NATIONAL ATOMIC ENERGY AGENCY

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

Polish 3rd national report as referred to in Article 32 of the Joint Convention

October 2008

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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 third one, following the 1st and 2nd national reports, issued in May 2003 and October 2005, and presented during the first and second Review Meetings of the Contracting Parties of the Joint Convention, held in Vienna in November 2003 and May 2006 respectively. The present report is 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 the legislative framework and regulatory control infrastructure that have taken place since the last review meeting. It includes in particular the matters that were suggested during the second review meeting to be addressed in the Polish 3rd national report.
The Report has been prepared for review, by the Contracting Parties, of the implementation by Poland its obligations under the Convention in connection to the Third Review Meeting to be held in Vienna in May 2009.

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 2000 institutions. The most important of them in terms of generation and management of radwaste 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 was founded (and initially supervised) by Ministry of Economy on 1st January 2002. From 1st January 2006 RWMP is acting under Ministry of the Treasury in Świerk site (30 km from Warsaw). Subsequently the waste is disposed of 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, may be completely filled by 2020. Currently also alpha radioactive waste and small amounts of nuclear materials (mainly depleted uranium) is temporarily stored in Różan.

Spent fuel from research reactors is stored either at reactor (in case of SF from MARIA RR) which is operated by the Institute of Atomic Energy (IEA) in Świerk site, or away from reactor, in 2 separate wet storage facilities (in the case of SF from EWA RR and part of encapsulated SF from MARIA RR). Decommissioning activities of EWA RR attained the end of their 2nd stage. Both of these 2 separate facilities, containing water ponds with spent fuel, as well as

[1] The project of the first NPP, planned at Zarnowiec (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 2020.

decommissioned EWA RR, 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 IEA or by the RWMP, and is under regulatory control of the President of National Atomic Energy Agency (NAEA), which is the national nuclear regulatory authority (NRA) 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. However, no formal arrangements for this return has been ever entered into, and as result, no spent fuel ever left the Świerk site.

By the decision of Prime Minister of 14th November 2007 "Governmental Team for Coordination of Actions Connected with Implementation by Republic of Poland an International Programme of Russian Research Reactor Fuel Return" was established. Team is chaired by professor Jerzy Niewodniczański – President of the National Atomic Energy Agency. Other members of team represent following ministries: Ministry of the State Treasury, Ministry of Foreign Affairs, Ministry of Finances, Ministry of Infrastructure and Ministry of Economy. By now there were three meetings held: on 10th December 2007 and 16th January & 20 March 2008. Beside permanent team members representatives of Radioactive Waste Management Plant and Institute of Atomic Energy were present during the meetings. Main outcomes of team's proceedings are as follows:

- Main objective is an implementation by Republic of Poland principles of Global Threat Reduction Initiative (GTRI), precisely the Russian Research Reactor Fuel Return (RRRFR) which is one of the three main components of GTRI.
- On 8th February 2008 there was a contract sign between Radioactive Waste Management Plant ("Polish implementation agent") and Battelle Energy Alliance ("U.S. implementation agent") regarding preparation of organizational and technical framework of spent fuel transportation from Poland to Russia.
- On 6th June 2008 there was a letter sent by professor Niewodniczański to Director General of State Atomic Energy Corporation "Rosatom" requesting estimation of costs of different elements (transportation, reprocessing, final disposal, etc.) of fuel return programme.

It is still to be decided if activities connected with spent fuel shipment to Russian Federation will cover EK-10 fuel (LEU)[2], and whether radioactive waste arisen as a result of spent fuel reprocessing shall be finally disposed of on a territory of Russian Federation. These two options are not financed by US-DOE under GTRI and appropriate funding shall be provided by Polish Government.

In April 2008 Council of Ministers obliged Minister of Economy (in cooperation with Minister of State Treasury – supervisory body of Radioactive Waste Management Plant) to prepare document describing new national strategy regarding radioactive waste management and spent fuel management. Document is expected to be published by the end of 1st quarter of 2009. 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);
- continuation of works connected with siting of a deep geological repository for high level and long lived wastes (possibility of final disposal of LEU spent fuel shall be also considered);
- continuation of works connected with closure of Różan repository (expected in year 2020);

[2] See Annex 3 for details on current EK-10 SF encapsulation programme

Taking into account that decision regarding embarking on nuclear power programme is still under discussion document shall consider two options: “nuclear” and “non-nuclear”. Parts of document related to nuclear safety and radiological protection must be approved by President of NAEA.

Contributors to the Poland’s National Report

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

- Radioactive Waste Management Plant
- Institute of Atomic Energy

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.***

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 have 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 handing over for reprocessing or for disposal as radioactive waste, is the responsibility of the Government, acting by means of dedicated governmental bodies. 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. Moreover, it is being considered as the preliminary condition for the possible future revival of the nuclear power industry in Poland. First step towards this goal was the launching of the Strategic Governmental Programme, performed in the years 1997-1999 (see **Annex 2**),. The results of the Programme, endorsed by the Government, led to the following conclusions and formulation of the policy goals:

- there are potential sites within the Polish territory for a future deep geological repository, which is prerequisite for final disposal of spent nuclear fuel as high level radioactive waste,
- the accumulated spent fuel from research reactors' operation , that have been kept originally in the wet-storage, have to be placed in the dry-storage, the first step of which, until the dry storage facility will be available, is encapsulation of fuel assemblies/rods into the leak-tight metal cans filled with inert gas,
- the design and engineering works should be continued with aim to accommodate former EWA reactor building structure for the purpose of dry-storage of spent fuel from research reactors,
- the research works on the deposit of homogenous clay rocks and 3 salt dams, which fulfil siting criteria for deep repository and were chosen for further examination, should be continued,
- developments in the potential regional disposal issue or in the return of spent RR fuel to the manufacturer should be monitored; however they cannot be considered as the real basis for a policy option until relevant formal international contracts are concluded.

To achieve the goals related to interim dry storage of accumulated spent fuel, 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. The project aims at assessing the possibility and implementing a new storage route for SNF. This route consists of placing each of SNF elements into dry conditions inside a capsule cartridge (so called encapsulation process), itself to be stored in dedicated container installed inside the shaft of decommissioned EWA reactor, which provides shielding. Main efforts focused on developing the dry store concept, encapsulation technology, procurement of relevant materials, equipment and instrumentation as well as testing of encapsulation technology.
The project is supported by investment (design and construction of the hot cell as well as adaptation of former EWA reactor building for SNF encapsulation and dry storage) financed from the state budget.
Currently part of the project 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. First batches containing elements with the longest wet storage presence has been successfully encapsulated. Nevertheless works connected with construction of dry storage facility were frozen, as its future development depends on final decisions regarding scope of RRRFR initiative and possible embarking on nuclear power programme.

