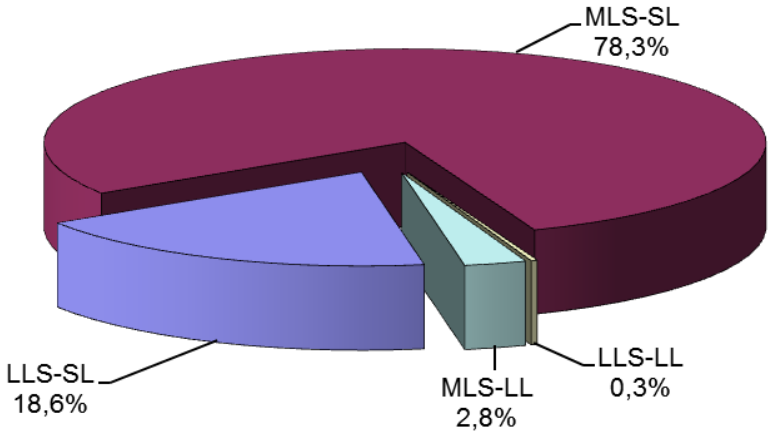


Table 13. Disused SRS stored in interim storage facility of Radioactive Waste Management Plant at Świerk

Source	Items	Activity on 31.05.2014 [GBq]	Initial activity [GBq]
Cs-137	1	252 833	312 790
Co-60	33	220 979	324 620
Co-60	1	143 830	170 600
Co-60	1	124 661	174 000
Co-60	1	113 332	164 400
Co-60	1	94 963	112 800
Co-60	1	93 333	135 000
Co-60	1	68 122	169 050
Co-60	1	62 607	170 000
Co-60	1	55 974	198 900
Co-60	1	55 522	101 306
Co-60	1	54 888	58 500
Co-60	1	51 601	124 550
Co-60	1	50 142	177 600
Co-60	1	49 708	152 500

Co-60	1	47 886	169 000
Co-60	1	46 748	93 400
Co-60	1	29 199	88 140
Co-60	1	20 458	92 500
Co-60	45	15 565	37 100
Co-60	1	14 917	42 600
Co-60	1	14 777	68 000
Co-60	1	13 822	35 520
Co-60	14	12 989	15 720
Co-60	14	5 511	6 670
Co-60	68	5 313	25 000
Co-60	27	2 194	7 440
Cs-137	1	1 309	1 534
Cs-137	1	1 309	1 534
Co-60	9	884	1 070
Co-60	1	374	1 360
Co-60	12	372	1 332
Co-60	1	309	1 170
Total:		**1 726 431**	**3 235 706**

Category of waste: high level, short-lived disused SRS

Table 14. Nuclear materials stored in interim storage facility of Radioactive Waste Management Plant at Świerk

Nuclear materials	Mass
Sources Pu-Be	398,4 g
Depleted U	3 749,0 kg
Th (chemical compounds)	5,3 kg
U nat (chemical compounds)	56,9 kg

Category of waste: long lived, low-level waste.

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 1996-1999.

Stage 1st and stage 2nd decommissioning of the EWA research reactor has been successfully completed. The spent fuel unloading, decontamination and the majority of dismantling works of EWA reactor were performed in the years 1996-1999.

Poland has adopted the 3 stages decommissioning procedures according to 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.

The works during the period of 1996-1999 indicate some differences between the plan adopted in 1996 and really executed tasks. This is partly a result of decision undertaken in 1997 concerning the reuse of reactor building and biological shields for the dry spent fuel storage and partly due to the experience collected during the decommissioning programme accomplishment.

During reported period of the decommissioning programme the requirements of nuclear safety and radiological protection as well as technological instructions and procedures have been strictly respected.

On the 27th February 2013 came into force Regulations on the requirements of nuclear safety and radiation protection for the stage of decommissioning of nuclear facilities and the content of a report on decommissioning of a nuclear facility. It gives detailed explanation on how to provide process of decommissioning on nuclear installations and the content of report from 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. Also 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 5).

The national legislative and statutory framework that regulates the safety of facilities and activities has been established in Poland; it is described under article 19. Also the National Atomic Energy Agency, maintained under the Ministry of Environment 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 (those bodies are at present maintained under the Ministry of Economy, see part B of the Report and Annex 2).

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 2012 Item 264 with further amendments), introduced a consolidated system ensuring nuclear safety and radiological protection in Poland. Summary of Atomic Law is presented in Annex 6.

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.

"Atomic Law" 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 & spent fuel management and radiation emergency preparedness. The Act in its current structure has been working for several years and is sufficient for current national needs, being namely: regulation of research reactor, radioactive waste and spent fuel storages as well as ionizing radiation applications in science, medicine and industry. Among the others, "Atomic Law" constitutes President of National Atomic Energy Agency (PAA) as central organ of governmental administration serving as nuclear regulatory authority in Poland. The President executes his tasks through the National Atomic Energy Agency. Organizational structure of PAA is shown on Fig. 9.

Last amendment of "Atomic Law" (in force since 24th May 2014, O.J, item 587) was prepared in order to implement into Polish legislation provisions of European waste directive (2011/70/Euratom) and to introduce safety requirements dedicated to radioactive waste and spent fuel management. The Directive imposes on the Member States the obligation to introduce national legislative, regulatory and organizational framework ensuring the high level of safety for the management of spent nuclear fuel and radioactive waste. The goal of amendment is to make complete the provisions and arrangements which are already in place in Poland. It also envisages the introduction of an obligation regarding the development of a national program for spent nuclear fuel and radioactive waste management in Poland.

"Atomic Law" is supported by set of detailed regulations issued by Council of Ministries listed in the Annex 7.

Fig. 5. Organizational structure of the PAA

System of licensing

Article 4 of Atomic law enumerates types of activities requiring licence issued by President of PAA. In field of RW&SF management licence is required for:

- storage, transport, processing or disposal of radioactive waste;
- storage, transport, reprocessing or trade of spent nuclear fuel;
- construction, operation and closure of radioactive waste repositories;
- construction, commissioning, operation and decommissioning of nuclear facilities which by definition include spent fuel reprocessing or storage facilities.

Licence 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 licence, have been established by the Council of Ministers Regulation on the documents required for licence application submitted for the practices that involve or could involve radiation exposure or for the notification of such practices, which replaced from the 1st January 2003 the former regulation issued in November 1995 and was further amended in years 2004, 2006 and 2009. Draft of next amendment is under consultation procedure. It will also refer to part dedicated to radioactive waste and spent nuclear fuel facilities.

Last two amendments of Atomic law introduced new types of documents required on different steps of licensing of nuclear facilities and radioactive waste disposal:

- for nuclear facilities: Siting Report, Preliminary Safety Analysis Report, Commissioning Program and Commissioning Report, Financial Report, SSC Safety Classification Documentation and Integrated Management System Documentation, Decommissioning Program;
- for radwaste repositories: Safety Analysis Report (containing evaluation of the location in terms of its suitability), Integrated Management System, Closure Program and Closure Report.