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 operated for 37 years. The reactor was shut down in 1995 and decommissioned. Various types of fuel were used during operation of both RR:

- 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-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 now the only used. Currently programme of conversion of MARIA RR to LEU fuel has been launched. In near future testing of first LEU fuel elements should start. More than one option of fuel providers is considered.
SFA and rods are stored in two water ponds located in Świerk (facilities no 19 and 19A) and 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 Institute of Atomic Energy in Świerk. The encapsulated SNF (in amount of ca.160 SFA in the years 2003-2007) have been temporally placed back in the MARIA RR pool or transported to 19A RWMP wet storage facility (96 SFA). Further encapsulation of MARIA RR spent fuel was stopped due to evolution of RRRFR programme.
In the year 2008 process of EK-10 fuel encapsulation was launched. By the end of September 2008 896 EK-10 type spent fuel rods were encapsulated in to 32 capsules. Encapsulation of 924 rods of EK-10 type is planned up to the end of 2008. Total number of EK-10 rods to be encapsulated to the end of 2009 is 2595. See **Annex 3** for details on encapsulation facility.

Radioactive waste management policy

The management of radioactive waste, that means all practices involving processing, handling, storage and disposal of radioactive waste, 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. The collecting the radioactive waste after its handing-over by users, and 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 performed in the years 1997-1999, endorsed by the Government, 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 fulfilled,
- the conception for the closure of the current disposal facility in Różan has been prepared, however the decision to close the repository depends on technical possibilities of site operation and on the further acceptance by local community, as well as on the availability of another disposal site that could serve as the new national repository,
- the selection of the most promising regions was performed with a prospect of a new near surface repository siting. As a result of the analysis of these areas, 19 sites situated in 12 communes were chosen for geological research *in situ*. Efforts should be continued to obtain acceptance from the public and local authorities for the siting of the repository, that was not gained within the time frame of the Programme,
- constant effort should be maintained to upgrade waste management technologies which are presently in use; as regards 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.
General objective of the project was to increase the safety of the Różan repository and its further operation until 2020. Main efforts focused on the preparation an up-dated safety report for renewal of the licence for the operating phase and the safety report for closure and post-closure phase of the repository. All reports have addressed the issue of the contamination of the groundwater by tritium and maybe, in the longer term, by other radionuclides. Brief description of the results of the Project is given in **Annex 4.**

Radioactive waste management practices

The responsibility for all radioactive waste management is delegated to 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.

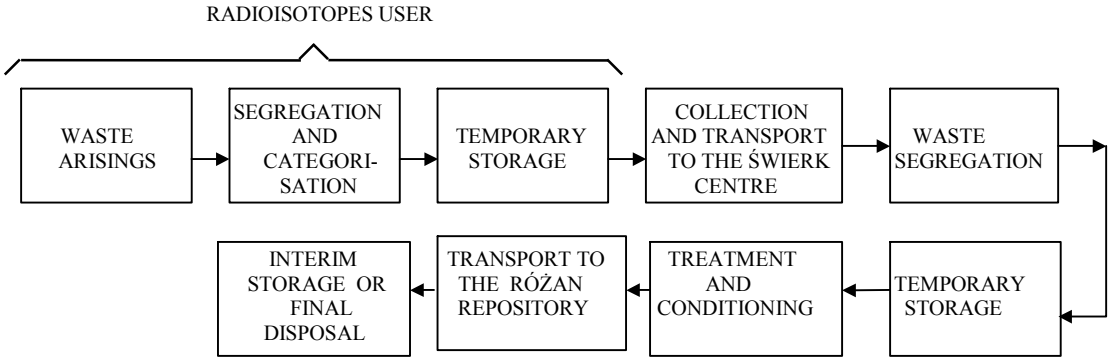

Fig. 1. The diagram of the radioactive waste management system in Poland

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 Institute of Atomic Energy (IEA) and from other scientific institutes.

Waste arisings

Radioactive waste comes from research reactors, scientific and educational institutions, industrial organizations and hospitals. At present, there is one 30 MW_t reactor working in the Świerk Centre - MARIA operated by the Institute of Atomic Energy. First Polish reactor – EWA was decommissioned to the 2-nd stage according to IAEA classification. More then two thousand 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.

Waste treatment and conditioning

The low-level liquid wastes were 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 is sorted. About 60% of total volume of the waste was subjected to the bailing technics with use of hydraulic press. Volume reduction factors obtained were ranging from 3 to 5 depending on the type of waste. Ion-exchange resins were conditioned by dewatering and mixing with polyester resin. The solid and conditioned wastes were 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**.

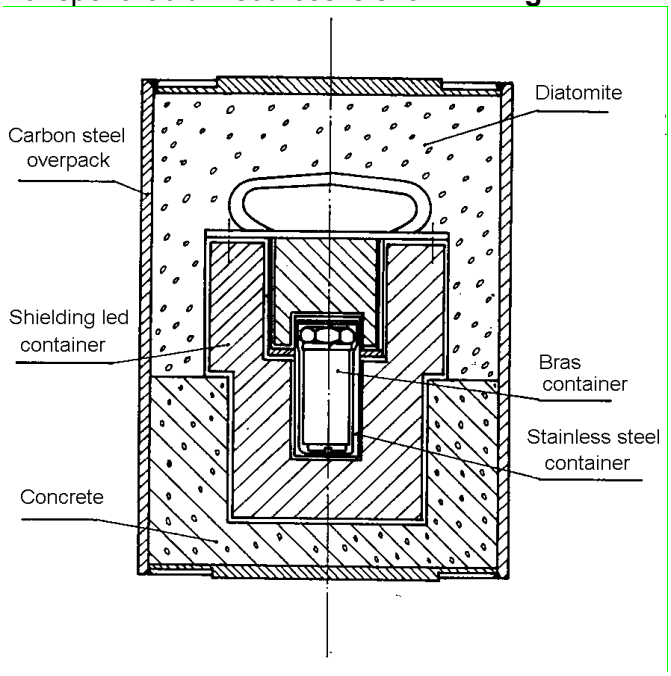

Fig. 2. Storage container for spent radium sources

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.
A new 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 superficial type repository operated since 1961. It is considered as a disposal site for low- and medium level waste containing short-lived beta and gamma isotopes and as a temporary storage for long-lived waste.
According to acceptance criteria only solid or conditioned waste can be disposed off at the Różan repository.
In the first decade of NRWP operation, the concrete facility 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 packages (metal drums, wood cases, glass). No backfill material was used.
Since 1968 short lived low- and medium level waste containing beta and gamma isotopes are disposed off in the part of moat adopted for that purpose (see **Fig. 4**). The floor and slopes of the moat were covered with 20 cm thick concrete layer. Waste is placed layer by layer and free space between packages are filled with concrete. Long-lived waste is placed in facility no 1 with the intention of retrieval.

Criteria used to define and categorize radioactive waste.

Radioactive waste is classified into **three categories** according to its activity level or surface dose rate: low-, medium- and high level radioactive waste. These categories are further sub-divided into **sub-categories** according to the half-live of radioactive isotopes contained in the waste, or according to its thermal power.
Disused (spent) sealed radioactive sources form an **additional category** of radioactive waste. Those sources are classified into the following sub-categories 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 in **Annex 5** 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:

- **Transition waste** which will decay within the period of three years below the value given in third column of **Annex 5** ,
- **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 5** – 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.