Draft licence before signing by President of PAA is reviewed by Council for Nuclear Safety and Radiation Protection (CNSRP) which is consulting and opinion-giving body of the PAA's 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 period of 4 years. The first council term began on 1st January 2012.

Prohibition of the operation without a licence

According to the art. 2 of the Atomic Law Act, activities involving real and potential exposures to ionising 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 ionising radiation requires licences, 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 licence is prohibited. The applicant/licencee must submit at each of the stages, together with his application for the licence 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 licence and for the specification of the relevant requirements and conditions in the text of licence document.

Also import into, export from and transit through the territory of Poland of radioactive waste and spent nuclear fuel shall require (art.62.1) the consent of the Agency's President.
The head of the organisational entity, who without the required licence, or in violation of the conditions attached to such a licence, 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 Agency`s President.

The Polish Criminal Code provides that whoever, without permission or contrary to stipulated conditions, possesses, uses, produces, reprocesses, collects or deals 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 the life or health of person or cause destruction to plant and animal life of considerable dimensions will be liable to imprisonment for a period of 3 months to 5 years. Whoever, in violation of the provisions of law, stores, disposes of, processes, renders harmless or carries waste or substances under such conditions or in such a manner that could endanger the life or health of human beings or cause the destruction to plant or animal life of considerable dimensions will be liable to imprisonment for a period of 3 months to 5 years. The same punishment will be imposed on anyone, who, in violation of the provisions of law, imports or exports wastes.

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:

- President of PAA 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 qualifying 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 President of PAA 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 and Euratom inspectors. Formally, inspections are divided into three types:

1. periodical inspections – as per inspection plan approved by the Agency's President;
2. ad-hoc 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 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 licence conditions are violated inspector can give recommendations to improve the nuclear safety and radiological protection. On the basis of inspection report 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 licence, violation of legal requirements or licence conditions, obstruction of inspection or loss of nuclear or radioactive materials monetary fines can be imposed.

President of PAA is also entitled to revoke the licence in the event when licencee 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 status, which does not comply with the conditions specified in the licence or with the legal provisions for activities covered by the licence.

Allocation of responsibilities

The responsibility for spent nuclear fuel management and radioactive waste management rests with the holder of the licence for activities leading to arising of either spent fuel or radioactive waste, until the handover of this spent fuel or this waste, with its documentation containing technical data and classification, to the Radioactive Waste Management Plant – the only legal entity in Poland, established under the Ministry of Economy and 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. Entity that conducts an activity involving exposure shall do it in a manner preventing radioactive waste generation. If it impossible entity shall generate waste on as low as reasonably achievable level – in respect of capacity, activity and radioactive concentration.

The responsibility for regulatory control of both – the particular users, and the RWMP - rests with the President of the National Atomic Energy Agency, the only legal authority in Poland to issue licences and binding opinions, and to perform inspections of activities leading to arising of spent nuclear fuel and radioactive waste.

Deciding whether to regulate radioactive materials as radioactive waste

The Atomic Law Act defines radioactive material 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 waste containing radioactive materials or contaminated by such materials, 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 spent sealed radioactive sources, 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 manager of the organizational unit 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 Agency's President but only in the cases of:

- discrepancies in waste classification performed by the manager of the organizational unit on which site the waste is arising and the classification performed by the manager of the organizational unit receiving the waste,
- ascertainment of irregularities in waste classification by the manager of the organizational unit on which site the waste is present,
- head of organizational entity won`t perform 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

The Atomic Law requires that activities involving real and potential ionizing radiation exposures from man-made radioactive sources, nuclear materials, equipment generating ionizing radiation, radioactive waste and spent nuclear fuel, are supervised and controlled by the State and can be permitted on the condition of employing regulatory means for the safety and health and life protection of humans, and also for the protection of property and environment (Art. 2). This includes the obligation of obtaining an appropriate licence, excluding the cases when such activities may be performed on the basis of notification or do not have to be licenced 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 licence from the competent nuclear safety and radiation protection authority is required to carry out activities related to the application of atomic energy[3] . Amongst the activities listed are:

1) manufacturing, processing, storage, transport or use of nuclear materials or radioactive sources as well as the trade in these materials,
2) storage, transport, processing or disposal of radioactive waste,

[3] Chapter 2, Article 4(1) of the Atomic Law Act.

3) storage, transport or reprocessing of spent nuclear fuel as well as the trade in this fuel,
4) isotopic enrichment,
5) construction, commissioning, operation and decommissioning of nuclear facilities,
6) construction, operation and closure of radioactive waste repositories,
7) production, installation, use and maintenance of the equipment containing radioactive sources and trade in such devices,
8) commissioning and use of the equipment generating ionizing radiation,
9) commissioning of laboratories and workrooms using ionizing radiation sources, including X-ray laboratories;
10) intentional addition of radioactive substances in the processes of manufacturing consumer products and medical devices, medical devices for in-vitro diagnostics, equipment for medical devices, equipment for medical devices for in-vitro diagnostics, active medical devices and trade in such products, and also the import into the Republic of Poland's territory, and export from this territory, of consumer and medical products to which radioactive substances have been added;
11) intentional administration of radioactive substances to humans and animals, for the purposes of medical or veterinary diagnostics, therapy or research.

Practices involving the addition of radioactive substances to foodstuff, toys, personal jewellery or cosmetic products, as well as the import of such products into, and export from the territory controlled by Polish customs, are prohibited[4]. Activity consisting in trading in radioactive waste is also prohibited. According to art. 5, art. 36-39 and art. 63 of the Atomic Law Act, legal authority to issue licences, binding opinions and to perform regulatory control of the activities involving radioactive waste and spent nuclear fuel in Poland is given to the President of the National Atomic Energy Agency (PAA).

The President of PAA issues the licences and accepts the notifications related also to other activities/practices that are listed above, with only the following exceptions: the licences for commissioning and use of X-ray equipment for medical purposes[5] and for commissioning of the laboratories using such equipment are issued by the State Regional Sanitary Inspector or – for organizational units subordinated or supervised by the National Defense Ministry – the commander of the military preventive medicine center, or – for organizational units subordinated or supervised by the minister for internal affairs – the State Sanitary Inspector in the Ministry of Internal Affairs and Administration.

As a consequence of the above exceptions also the supervision and control in the area of nuclear safety and radiological protection over the activities/practices resulting in factual or potential ionizing radiation exposures of people and environment, are executed by (Art. 63.2):

1) "regulatory bodies" (as defined below) – in the cases when the licence is issued or notification accepted by the President of PAA;

[4] Article 4(2) of the Atomic Law Act.
[5] In the following scope: medical diagnostics, invasive radiology, surface radiotherapy and radiotherapy for non-cancerous diseases.