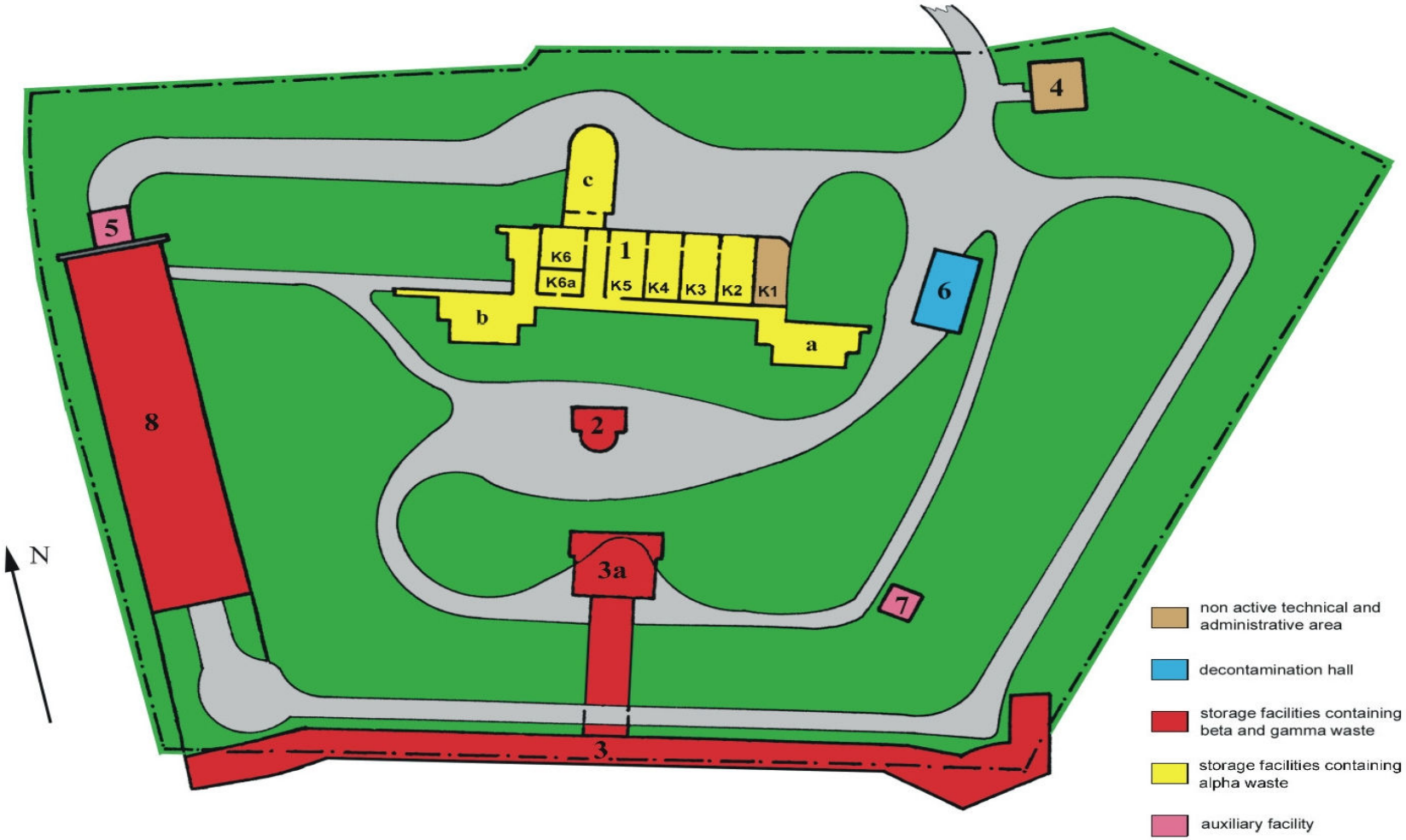

Fig.3. The Radioactive Waste Repository – Różan

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Fig.4. NRWR – Różan, Facility no 8 (moat)

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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

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:

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

b. has been disposed of; or

c. 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

Above listed facilities are located at Świerk Centre. Spent fuel storage facilities are operated by the Radioactive Waste Management Plant (RWMP). Nuclear research reactor MARIA is also located at Świerk Centre and is operated by the Institute of Atomic Energy (IEA).

The spent fuel storage facility No 19 consist of 4 cylindrical ponds placed in an underground concrete structure. Two of them are used for storing highly radioactive waste items and one is used for EK-10 spent fuel rods. The facility has been operated since 1958.

The spent fuel storage facility No 19A consist 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 are used for spent fuel assemblies (SFA) storage. The capacity of those facilities is sufficient for storage of all spent fuel rods and assemblies from the operation of two Polish research reactors MARIA (RR) and EWA (RR)

Spent fuel inventory

The spent nuclear fuel elements are currently being wet stored in pools as follows:

- EK-10 fuel type, 2595 rods in the storage facility no 19
- WWR-SM and WWR-M2 fuel type, 2095 SFA WWR-SM and 445 SFA WWR-M2 in the facility no 19A
- MR-6 and MR-5 fuel type 332 SFA in MARIA RR,
- MR-6 and MR-5 fuel type 96 SFA in the storage facility 19A

Characteristics of the spent fuel currently stored under in ponds at Świerk is given below.

Spent fuel from Polish research reactors

Parameter	EWA Reactor			MARIA Reactor	
Fuel Type	EK-10	WWR-SM	WWR-M2	MR-5,MR-6	MR-6
Fuel Operation	1958-67	1968-95	1988-95	1974-2002	2002-2005
Number of fuel assemblies	2595	2095	445	288	44
Dimensions Length, Diameter	595 mm 10 mm	865 mm 32 mm	865 mm 32 mm	1377 mm 70 mm	1377 mm 70 mm
Fuel composition	UO_2 in Mg	UAl_x in Al	UO_2 in Al	UAl_x in Al	UO_2 in Al
Cladding Material Thickness	Al 1.0 mm	Al 0.9 mm	Al 0.76 mm	 0.8 mm	 0.6-0.66 mm
Initial % U-235	10%	up to 36%	up to 36%	up to 80%	up to 36%
Average burn-up	15%	~45%	40%	35%	40% max.
Cooling time (years)	38-46	10-36	10-16	3-30	0-3
Mass in single SF element (g) U Mg Total mass of assembly	 80.2 13.0 171.0	 88.1 910	 108 910	 ~324 6500	 ~450/~350 7135
Total activity of spent fuel (TBq)	340	4700	1100	8070	

Total activity of spent fuel [Bq]

Kr-85	3,5E+12	1,5E+14	3,6E+13	3,7E+14
Sr-90	1,0E+14	2,1E+15	4,9E+14	3,5E+15
Cs-134		7,1E+12	1,7E+12	4,5E+14
Cs-137	1,3E+14	2,3E+15	5,3E+14	3,6E+15
Eu-154		4,6E+13	1,1E+13	
Pu-238	5,2E+9	3,1E+13	7,6E+12	
Pu-239	1,1E+9	1,8E+12	4,5E+11	
Pu-240	1,1E+14	1,5E+12	3,6E+11	
Pu-241	5,2E+11	9,0E+13	2,2E+13	1,5E+14
Am-241	9,1E+10	4,8E+12	1,2E+12	4,8E+11
Total	**344E+12**	**4732E+12**	**1100E+12**	**8070,5E+12**

List of radioactive waste management facilities

Radioactive liquid waste storage farm (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 defectors,
- 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) operated since 1961 and is the only repository in Poland. This repository is sited on the area of former military fort constructed in 1905-1908.The concrete structures as well as a 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 2015-2020.

Radioactive waste inventory

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

Activity of nuclear materials stored at the National Radioactive Waste Repository – Różan (1.01.1961 – 31.08.2008) (*)

Isotope	Initial activity (MBq)	Activity on 31.08.2008 (MBq)	Volume (m³)
Pu-238	977 362	915 966	58,91
Pu-239	4 174 336	4 172 638	260,92
Th-230	13 627	13 623	44,60
Th-232	28 671	28 671	66,02
U-235	1 423	1 423	3,29
U-236	153 480	153 480	0,48
U238	1 254 184	1 254 184	170,52
Total	6 603 083	6 539 985	604,74

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

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

Waste disposed or stored at the National Radioactive Waste Repository – Różan (1.01.1961 – 31.08.2008) (*)

Waste	Initial activity (GBq)	Activity on 31.08.2008 (GBq)	Volume (m³)	Mass (t)
Waste disposed (short-lived)	205 262,60	20 452,14	2 739,81	2 923,03
Waste stored (Facility no 1, long-lived)	43 002,41	13 935,96	800,35	815,34
All facilites total)	248 265,01	34 388,10	3 540,16	3 738,37

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 – 31.08.2008 – see **Annex 6**

(*) after correction data in waste inventory database

Waste stored in interim storage facility of Radioactive Waste Management Plant at Świerk

Isotope	Initial activity (MBq)	Activity on 31.08.2008 (MBq)
Cr-51	74 480	40 853
Cs-137	21 660	21 627
Zn-65	15 680	14 647
Ce-144	12 500	11 789
Co-60	7 694	7 628
Sb-124	7 200	5 461
Nb-95	2 796	1 741
Zr-65	2 532	1 952
Ce-141	1 742	1 044
Ru-106	1 690	1 615
Ru-103	1 659	1 087
La-140	1 588	0
Ba-140	1 500	404
Kr-88	1 380	0
Cs-134	1 267	1 239
Fe-59	120	83
I-131	79	10
Cs-138	17	0
Total	**155 584**	**111 180**

Category of waste: low- and intermediate level, short-lived waste.
Type of waste: spent ion-exchange resin
Mass: 600 kg

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

Source	Initial activity (GBq)	Activity on 31.08.2008 (GBq)
Cs-137	312 790	288 531
Co-60	198 900	119 192
Co-60	177 600	106 774
Co-60	170 000	133 317
Co-60	169 050	145 061
Co-60	169 000	101 970
Co-60	152 500	105 850
Co-60	124 550	109 880
Co-60	92 500	43 564
Co-60	88 140	62 177
Co-60	68 000	31 465
Co-60	42 600	31 765
Co-60	35 520	29 433
Cs-137	1 534	1 494
Cs-137	1 534	1 494
Co-60	1 360	796
Co-60	1 170	658
Total:	**1 806 748**	**1 313 421**

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

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

Nuclear materials	Mass
Sources Pu-Be	304,38 g
Depleted U	2 352,63 kg
Th (chemical compounds)	4,64 kg
U nat (chemical compounds)	5,10 kg

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

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 7**).

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, are 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 maintained under the Ministry of Economy and the Ministry of State Treasury)

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 <u>allocation of responsibilities</u> 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."

Basic law related to nuclear safety and radiation protection was established in 1986 as an Act of Parliament on peaceful use of atomic energy (Act of Atomic Law). On the basis of this Act, several governmental decrees and regulations have been issued by the Council of Ministers as well as by the President of the National Atomic Energy Agency (NAEA President, Agency's President). The Act and the regulations created an adequate legal framework at that time and provided for establishing a regulatory infrastructure, oriented to solve the nuclear and radiation safety problems, related in particular to safety of spent fuel and radioactive waste management. The legal framework, based on the 1986 Act, was generally consistent with international requirements, nevertheless there was increasing need for its revision to introduce some necessary amendments and supplements. In the late nineties a long term process was initiated by the NAEA President to revise Polish laws and regulations according to up-to-date, internationally accepted, basic nuclear and radiation safety requirements. Special attention was given to achieve compliance with the European Union directives and regulations in this area in the process of harmonization of laws and regulations with aquis communautaire, prerequisite to Poland's accession to European Union. It resulted in the replacement of the 1986 Act by the new one (Atomic Law), passed by Parliament on 29 November 2000.

The new *Atomic Law Act* of 29th November 2000, published in the Official Journal of Laws ("Dziennik Ustaw"), no.3, item 18, on 18 January 2001, and entered into force on 1st January 2002 . Pursuant to the new Act provisions several new regulations has been issued in the years 2001 and 2002 by the Council of Ministers or a Minister competent in particular issues. The Act and the secondary regulations govern in particular the safety of spent fuel and radioactive waste management. Up to the end of the year 2002 new 18 executive regulations to the *Act of Atomic Law* was prepared in NAEA and issued in the form of regulations of the Council of Ministers. Further 6 ones has been issued by the Prime Minister (2), Minister for Environment (2), Minister for Health (1), Minister for Internal Affairs and Administration (1).

To ensure full compatibility of the *Atomic Law* with the European Union laws, in 2003 the President of NAEA initiated the work aimed at amending this Act of Parliament and subsequently, where needed, the executive regulations. The purpose of these activities was, on one hand, to supplement or correct the existing regulations, and on the other – to eliminate the regulations transposing the EU provisions contained in EU regulations, in view of the fact that subsequent to the EU membership acquisition by Poland, the EU regulations will be binding directly within the domestic legal framework. The draft of the bill, prepared by NAEA staff (excluding the regulations involving medical exposure, developed by a special Ministry of Health team), after broad public and interdepartmental consultations, were approved in December 2003 by the Council of Ministers and in March 2004 passed by the Parliament[3] and entered into force on 1 May 2004. Further amendments proposals to the Act have been developed by NAEA in the year 2005, to assure proper implementation of the EU directive on high activity sealed sources (HASS), and new safeguards provisions stemming from trilateral agreement with IAEA and EURATOM.

Last amendment of Atomic Law from 11th of April 2008 (O.J. No. 93 Item 583) will enter into force on 25th December 2008. Most significant changes relevant to scope of Joint Convention are:

- Article 62. p.4.2 & p.4.3 and regulations issued on their basis **will be revoked**; that means 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.*

[3] Act of Parliament of 12 March 2004 on the amendment to the Acts of Atomic Law and Fiscal Duty Law (O.J.2004 no 70, item 632)

- In practice both regulations mentioned in previous bullet will be replaced by newly created “Chapter 8a” of Atomic law.
- Formally term “programme for nuclear and radiation safety” will be replaced by “quality assurance programme” defined as: *“system of actions, which ensures the fulfillment 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”* (Article 3. p.32).