2) regional sanitary inspector, commander of the military preventive medicine center or state sanitary inspector in the Ministry of Internal Affairs and Administration in the sphere of activities / practices licenced by these bodies.

According to definitions in the Art. 64.1 of the Act of Atomic Law, the "regulatory bodies" consist of:

1) the President of PAA, as the supreme nuclear regulatory body;
2) regulatory inspectors.

Atomic Law defines the task of the above regulatory bodies in its Chapter 9. They include in particular (Art. 64.4):

1) issuing licences and other decisions in 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 organizational units which possess nuclear materials, ionizing radiation sources, radioactive waste and spent nuclear fuel;
3) issuing on-the-spot orders if during the inspection it is found that nuclear safety and radiological protection are endangered.

The PAA President constitutes a central organ 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 this body are defined in the Chapter 13 of the Atomic Law Act.

Since the 1st January 2002, due to amendments made in the Act on Sectors of Governmental Administration (by the new Act passed by Parliament on 21 December 2001), the Agency's President is administratively supervised by the Minister of Environment. The Agency's President is nominated by the Prime Minister on request of Minister of Environment (Art.109.2). Prime Minister, in the form of regulation, may establish a detailed scope of activities for the Agency's President (art.111). This state has not changed after the last amendments in 2014.

The President of PAA executes his tasks through the National Atomic Energy Agency (PAA) (art.112 of the Atomic Energy Act). To perform regulatory tasks, the PAA President uses, as his executive body, the appropriate PAA departments (see Fig. 9), mostly the Department of Nuclear Safety (DNS) and the Department of Radiological Protection (DRP) in co-operation with Legal Department. They support the Agency's President in the discharge of his regulatory responsibilities and perform their duties related to particular regulatory tasks listed above as well as to the following ones:

(1) establishing regulations (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 and decommissioning of nuclear installation after appropriate review and assessment of all safety concerns (art. 5, art. 36-38),

(3) licensing activities related to the application of radiation sources (art. 5, art. 64.4 p.1),

(4) conducting review and assessment of the licencees' 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 licencees comply with the nuclear safety and radiation protection requirements as set forth in relevant regulations and terms of licences (66.1 p.3).

The terms of operating licences usually include a requirement to perform a systematic safety assessment of a facility and to maintain submitting by operator regularly (quarterly of half-yearly) the relevant reports for review by NRA.

President's Cabinet is in charge of communication with the public – through the website or periodic publications – to inform on regulatory requirements, decisions and opinions, and also – in cooperation with Radiation Emergency Centre CEZAR - to inform on radiation situation of the country and (also by press conference and interviews) - to react in a case of rumours or to advice in emergency situations.

Regulatory tasks involving facilities for the management of radioactive waste and spent nuclear fuel, including the nuclear material accountancy and safeguards as well as those involving other users of ionizing radiation sources are performed mainly by two Agency's departments: DNS and DRP. Liaison is maintained also with regulatory body authorities of other countries and with international organisations to promote cooperation and the exchange of regulatory information; it is organised by President's Cabinet with participation of representatives of departments performing regulatory tasks.

The licences and other decisions related to safety of 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 DNS, including its Division of Assessment of Nuclear Installations, Division of Radioactive Waste and Division of Control of Nuclear Installations. Inspectors from these Divisions 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.

Licences for activities/practices involving ionizing radiation sources are issued by the PAA President (or individuals authorized by him), basing on the draft documents prepared by the DRP. The inspectors from this Department perform all other relevant inspections.

Separation of regulatory and promotional function

Since the beginning of the year 2002 the Agency's President has no duties which could be in contradiction with its regulatory functions in nuclear safety matters. All the operators of nuclear facilities (research reactors, spent fuel and waste management, disposal and repository sites), as well as all organisational units performing activities licenced by or notified to the Agency's President are within the organisational structures other than PAA: the National Centre for Nuclear Research (operator of MARIA research reactor) and Radioactive Waste Management Plant (operator of the spent fuel facilities, the decommissioned EWA reactor and the radwaste management facilities in Świerk and disposal facilities in Różan) under the Ministry of Economy, while the PAA is in different sector of State administration - supervised by the Ministry of Environment. The clear separation of regulatory function from management and promotion functions has been then fully attained. Amendment of Atomic Law of 2011 introduced requirement that The President of PAA cannot promote the use of ionizing radiation, and in particular, of nuclear power sector.

Transparency in Regulatory activities and communication with the public

In order to underline changes taking place in PAA, a number of image changes were introduced and new communication channels with the general public and outside entities were opened. In 2013 the National Atomic Energy Agency refreshed its logo. A new logo has got a simplified font type and dynamic electron orbital rotating around the letters.

The change of logo was followed by the introduction of the Visual Identification System (VIS) defining colors, font types, letter formats and graphic signs which are used in PAA's letters and publications. Thanks to VIS all PAA publications, letters and promotional materials have consistent and modern dynamics which makes them easily recognizable.

In 2013, PAA also modernized its website. A new site is much easier to handle, has got extended substantive contents as well as richer and more attractive graphic design. The site contains regular news coverage regarding PAA activities and the most important information on nuclear safety and radiological protection.

In 2013 a new project was launched aimed at the introduction of a new Public Information Bulletin complying with the visual identification system.

One of the tasks of PAA President, specified in Article 110 Section 6 of the Atomic Law Act is to conduct of activities regarding public information, education and popularization and scientific, technical and legal information in terms of nuclear safety and radiological protection. This task entails in particular providing the general public with information about ionizing radiation and its impact on human health and also on the environment and about possible measures to be used in case of radiation events (accidents). This tasks is performed by staff members of the President's Office and Director's General Office. What is more to cover the issue regarding education and technical information, Bulletin on Nuclear Safety and Radiological Protection is quarterly published to addresses actual technical and legal issues in this area. It has been regularly published by PAA for more than 25 years.

In 2013, PAA modernized its communication channels with the general public and outside entities. Along with the introduction of a new website, the Newsletter mechanism was launched. It helps to send the most important news regarding PAA activities, international cooperation, important legislative and organizational changes to all the stakeholders.

President of National Atomic Energy Agency has also decided to make the report and all comments, questions and answers available to any interested party. Consequently, the report is available in English on PAA`s website: www.paa.gov.pl.

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 licence granted by 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 management of radioactive waste or spent nuclear fuel 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.

Therefore the legal provision exists that prime responsibility for the safety of spent fuel or radioactive waste management rests with the licence holder. To ensure that each such a licence 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 assessment (PSA) of nuclear facility which provide a detailed scope of PSA of nuclear facility and a scope of periodical assessment report. The Regulation on PSA of radioactive waste disposal is under preparation. The periodical safety assessment shall take place:

- at time intervals stated in the licence for the nuclear facility operation, but at least every 10 years,
- at time intervals stated in the licence for the radwaste repository, but at least every 15 years.