The national safety requirements provided by the Act and secondary regulations related to safety of spent nuclear fuel and radioactive waste management are discussed below.

National safety requirements

Atomic Law Act of 29th November 2000 (as amended on 11th April 2008)

The Act defines **activities** related to peaceful use of atomic energy, involving real and potential exposures to ionizing radiation emitted by artificial **radioactive sources, nuclear materials, radiation generators, radioactive waste and spent nuclear fuel**. It defines also the **obligations of the managers** conducting these activities and **the authorities** competent in the area of nuclear safety and radiological protection. The Act requires that all these **activities and practices** shall be **permitted only if** the **adequate measures** defined in appropriate regulations **are undertaken to ensure safety** and protection of human life and health, as well as protection of the property and environment. The act incorporates also the principles of **liability for nuclear damages**, lays down **financial penalties for the violations** of nuclear safety and radiological protection regulations, and the **rules for imposing such penalties.**

The Act defines the term *nuclear safety* as the conditions achieved through overall organizational and technical measures undertaken to prevent occurrence of an uncontrolled, self-sustaining nuclear fission chain-reaction from **practices involving nuclear materials,** and to mitigate their consequences (Art.3 p.2); it defines also the term *radiological protection* – as the **prevention of human exposure and environmental contamination**, and if such prevention is not possible – **limitation of their consequences** to the as low as reasonably achievable level, taking into account economic, social and health factors;

The Act enumerates also the particular **activities that require a licence from** (or should be at least notified to) **the regulatory body**. Those activities include in particular the **manufacturing**, **conversion**, **storage**, **disposal**, **transport** or **use** of nuclear materials, radioactive sources, **radioactive waste and spent nuclear fuel.** They encompass also the **construction**, **operation**, **closure** and **decommissioning of disposal facilities** for **radioactive waste** and disposal facilities for **spent nuclear fuel** and **construction and operation of storage facilities for spent nuclear fuel**.

The **protection of health and training of workers**, employed in nuclear installations or **dealing with** the activities involving nuclear materials, **radioactive waste** and other sources of ionising radiation, **is** also **subject to regulatory control.**

The law requires that any activity involving exposure to ionising radiation shall be conducted by adequately trained and duly authorised personnel, and in such a way, that the number of persons exposed is as low as possible and that doses of radiation, received by such persons, are maintained at practically lowest level and do not exceed the dose limits.

The Act defines also the scope and responsibilities of the President of the National Atomic Energy Agency (NAEA) to whom is given authority of the regulatory body as defined in the art. 20 of the Convention .

Governmental regulations for nuclear and radiation safety

The general nuclear safety rules and requirements, defined in the *Act of Atomic Law* have been further developed into the more specific provisions and procedures in the form of executive regulations, established on the basis of specific delegations provided by the Act.
A brief summary of the Atomic Law Act and complete list of these regulations issued on its basis is presented in **Annex 8** and **Annex 9.**

System of licensing

The *Atomic Law Act* requires (art.4.1 p.3) a separate licence, issued by the President of NAEA, for construction, operation, closure and decommissioning of radioactive waste repositories and spent nuclear fuel repositories, and for construction and operation of storage facilities for spent nuclear fuel. 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 license 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 and 2006. The general procedure of licensing nuclear installation (including research reactors, radioactive waste and spent fuel management facilities), in the phases of construction, commissioning, operation, decommissioning or closure is illustrated on **Fig.5**.
Applications for a licence or for a official opinion related to an installation must be submitted to NAEA President. It applies also, with some modifications, to the stage of siting, which does not require NAEA President's licence, but only official opinion of this Body.

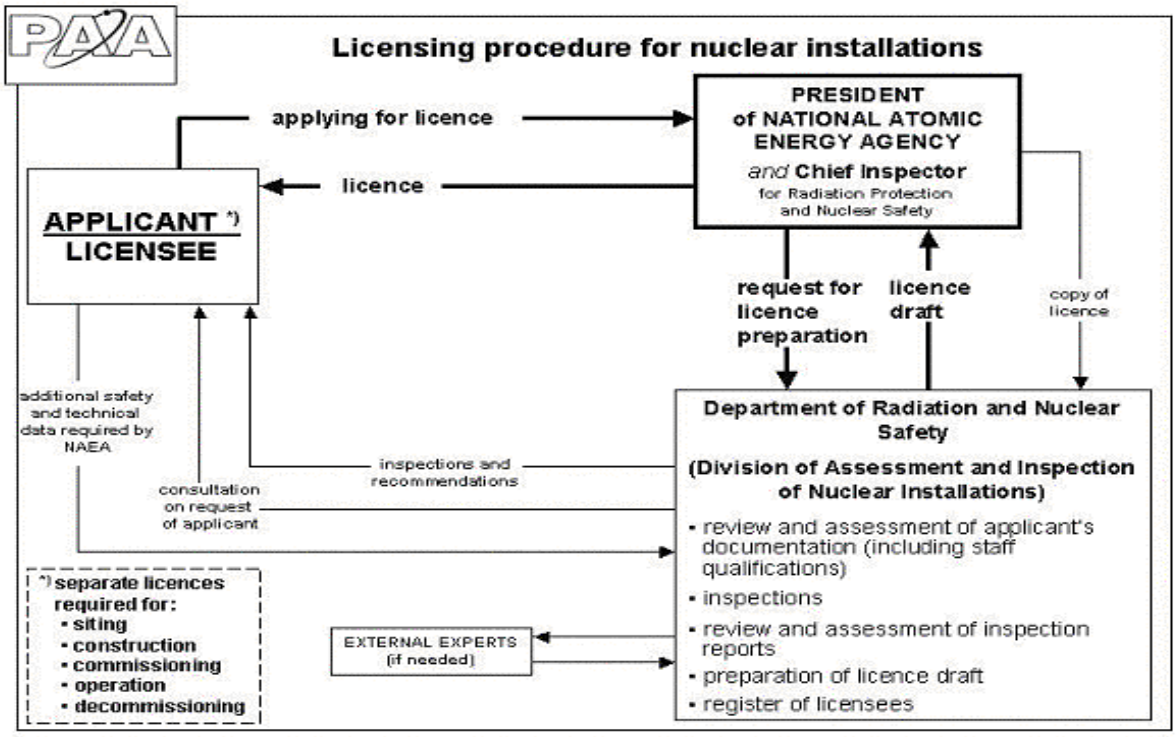

Fig. 5. Licensing procedure

Draft licences and opinions are prepared by the NAEA Department for Radiation and Nuclear Safety in its Division of Assessment and Inspection of Nuclear Installations, on the basis of review and assessment of safety documentation supplied by the applicant and also on the basis of inspections performed by NAEA regulatory inspectors in applicant's premises if

necessary. The reports from each of inspections, performed by NAEA inspectors in nuclear installations upon the Agency President's order, are submitted to the Chief Inspector and to the Agency's President.
While performing the review and assessment tasks, NAEA may use external consultant organizations and experts, but only on the condition that those organizations and experts are free from conflict of interest, i.e. they are not employed by or otherwise dependent on applicant/licensee. A draft license or opinion, if accepted by Chief Inspector, is submitted to the NAEA President for endorsement and the official granting to the applicant.
In the siting stage of radioactive waste and spent fuel repositories or spent fuel storage, the authority, competent to issue the decision on construction and development conditions on the site of a future nuclear facility, issues this decision after obtaining the Agency's President positive opinion on the matters concerning nuclear safety and radiological protection (art.36 or art.54 as appropriate)
The licensing process applies also to the staff of a facility. According to Art.12 of the *Atomic Law Act* in any facility performing activities involving radiation exposure, **the position important for ensuring nuclear safety and radiological protection have to be occupied exclusively by an individual possessing appropriate authorization issued by the Agency's President**. Licenses for such positions are granted on the basis of the qualification process, established by the Council Ministers' Regulation, issued pursuant to Art. 12.2 of the Act, and of the exams performed by the Commission for Qualification of Staff for the Posts Important for Nuclear and Radiation Safety, appointed by the NAEA President. Moreover, according to Art.11 of the Act, **any employee of a nuclear facility have to be duly trained, according to the program prepared by the facility manager and endorsed by the NAEA President**, to possess and maintain the knowledge of nuclear safety and radiological protection regulations appropriate for his position, as well as appropriate skills and qualifications.
Department for Radiation and Nuclear Safety, responsible for the assessment and inspection of the nuclear reactors as well as of the spent fuel and radioactive waste management facilities, operates also the Agency's President Central Register of Doses of all the occupationally exposed A - category workers in Poland.

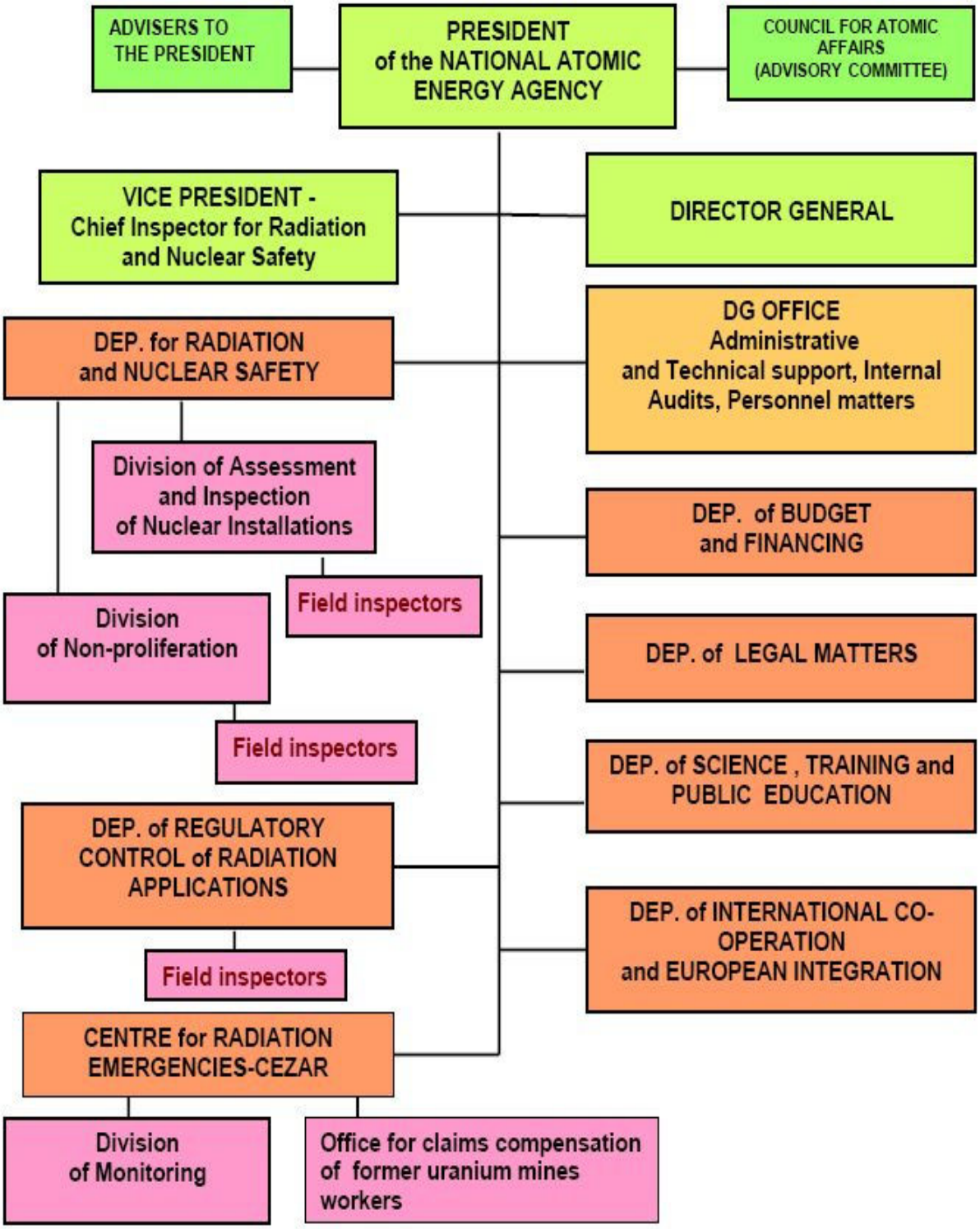

Fig.6. Structure of the National Atomic Energy Agency of Poland

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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.4.1.p.3) each subsequent stage, i.e. construction, operation, closure and decommissioning, requires separate licences, granted by the NAEA 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/licensee must submit at each of the stages, together with his application for the licence to the NAEA 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 license 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 Chief Nuclear Regulatory Inspector.

Institutional control, regulatory inspection, documentation and reporting

According to the *Act of Atomic Law*, Regulatory Body responsibilities include in particular conducting inspections in nuclear facilities and in other facilities possessing nuclear materials, ionizing radiation sources, radioactive waste and spent nuclear fuel (Art.64.4). To perform inspection tasks, the NAEA President uses, as his executive body, the appropriate NAEA departments. In particular:

- Department for Radiation and Nuclear Safety with its:
  - Division of Regulatory Assessment and Inspection of Nuclear Facilities,
  - Division of Non-proliferation and Safeguards
- Department of Regulatory Control of Radiation Applications

employ regulatory inspectors (see **Fig.6**), who are under direct control of Chief Inspector.

In the context of conducted inspection the regulatory Inspectors are entitled to (Art.66):

1) access at any time the means of transport and the sites of organizational units, where nuclear materials, ionizing radiation sources, radioactive waste or spent nuclear fuel are produced, used, stored, disposed or transported (in particular – nuclear installations),
2) access to the documents relevant for nuclear safety and radiological protection in inspected organizational unit,
3) conduct, if necessary, independent technical and dosimetric measurements,
4) request written or oral information, when it is necessary for clarifying a concern.