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;**

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.

State-owned public utility named Radioactive Waste Management Plant located in Otwock-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

There are 49 people working in the RWMP, 21 of them are university graduates. According to requirements of Atomic Law Act (art.11) all workers were trained on nuclear safety and radiological protection issues. Training programmes were developed by the director of RWMP on the basis of a licence conditions and approved by the licensing authority.

According to art.12 of Atomic Law Act and supporting Council of Ministries regulation (on positions important for nuclear safety and radiological protection and radiological protection inspectors, issued 10.08.2012 OJ item 1022), in the RWMP there are following positions, important for ensuring nuclear safety and radiological protection which may be occupied by the individuals possessing an appropriate authorizations issued by the President of PAA:

- specialist for accounting for nuclear materials
- radiation protection officers
- operator of spent nuclear fuel storage facility
- head of radioactive waste repository
- head of radioactive waste management plant.

Head of radioactive waste repository as well as head of radioactive waste management plant possess an appropriate authorization. This applies also to the specialist for accounting for nuclear materials and operators of spent nuclear fuel storage facility.

Financial resources

Financial resources available to support safety of the facilities for spent fuel and radioactive waste management are as follows:

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

Financial resources available are sufficient for routine activity of RWMP.

Draft of 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 derive 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 Minister of Economy. 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.

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 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 and radiological protection, depending on conducted activity, and in case of activities involving nuclear materials or nuclear facilities – also the requirements for physical protection". The programme should be submitted for review and assessment by the regulatory body. This 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. Review and assessment of relevant QA programmes is carried out by the regulatory body at all stages of the licensing process, i.e. prior to and during the construction, operation, closure and decommissioning of radioactive waste repositories and spent nuclear fuel repositories, and construction and operation of storage facilities for spent nuclear fuel. If necessary, suitable conditions and requirements will be included in the licence.

Regarding to art. 55f.1 operation and closure of nuclear waste repository shall ensure radiation protection of personnel and general public according to the licence issued by President of PAA and organizational entity`s integrated management system.

The regulatory body, through the requirements concerning the preparation and implementation of the QA programme, 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 QA programme, 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 QA programme by audits, document reviews and inspections of work. In practice the Quality Assurance programme were implemented for overall activity of the Radioactive Waste Management Plant, covering:

- Collection and transportation of radioactive waste from all the area of Poland.
- Treatment, conditioning and storage of radioactive waste in the technological facilities in the Świerk Center.
- Storage and Disposal of Radioactive Waste in the National Radioactive Waste Repository – Różan.
- Spent fuel storage in the facilities no 19 and 19A, encapsulation and shipment for reprocessing to the Russian Federation.

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.

2. 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.

In RWMP, there are 40 workers classified into category A and 9 classified into category B. 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 8.

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 years the average of individual dose equivalents registered were below detection value (0,4 mSv). Only in few cases this value was exceeded[6]. None of the workers receive an annual dose limit. The environmental monitoring within and outside the Świerk Centre and the National Radioactive Waste Repository – 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

[6] There have been seven employees only, who exceeded annual dose of 1,04 to 2,13 mSv

air, river and underground water, soil, precipitation, mud and vegetation. Since a few years the results of measurements show 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.

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.**

Regulation of the Council of Minister's of 18 January 2005 on the emergency plans for radiation emergency [issued on 18 January 2005, OJ (Dz.U.2005) no 20, item 169, last amendment in 2007, OJ (Dz. U. 2007) no 131 item 912], defines the responsibilities, scope, requirements and general rules of cooperation in a case of radiation emergency. According to this regulation, 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) and by the regulation of the Council of Minister's on the emergency plans for radiation emergency for facility and province levels.

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

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 manager. 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. This minister is obliged by Law (Art.96.2 of Atomic Law) to perform exercise to test the national level radiation emergency preparedness plan at least once every 3 years. According to present requirements (Art.96.1 of Atomic Law, regulation of the Council of Minister's on the emergency plans for radiation emergency) 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 facility manager respectively. Minimum testing frequency set by the regulation of the Council of Minister's on the emergency plans for radiation emergency is once every 3 years at regional (provincial) level and once every 2 years at facility level (once every 3 years for practices concerning X-ray devices).

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 Poland's borders. 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 President of the PAA. It is granted on the condition that applicant shall prove fulfillment 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 fulfill 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. 38 b pt. 2 states, that the decommissioning plan, which is obligatory to issue along with other documentations and assessments in the licensing procedure, shall be revised and updated not longer than every 5 years (according to art. 55j pt. 3 closure plan shall be revised and updated not longer than every 15 years regarding radioactive waste repository), and in case of the early closure of the facility (which is understood as equal to reduced exploitation period), the plan shall be revised and updated immediately and issued for an approval to the PAA`s President. It has to include the cost assessments of the decommissioning.

According to the Atomic Law amendments and Regulation by The Council of Ministers 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 licencee, financial responsibility for decommissioning as well as waste (any) and SNF management coming from the commercial facilities are to be held by the operator. According to the revision of the Atomic Law, the decommissioning/RW-SNF management fund(s) are to be set for any new nuclear facility. The rules and provisions for budgetary financed nuclear facilities remain the same and are guaranteed by the financing bodies. 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 a manager of organizational entity is obliged to submit to the President of PAA 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 18 months delay in continuing savings, the regulatory body may reserve (stop the operation of) the defaulting facility operation.

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, physical state of spent fuel elements, waste stored inventory etc.).

SECTION G. SAFETY OF SPENT FUEL MANAGEMENT

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

ARTICLE 4. GENERAL SAFETY REQUIREMENTS

Text of Article 4:

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

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

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

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

In particular the radiation protection standards and the spent fuel and radioactive waste safety requirements provided in the Chapters 3, 4 and 7 of the Atomic Law Act (see Annex 6) and also the requirements of the Council of Ministers regulation on radioactive waste and spent nuclear fuel, have to be fulfilled. These documents 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:
1) Maintaining appropriate distance between individual spent nuclear fuel elements,2) 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 are 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 2. Currently, the HEU used in Polish RRs are repatriated to the Russian Federation. The development of technologies and capacities for long term management of spent nuclear fuel is the responsibility of Polish Government (see Annex 2).

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 (ICRP 60/72 –BSS, relevant EU directives).

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 says 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.

At present spent nuclear fuel is stored only in MARIA reactor interim storage pool. In recent years, under the auspices of GTRI program, a conversion programme of MARIA RR to the fuel of LEU-type has been launched. Because of that it was necessary to increase the coolant flow rate through the reactor primary circuit in operation with LEU fuel. Therefore it was necessary to carry out the modernization of a cooling system of the reactor fuel channels, which has been completed in August 2013. After modernization, the LEU fuel was gradually introduced to the MARIA RR core, the conversion of core will be completed up to September 2014.

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 Ministries 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.
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 President of the National Atomic Energy Agency, is prerequisite to obtain the relevant licenses for this stages.

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;**

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 facilities 19, 19 A and MARIA reactor have appropriate valid licences for operation, issued by the President of the National Atomic Energy Agency 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. The licences 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 Department for Nuclear Safety. Engineering and technical support is provided if necessary. Operating experience is documented and reported to the PAA. Incidents are notified through established emergency channels.

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 is in interim storage phase only. 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 of Economy. 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 arised. 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 2.

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 Agency's 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 6) 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 (see also further comments made to Article 4).

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. This is because the fact that at the stage of initializing operation of the repository, no attention was paid to several other factors, from which the most important were:

- Providing appropriate bottom isolation;
- Providing good segregation and record on the waste disposed;
- Providing appropriate packing of waste.

These all factors led to occurrence of tritium releases. They have been observed since the very beginning from when the monitoring of groundwaters has been established within and around the repository (1989-1990). It is underlined though, that the releases appeared and appear within the borders of a repository – in its central part (see further explanation). Obviously at first it was impossible to identify from which particular part of the repository the releases are coming from. Nevertheless, in the course of PHARE projects, majority of inventory record was traced and recovered back and as a result, potential objects were identified, which may be the sources of release with the greatest probability. The methods used indicated that in the central object No.2 waste was not segregated nor conditioned in any appropriate way before it's input to this object, as well as, the construction of the object itself allows migration of the radionuclides to the groundwater system. Tracing back the inventory and matching it with the construction of the facility as well as measures from piesometers, it became clear that the releases originate from this object. The monitoring of groundwater is established both within the repository area and in wide range around. Analysis are being made on regular basis and the releases are not occurring outside of the repository area. Since the last JC review meeting, the tritium concentrations varied (depending on the seasonal and meteorological changes) from 25 000 to 45 000 Bq/dm3 in the piezometer located directly nearby the described object, whereas in the piezometer situated within the borders of the repository but close to fence and on the way of identified groundwater direction flow, the measurements observed are ranging up to 2000 Bq/dm3. No tritium has been observed in neighboring wells nor sources or piesometers located outside of the repository.

In the frame of the PHARE Project performed in the years 2003 and 2004, the safety reports related to respectively the operation, closure and post-closure phase of the Różan facility were also prepared. The operating phase report integrated all recent data concerning the safety of the site. The closure and post-closure reports have been prepared in line with international safety recommendations for radioactive waste management. In the near future,

Polish Geological Institute – National Research Institute will prepare the safety assessment for closure of Różan Repository, which start is planned ca. 2025.

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 Ministries 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 later 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;

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 President of the National Atomic Energy Agency, is prerequisite to obtain the relevant licenses for this stages.

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 licences, issued by the President of the National Atomic Energy Agency 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 Department for Nuclear Safety 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 licence 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 operate until 2025. On the basis of updated safety report for final closure of the repository which will be prepared by Polish Geological Institute, time scale for institutional control, as well as, post-closure activity has been 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;

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 Ministries 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 5, 6 and 7).

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 RWMP.

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 RWMP.

SECTION K. GENERAL EFFORTS TO IMPROVE SAFETY

Efforts connected with improvement of safety regarding radioactive waste and spent fuel management can be divided into following branches:

- continuation and intensification of works connected with siting and construction of new radioactive waste repository to take over the duties of Różan repository;
- preparation for safety closure of Różan repository;
- exportation of existing spent fuel from Polish research reactors to Russian Federation;
- preparation for nuclear power programme implementation in Poland - modification of the rules of conduct of the management of radioactive waste and spent nuclear fuel and decommissioning;
- strengthening capacities in staff and resources to provide effective and safe management of RW and SNF;
- selection the site for deep geological repository including SGP results and site selection for Polish Underground Research Laboratory;
- working for the implementation in Poland of an open fuel cycle while observing global trends and achievements of science in the reprocessing of spent fuel, and, if necessary, introducing appropriate changes in the proposed solutions;
- participation of Polish institutions and research centers in the ongoing research on issues relating to radioactive waste management;
- observation of trends for the use of MOX fuel;
- establishing a permanent international cooperation in the field of radioactive waste management;
- monitoring initiatives that may result in the construction of a common regional repository;
- developing research program on the management of radioactive waste and spent nuclear fuel.

All these areas have many interdependences and final decisions in each case will be influenced by outcomes of other projects. As it was mentioned in “Section A”, Minister of Economy was obliged by Atomic Law to prepare and send to EU Commission by the August 2015 national strategy regarding radioactive waste management and spent fuel management, which will take into account all relevant issues including embarking on nuclear power program. More detailed information upon works being held so far in the frames of the strategy preparation is given in the Annex 2.

On 15-25 April 2013 an international team of experts from Integrated Regulatory Review Service met with PAA’s representatives in order to conduct a peer review mission which had been requested by the Polish Government. The team conducted a review of national regulatory framework for nuclear and radiation safety and its effectiveness. The review mission consisted of 11 senior regulatory experts from the member states of the International Atomic Energy Agency (IAEA), four members of IAEA staff and one administrative staff member and one observer.

The review covered the way in which PAA exercises control over ionizing radiation users, radioactive waste management facilities and nuclear facilities, including research reactor. The IRRS mission experts also reviewed PAA preparations to perform the oversight of future nuclear power facilities. The experts praised PAA in its report for transparency, high qualifications of staff, active role on the international level and the compliance with safety standards. They also issued recommendations which should help PAA meet challenges brought by the development of the Agency over the next years. Some of these recommendations have already been implemented.

SECTION L. ANNEXES

Annex 1 - Nuclear sites in Poland

Annex 2 - 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, Ministry of Economy

Annex 3 - Activity and Activity's Concentration being base of radioactive waste classification

Annex 4 - Activity of Isotopes in the waste stored/disposed at the NRWR-Różan in the years 1961 – 31.05.2014

Annex 5 - International Conventions related to safe utilization of Atomic Energy and Safeguards of Nuclear Materials signed, ratified and implemented by Poland

Annex 6 - Summary of the new Act of Atomic Law, as amended on 24th of May 2014

Annex 7 - Executive Regulations to the Act of Atomic Law

Annex 8 - Radiation protection rules and dose limits in Poland

Annex I. Nuclear sites in Poland

A. Świerk Centre:

1. Research reactors

The only Polish operational reactor „MARIA" is a high flux channel-pool type one, of nominal thermal power 30 MW (first criticality date 1974/18/12), at present operating at about 20 MW thermal power, and used mostly to isotopes production and targets irradiation. It was operating at the time of entering into force of the Convention, after an extensive process of upgrading. In the years 1999-2002, a process of conversion (from 80% to 36% enriched fuel) of the MARIA reactor core was completed. The facility, operated by the National Centre for Nuclear Research (NCBJ), is subject to process of its constant upgrading and accommodation to actual tasks. In the years 2009-2011, two test of CERCA LEU fuel assemblies have been already successfully tested. Upon obtaining the consent of the PAA President, in September 2012 the conversion of reactor core into low enriched fuel started by loading into the core first fuel element MC. At present new components are being gradually loaded replacing the high enriched fuel used so far. In 2013, two test Russian 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 one is still in operation.