The manager of facility being inspected is obliged (Art. 67) to supply all necessary resources, to meet the conditions necessary for inspection, and make available all documents. The employees of the unit being inspected have to give the inspectors oral or written explanations on the questions related to the subject of inspection. Should an inspection reveal a direct threat to nuclear safety or radiation protection, the President of NAEA, the Chief Inspector or regulatory Inspectors are obliged by Art. 68 of the Act to give immediately applicable orders to impose emergency measures designed to eliminate the danger. The inspection procedure for both – the nuclear facilities and the radiation application activities – is presented on **Fig.7** .

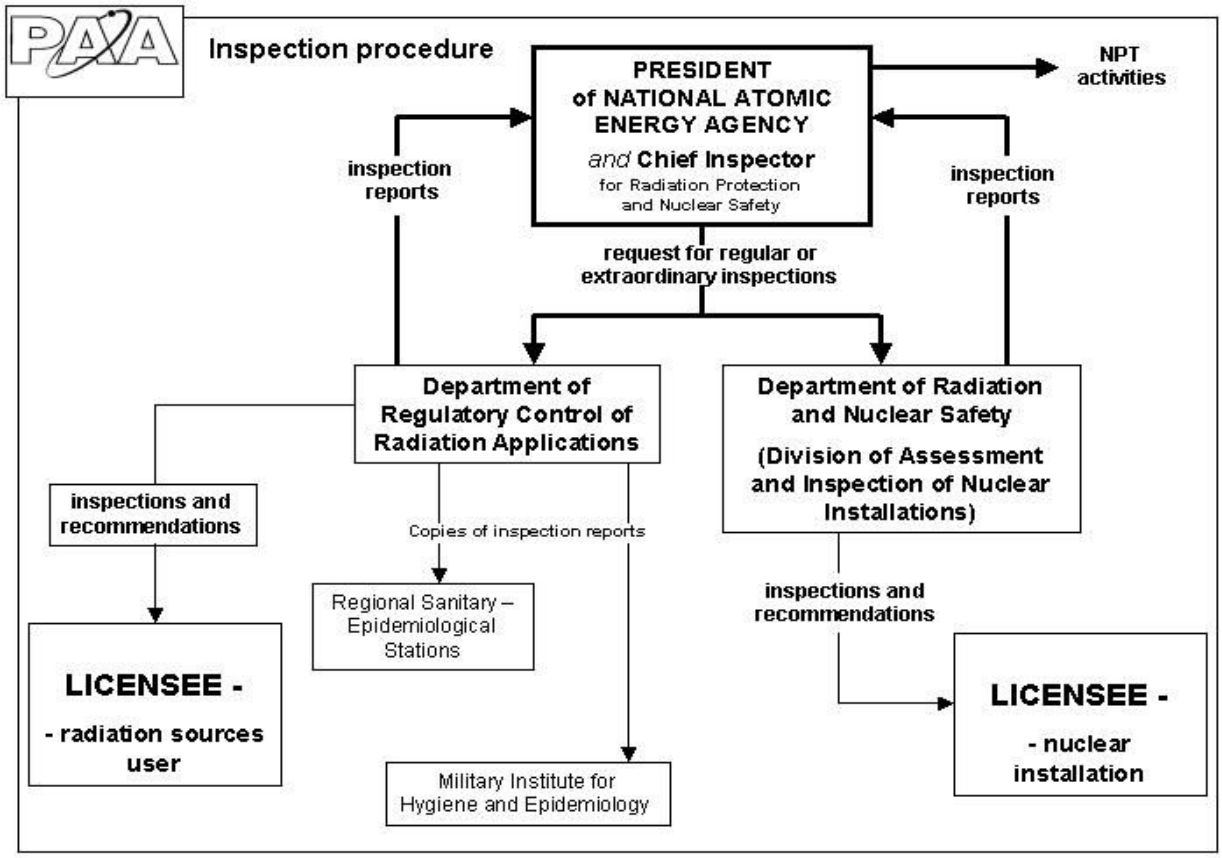

Fig.7. Inspection procedure

In the performing regulatory inspection the experience from former inspections of nuclear facilities and also international guidelines are taken into account. The primary purpose of regulatory inspection is the independent determination of how the licensee complies with the general nuclear safety and radiation protection requirements, with the licence conditions, additional regulatory requirements and good engineering practices; the inspection also is a check of the implementation of the QA programme.
To ensure the effectiveness of routine regulatory inspections, each of them is carefully prepared. The programme and scope of such inspections is formulated prior to visiting the site, relevant procedures are evoked or, if necessary, prepared by the inspectors. The personnel designed to carry out each inspection is selected and notified beforehand to provide adequate time to become acquainted with applicable instructions and appropriate background material. In some cases non-routine (special) inspections are performed.

Enforcement provisions

The *Act of Atomic Law* gives regulatory body adequate powers to enforce compliance with safety requirements imposed by laws, regulations and licence conditions. According to its Art. 5.5 and Art 5.6 the NAEA President may **revoke a licence or modify it** as needed. In particular (Art.5.11) Agency's President shall **revoke a license if** nuclear safety and radiation protection **requirements imposed by applicable regulations and of the terms of licence have not been fulfilled**. Depending of regulatory assessment of situation the following enforcement actions can be undertaken:
(1) oral or written immediately applicable order (Art.68)
(2) issuance of a written warning or directive to the licensee (Art.67.4, Art. 69),
(3) ordering the licensee to curtail activities (Art.39),
(4) suspension or revoking the licence (Art.5.11),
(5) financial penalty collected by mean of administrative execution proceedings (Art.123)..,

(6)punishment by fine or detention (Art. 127).
(7) recommendation of prosecution through the courts of law.
The regulatory inspectors have been equipped by Art.68 of the Act of Atomic Law with the authority to take on-the-spot decisions.

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 currently **acting under Ministry of the State Treasury** to perform the collection, treatment, conditioning, interim storage and - above all – the activities **ensuring permanent feasibility of radioactive waste and spent nuclear fuel disposal.**
The responsibility for **regulatory control** of both – the particular users, and the 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 (see also the text below, under Article 20)

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 licensed or notified according to the criteria established in the regulation of the Council of Ministers of 6 August 2002 (amended in 2004), based on the Article 6.1 of the Atomic Law.*
Under the Atomic Law, the following activities / practices involving exposures require a licence or notification (with reservation as above):

1) *manufacturing**, conversion, reprocessing, storage, disposal, transport** or use of, and trade in, nuclear materials, radioactive sources, **radioactive waste and spent nuclear fuel**;*
2) *construction, commissioning, test and permanent operation and decommissioning of nuclear facilities;*
3) ***construction, operation, closure and decommissioning of disposal facilities for radioactive waste and disposal facilities for spent nuclear fuel, and construction and operation of storage facilities for spent nuclear fuel**;*
4) *manufacture, installation, use and maintenance of equipment containing radioactive sources and trade in such equipment;*
5) *manufacture, purchase, commissioning and use of the ionizing radiation generating devices;*
6) *commissioning of laboratories and workrooms using ionizing radiation sources, including X-ray rooms;*

7) *intended addition of radioactive materials in the processes of manufacturing consumer and medical products, and trade in such products;*
8) *intended administration of radioactive materials to humans and animals, for medical or veterinary diagnostics, therapy or research purposes.*

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**.