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. Its decommissioning process, authorized under general permission issued to its operator (NCBJ) - in 1997, has been decommissioned to the "brown field", which may be referred as to the 2nd stage according to IAEA definition, and is used for other purposes. The spent fuel unloading, decontamination and the majority of dismantling works were performed by NCBJ before the year 2002, when the facility was handed over together with spent fuel facilities to the newly created State owned public utility enterprise Radioactive Waste Management Plant (RWMP). Since the beginning of the 2002 RWMP has been continuing of EWA decommissioning works and operating 2 separate facilities containing all EWA reactor spent fuel (AFR, wet type of storage), under the new license issued by the PAA President.

Former critical assembly "ANNA" (first criticality date 1963/01/01), zero-power reactor "AGATA" (pool type, first criticality date 1973/05/05) and small power (100 kW_{th}) reactor "MARYLA" (pool type, first criticality date 1967/02/01) long ago had been permanently shut-down, unloaded of fuel and dismantled.

2. Spent fuel facilities

Spent fuel from MARIA reactor may be stored in the MARIA reactor technological pool operated by NCBJ or in the 2 separated interim spent nuclear fuel facilities at Świerk, operated by RWMP. More detailed information is given in Section D of the Report.

3. Radioactive waste facilities

RWMP operates the following installations and facilities at Świerk site (apart from interim spent nuclear fuel facilities mentioned above):

Treatment and storage of ILW and LLW liquid waste and LILW solid waste: evaporation facility and membrane separation facility, chemical treatment facilities (liquid waste), cementation unit, bituminisation unit, hydraulic press (12 tons), temporary storage facility.

B. NRWR Różan (the site was originally a military fort, converted to a repository in 1961)

The only repository in Poland, of near-surface type, partially serving for storage as well. It collects LILW Institutional waste, SSRS, interim storage in case of alpha waste. Low- and intermediate-level beta and gamma waste is being disposed of in a moat area (facility no. 8), and alpha-bearing waste is being placed in temporary storage in facility no.1.

C. Uranium mining

Uranium mining activities took place in the south-west of the country. Mining of ore has been finished in 1968, and processing was terminated in 1973. There are some 100 dumps, mostly abandoned, of waste rock and ore, reaching approximately 1.4 x 10^6 m^3 as well as one tailing pond, which is has been the object of a remediation project partly funded by the European Commission.

Annex II. 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 (prepared by Ministry of Economy)

Warsaw, June 2014

1. The Polish Nuclear Power Programme.

In January 28th 2014 The Polish Nuclear Power Programme was adopted by the Council of Ministers. According to the Programme in Poland will be built two nuclear power plants and the first unit of the first NPP should be operation in 2025.

Program schedule includes the following steps:

Stage I, 01.01.2014 - 31.12.2016:

- selection of the location and signature of a contract with Vendor of the technology chosen for the first NPP;

Stage II, 01.01.2017 - 31.12.2018:

- technical project and obtaining required by law decisions and opinions;

Stage III, 01.01.2019 - 31.12.2024:

- building permit and construction of the first unit of the first nuclear power plant, the start of construction consecutive units / nuclear power plants, commissioning of the first unit;

Stage IV, 01/01/2025 - 12/31/2030:

- continuation and start building the next unit / nuclear power plants. Completion of the first nuclear power plant (completion of construction of a second nuclear power plant is planned for 2035).

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 Management of Radioactive Waste and Spent Nuclear Fuel (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 RWMP,
- 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.

In May 2014 come into force amendment to the Atomic Law, which obligates Minister of Economy to prepare 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.

The Team prepared in May 2014 the draft of the Plan. For the draft of the Plan should be provided the Strategic Environmental Impact Assessment Procedure. The Plan should be also adopted by the Council of Ministers, what is expected to happen to the June of the year 2014 and then will send to EC.

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 (RWMP).

According to the estimates made by the Radioactive Waste Management Plant (RWMP), the NRWR-Różan will be completely filled as early as about 2025, 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 of Management of Radioactive Waste and Spent Nuclear Fuel. The draft Plan provides following stages for realisation of this task:

1. Finding potential sites Repository - 2013-2017.

2. The choice of location Repository - 2017-2018.
3. Repository design, obtaining all necessary decisions and permits - 2018-2019.
4. Construction - 2019-2023.
5. Obtaining necessary license - 2024.
6. Operation - 2025-2144.

The Ministry of Economy 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.

Ministry of Economy is now running activities associated with obtainingis public acceptance for detailed research.

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 low and intermediate (short lived) level waste. According to the estimates made by the Radioactive Waste Management Plant (RWMP), the NRWR-Różan will be completely filled as early as about 2025.

Consequently, it is necessary to the preparation of the closure, and then the final closing 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 - from 2015 to 2017.
2. Preparation of the concept of closure NRWR in Rozan - 2018-2020.
3. Preparations for the closing, preparation of the repository closure program and obtain a permit to close - 2020-23.
4. Discontinue of delivering of radioactive waste – 2024-2025.
5. Preparation of a report from the closure of the repository, to obtain a decision approving the report of the President of the PAA - 2024-2029.
6. Long-term monitoring - from 2030 to at least 2330.

The Ministry of Economy 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 final 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 on-site 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 of Economy 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 draft Plan provides following the nearest stages for realisation of this task:

- Analysis of conditions and the development of the project design – 2015
- Revision of locations based on legal criteria - 2017
- Match promising areas of research - 2019

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.

Poland decided also to participate 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.

To facilitate these activities, from 1st January 2012, the supervision of the Radioactive Waste Management Plant (RWMP) was transferred from Ministry Of State Treasure to Ministry of Economy. It is planned, that RWMP will be responsible for preparation of the repository project as well as all construction works.

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.

Basing 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.

Ministry of Economy 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 beyond 2020.

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

RWMP, 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 wind 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 draft 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 - 2015 -2019.
2. The necessary changes to the legal system - 2020-23.

Annex III. 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
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^{2}
Tc-97	10^{8}	10^{2}
Tc-97m	10^{7}	10^{2}
Tc-99	10^{7}	10^{3}
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^{3}
Rh-105	10^{7}	10^{4}
Pd-103	10^{8}	10^{2}
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^{3}
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^{4}	10^{4}
Sb-124	10^{6}	10
Sb-125	10^{6}	10^{3}
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

1	2	3
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^{3}
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^{4}
Nd-147	10^{6}	10^{3}
Nd-149	10^{6}	10^{3}
Pm-147	10^{7}	10^{4}
Pm-149	10^{6}	10^{3}
Sm-151	10^{6}	10^{4}
Sm-153	10^{6}	10^{3}
Eu-152	10^{6}	10
Eu-152m	10^{6}	10^{3}
Eu-154	10^{6}	10
Eu-155	10^{7}	10^{4}
Gd-153	10^{7}	10^{3}
Gd-159	10^{6}	10^{3}
Tb-160	10^{6}	10
Dy-165	10^{6}	10^{3}
Dy-166	10^{6}	10^{3}
Ho-166	10^{5}	10^{3}
Er-169	10^{7}	10^{4}
Er-171	10^{6}	10^{3}
Tm-170	10^{6}	10^{3}
Tm-171	10^{8}	10^{4}
Yb-175	10^{7}	10^{3}
Lu-177	10^{7}	10^{3}
Hf-181	10^{6}	10
Ta-182	10^{4}	10
W-181	10^{7}	10^{3}
W-185	10^{7}	10^{4}
W-187	10^{6}	10^{4}
Re-186	10^{6}	10^{3}
Re-188	10^{5}	10^{3}
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^{3}
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 IV. Activity of Isotopes in the waste stored/disposed at NRWR-Różan in years 1961-31.05.2014

Isotope	Activity on 31.05.2014 [GBq]	Initial activity [GBq]	Volume [m^3]	Mass [t]
Cs-137	21 085,90	34 387,40	1 821,90	1 997,30
Sr-90	5 122,40	6 235,20	162,5	126,7
Pu-239	4 316,70	4 319,20	261,7	373,9
Am-241	4 229,20	4 320,00	181,6	296,4
Co-60	3 900,10	60 124,00	2 117,00	2 528,10
H-3	2 090,40	6 378,70	495	393,3
U-238	1 262,20	1 262,20	171,7	168,7
Pu-238	876,1	978,3	59,1	50,8
Ra-226	724,7	732,1	440,6	471,2
Se-75	681,5	59 408,30	5,4	6,2
C-14	531,7	533,3	421,3	316,4
Ir-192	422,4	165 643,90	1 016,90	1 025,10
Kr-85	395,3	938,9	7,9	9,7
U-236	153,5	153,5	0,5	0,4
Ni-63	50,2	56,6	10,6	13,1
Eu-152	40,9	214,1	304	402,8
Th-232	28,7	28,7	66,4	114,7
Cm-244	16,1	22,1	0,3	0,4
Eu-154	15,4	207,3	17,1	16,8
Th-230	13,6	13,6	44,6	91,2
K-40	7,6	7,6	10,7	4,8
Cl-36	5,7	5,7	15,9	15,3
Cs-134	4	238,6	110,8	135,4
Pb-210	3,7	17,2	12,4	10,1
Tl-204	3,1	319,6	23,1	23,8
Sb-125	2,4	21,7	36,8	56,7
Pm-145	2,3	5	5	5,2
Pm-147	2,1	211,2	9,6	10,7
Zn-65	1,7	1 889,50	118,1	102,9
Ce-144	1,7	1 592,10	188,4	240,1
other	1,6	15,6		
U-235	1,4	1,4	3,3	4,1
Tc-99	1,2	1,2	193,2	131,8
Fe-55	0,5	23,4	6,8	5,7

Cf-252	0,4	4,6	0,8	0,8
Ru-106	0,3	153	115,7	177,8
Mn-54	0,1	62,2	13,1	10
I-125	0	27 008,20	1 314,60	1 276,10
S-35	0	15 063,60	119,5	91,5
Po-210	0	5 893,10	23,9	14,6
Yb-169	0	2 002,70	5,2	4,3
P-32	0	1 873,20	153,5	108,6
Cr-51	0	1 683,00	129,9	94,1
Nb-95	0	343,3	59,3	54,1
I-131	0	324,5	243,6	179,3
Ce-141	0	323,8	69,2	55,3
Na-24	0	275,1	5,6	5,6
Zn-69	0	262,9	3,6	4,9
Y-90	0	224,2	20,5	15,9
Tc-99m	0	207,9	193	131,7
Zr-95	0	184,5	94,5	84,6
Mo-99	0	152,3	37,7	26,9
Fe-59	0	139,8	27,9	24,3
Tm-170	0	129,2	2,7	0,7
Cm-242	0	111	0,4	0,5
Sb-124	0	58,2	57,4	44,5
Sr-89	0	48,6	44,1	27,2
Sn-113	0	48,1	15,9	12
Ca-45	0	30,8	60,6	46,7
Ru-103	0	24,7	44,2	38,9
Ag-110	0	20,3	9,7	3,9
Lu-172	0	18	4,6	3,2
Lu-177	0	14,2	20,6	11,1
Sc-46	0	13,8	3,4	1,3
I-123	0	11,2	2,3	1,6
Co-58	0	9,9	2,6	2,2
Co-57	0	8,4	47,7	58,3
Cu-64	0	5,8	1,7	0,9
Rb-86	0	5,6	1,4	1
Ir-190	0	5,6	0,1	0,1
Re-188	0	5,5	4,4	3,1
Cd-109	0	5,5	24,9	40,9
Hf-181	0	5	0,1	0,1
Sb-122	0	3,3	16,2	11,9
La-142	0	3,2	0,4	0,8

Na-22	0	2,3	58,9	60,6
Kr-88	0	1,9	0,6	0,6
Ba-140	0	1,9	25,8	16,7
Kr-90	0	1,9	0,3	0,1
Te-123m	0	1,8	11,6	28
La-140	0	1,6	7,6	7,7
Lu-166	0	1,5	0,4	0,3
Sr-85	0	1,2	5,7	4
Hg-203	0	1,1	2,4	1,9
Total:	**45 997,20**	**407 090,70**		

Annex V. 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 in 1965*;

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 27.04.2004, pursuant to art.42.2 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 March 1988*;

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 at present in stage of development.

(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 –the Chapter 12 of the Act of Atomic Law and Regulation of the Minister of Finance issued on 23.04.2004 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 5 May 2000*;

Compliance with this Convention reported under the 1st and the 2nd review process and the First and the Second 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 2010*

(9) Agreement between the President of the National Atomic Energy Agency of the Republic of Poland and the French Nuclear Safety Authority ASN of the French Republic for the exchange of technical information and cooperation in nuclear safety matters, *signed in 2012*

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

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 2001-2014. Last amendment was published in Official Journal on 9th May 2014 (item 587) and entered into force on 24st May 2014.

The Act is divided into 18 Chapters:

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

Chapter 2 entitled "Licenses addressing nuclear safety and radiological protection issues" lists the activities which require licenses or notifications from the point of view of nuclear or radiological safety, 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 manager of the organization 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 licence. New provisions referring to public access to information on nuclear safety of nuclear facilities and public involvement in licensing process were introduced. 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. Additional requirements that must be fulfilled by applicant were added. The licence 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).

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 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 managers of units 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;

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 radwaste 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 of Economy in preparing the National Plan of Management of Radioactive Waste and Spent Nuclear Fuel.

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 "Control 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, Environmental Protection Inspector, Chief Sanitary Inspector, State Fire Service, Building Control Office, Chief Labor

Inspector, 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;

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 of Economy 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 environmental 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 Minister for environmental matters. During amendment in 2011 President's consulting and opinion-giving body, "Council for Atomic Affairs", was replaced by "Council for Nuclear Safety and Radiological Protection. 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 President of PAA. The Council is elected for the period of 4 years. The first council term begun on 1 January 2012.

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 of Economy, who will provide the plant with a statute. This chapter specifies, inter alia, that the utility will receive 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 VII. Executive Regulations to the Act of Atomic Law

Regulations by the Prime Minister and the Council of Ministers

2002

- Council of Ministers regulation on exemption of certain practices from the obligation to apply for licensing, or from reporting obligations, 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 documents required for licence application submitted for practices that involve or could involve radiation exposure or for the notification of such practices issued on 03.12.2002, OJ (Dz. U. 2002), no 220, item 1851, in force since 01.01.2003 (amended 2004, 2006, 2009);
- Council of Ministers regulation on radioactive waste and spent nuclear fuel, issued on 03.12.2002, OJ (Dz. U. 2002), no 230, item 1925, in force since 01.01.2003;
- 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 amendments to regulation on documents required for licence application submitted for practices that involve or could involve radiation exposure or for the notification of such practices (Art.6.2), issued 27.04.2004 OJ (Dz. U. 2004) no. 98 item 981, in force since 01.05.2004 - amends existing regulation issued on 03.12.2002, OJ (Dz. U. 2002), no 220, item 1851;
- 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. 2004) no 20 item 168, in force since 01.02.2005;
- 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 01.02.2005 (amended 2007); replaced former regulation no. 239/2033 - 23.12.2002 and its amendment no.38/333-2003.

2006

- Council of Ministers regulation on amendments to regulation on documents required for licence application submitted for practices that involve or could involve radiation exposure or for the notification of such practices (Art.6.2), issued 11.07.2006 OJ (Dz. U. 2006) no.127 item 883, in force since 31.07.2006 - amends existing regulation issued on 03.12.2002 OJ (Dz. U. 2002) no. 220 item 1851 and its amendment no. 98 /981-2004;
- 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; replaced former regulation no. 239/2029 - 17.12.2002.

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; replaced former regulation no. 220/1850 - 03.12.2002;
- 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; replaced former regulation no.207/1753 – 01.01.2003;
- 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 4.10.2007, OJ (Dz. U. 2007), no. 185, item 1311 (amended 2010, 2012).

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.

2009

- Council of Ministers regulation amending the regulation on documents required for licence application submitted for practices that involve or could involve radiation exposure or for the notification of such practices, issued 21.04.2009, OJ (Dz. U. 2009) No. 71, item 610.

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;
- 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.

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.
- Council of Ministers regulation on positions important for nuclear safety and radiological protection and radiological protection inspectors, issued on 10.08.2012, OJ (Dz. U. 2012) item 1022, in force since 29.09.2012;
- 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;
- 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 1024, 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 licencee, issued on 10.10.2013, 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 16.03.2013;
- Council of Ministers regulation on requirements for the commissioning and operation of nuclear facilities, issued on 11.02.2013, OJ (Dz. U. 2013), item 270, in force 14.03.2013;
- 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.

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 1.01.2012.

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 Ministry of Finances

- Minister of Finances Regulation on guaranteed minimum amount of the compulsory civil liability insurance of the nuclear facility's operator, issued on 9.09.2011, OJ (Dz. U. 2011) no 206 item 1217,

Regulation of the Ministry 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.

Annex VIII. 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 60/72 – BSS, relevant EU directives).

Dose limits are established strictly according to the EU Directive 96/29 EURATOM in the governmental regulation on ionising radiation dose limits, issued 18.01.2005 (OJ no 20 item 168, in force since 01.02.2005). The effective dose limit for workers is 20 mSv per year (or equivalent dose for the lens of eye – 150 mSv per year, for the skin 500 mSv per year and for the hands, forearms, feet and ankles – 500 mSv per year respectively), it is allowed however to exceed it up to the 50 mSv in calendar year provided that in any 5 years period of his occupational exposure the worker shall not exceed effective dose of 100 mSv (average value of 20 mSv yearly). The same limits are for apprentices and students over 18 years old. For this category for age between 16 and 18 years old yearly limit is 6 mSv/y, for younger then 16 years – 1 mSv/y – the same as for general public. If the worker is pregnant woman, the limitation of her doses have to be such as her child to be born does not exceed the dose of 1 mSv. In special circumstances, strictly defined by law, the limits above may be exceeded with exclusion of apprentices, students and pregnant women. For population equivalent dose limits are 15mSv per year for the lens of eye and 50 mSv per year for skin; the limit of 1 mSv per year may be exceeded provided that in 5 years period the effective dose shall not exceed 5 mSv. Workers exposures are subject to optimization. For this purpose the radiation protection targets may be established by the management of facility. They are not subject to review or endorsement by the regulatory authority. On the contrary, the discharges of effluents to the environment are under control by the regulatory body and numerical values of relevant limits are usually included into the terms of licence. For the purpose of protection of population groups living in vicinity of nuclear facility the zone of limited use 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 manager of the organizational unit conducting activities / practices involving exposure (Art.7). This exposure must not exceed the dose limits described above, established in the regulation issued under the Art. 25.1 of the Atomic Law. 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 – the number of exposed workers and members of general public and their doses are as low as reasonably achievable. According to this principle, the manager of the organizational unit shall perform an assessment of the employees' exposure. If it seems necessary from the exposure optimization analysis – the director shall establish the authorized limits for the workers' exposure (dose constraints) to ensure that their ionizing radiation doses will be not greater than these limits, which in turn are lower than dose limits. If the authorized limits are established in the license, the licensing authority has to be notified of the possibility of their overrun by the organizational unit manager. The assessment of the employees' exposure is based on the spot-check of individual dose measurements or dosimetric measurements in the workplace. The workers whose exposure – according to the manager's assessment – can exceed 6 mSv in one year in the terms of effective dose or three tenths of dose limit values for skin, limbs and eye lens 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 licence 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 safety reports for 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 96/29/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.