The President of the National Atomic Energy Agency **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[4] 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. 6.2):

1) "regulatory bodies" (as defined below) – in the cases **when the license is issued or notification accepted by the President of the Agency**;
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 licensed 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 NAEA, as the supreme nuclear regulatory body,
2) Chief Nuclear Regulatory Inspector, as the higher-level body in relation to the nuclear regulatory inspectors,
3) 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,
4) **approving training programs** developed by the managers of organizational units operated on the basis of a licence (except the training programs developed by the managers of organizational units using X-ray equipment for medical purposes).

The President of NAEA 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

[4] In the following scope: medical diagnostics, invasive radiology, surface radiotherapy and radiotherapy for non-cancerous diseases.

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).

The President of NAEA executes his tasks through the National Atomic Energy Agency (art.112 of the Atomic Energy Act). To perform **regulatory** tasks, the NAEA President uses, as his executive body, the appropriate NAEA departments (see **Fig.6**), mostly the Department for Radiation and Nuclear Safety (DRNS) and the Department of Regulatory Control of Radiation Sources (DRCRS) 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 licensees' documentation, demonstrating the safety of nuclear installations or other radiation sources application (art.66.1 p.2),

(5) verifying whether the activities/practices performed by licensees comply with the nuclear safety and radiation protection requirements as set forth in relevant regulations and terms of 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.

The issues involving the training program acceptance are covered by Department of Science, Training and Public Information (DSTPI), which is also in charge of communication with the public – by web page or periodic publications – to inform on regulatory requirements, decisions and opinions, but also – by communications of the Agency's President - 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: DRNS and DRCRS. 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 Department of International Co-operation and European Integration 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 NAEA President, on the basis of documents prepared by a facility operator and opinion on these documents by the DRNS, including its Division of Assessment and Inspection of Nuclear Installations. Inspectors from this Division 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 NAEA President (or individuals by him authorized), basing on the draft documents prepared by the DRCRS. The inspectors from this Department perform all other relevant inspections.

Separation of regulatory and promotional function

Neither National Atomic Energy Agency nor its President, being the NRA in Poland, is responsible for promoting of any activities being under their regulatory control. With respect to research reactors or spent fuel and radwaste facilities, the clear separation between regulatory and managerial responsibility of the NAEA President was achieved according to provisions of the *Atomic Law Act* of 29 November 2000 by appropriate organizational changes successfully performed before the new Atomic Law entered in force. 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 licensed by or notified to the Agency's President are within the organisational structures other then NAEA: the Institute of Atomic Energy (operator of MARIA research reactor) under the **Ministry of Economy** and Radioactive Waste Management Plant (operator of the spent fuel facilities, the decommissioned EWA reactor and the radwaste management and disposal facilities in Świerk and Różan) under the **Ministry of the State Treasury** while the NAEA 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.

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 can not be disregarded from radiological protection viewpoint. Radioactive waste means solid, liquid or gaseous waste containing radioactive materials or contaminated by such materials, **assigned to waste category**, according to its activity level or surface dose rate, and, if appropriate, **to waste subcategory** - according to the half-live of radioactive isotopes contained in the waste, or - according to emitted heat power (art.47.1). 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, or
- ascertainment of irregularities in waste classification by the manager of the organizational unit on which site the waste is present.

Also spent nuclear fuel is treated as radioactive waste of high-level category - if intended for disposal (art.52.3).

SECTION F. OTHER GENERAL SAFETY PROVISIONS

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.***

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 and operation** of **storage facilities** for spent nuclear fuel as well as the **construction, operation, closure and decommissioning** of radioactive waste and spent nuclear fuel **repositories**, and require licence granted by NAEA President. Also the **import, export or transit** of radioactive waste and spent nuclear fuel requires consent from this Body.

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.

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, 20 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 the posts being of primary importance for the nuclear safety and radiation protection, and on the regime and procedures to be followed in the granting of authorization indispensable for holding such post*, issued 18.01.2005 OJ No 21 item 173) , 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 National Atomic Agency's President:

- specialist for accounting for nuclear materials
- 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 State Treasury
- state budget through the budget of National Atomic Energy Agency
- service activity of RWMP.

Financial resources available are sufficient for routine activity of RWMP. However, no financial provision is made currently which will enable to support safety for decommissioning, closure of the repository, and the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of the disposal facility.

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 NRA pays special attention to the fulfilment of the QA-related requirements. According to art. 7.2 of the *Atomic Law Act*, the applicant/licensee is required to establish and effectively implement of the QA programme. In previous versions of Atomic law term "a programme for nuclear and radiation safety" was used but since last 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.

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 programmes were implemented for:

- operation of the National Radioactive Waste Repository – Różan
- operation of spent nuclear fuel storage facilities no 19 and 19A
- overall activity of the Radioactive Waste Management Plant.

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 10 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 10**.

Exposure assessment for category A workers is based on systematic individual dose measurements and, if such workers my 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 of film and TLD dose meters. In the last 3 years the most of individual dose equivalents registered were below detection value (0,1 mSv). Only in few cases this value was exceeded[5]. The environmental monitoring within

[5] There was one case of annual dose of 6,25 mSv

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 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 20 February 2007 on the emergency plans for radiation emergency (issued on 23 December 2002, OJ (Dz.U.2002) no 239, item 2033, 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 National Atomic Energy Agency, 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 (Voivoda) in co-operation with the proper State Regional Sanitary Inspector. On national level this is responsibility of the minister of internal affairs matters, with the NAEA President 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 in 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. In practice such exercises are performed every one-two years for the facility and every one-three years for the province.

As there is no NPPs in Poland and existing other nuclear facilities are sited far from the national borders, it is rather unlikely that Poland could create immediate radiation threat to a neighboring country. Also the NPPs in neighboring countries are not located in the close vicinity to Poland's borders. However appropriate arrangements has been made to be able to respond adequately to even very unlikely radiation emergency situation. According to the *Atomic Law* the NAEA President is responsible for performing the 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 National Atomic Energy Agency. 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.

Financial resources for safe decommissioning will be ensured by the state budget when decommissioning plan is going to be implemented.

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 are kept in facility (drawings, technology, physical state of spent fuel elements, waste stored inventory etc.).

The above statements are based also on the Poland's experience gained during the decommissioning of EWA research reactor (for more detailed information see **Annex 11**).

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 National Atomic Energy Agency. 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 general 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 8**), have to be fulfilled. Also the requirements of the *Council of Ministers regulation on radioactive waste and spent nuclear fuel*, have to be satisfied. 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 ion various types of repositories and their siting, operation, construction and closure.

Not all of seven issues of Article 4 of the Joint Convention are directly recognized by the Polish *Atomic Law Act* and secondary legislation within the licensing process for RAW and SF facilities. However the Convention itself, after its ratification by the President of Poland and being published in Polish version in the Polish Journal of Law, had became a part of national legal framework and as such is respected equally to the acts of Parliament. The criticality and heat removal issues (4i) are directly addressed in the art.30 of the governmental *regulation on radioactive waste and spent nuclear fuel* , issued on 3 Dec 2002. The minimalization of waste generation (4ii) and interdependencies (4iii) are not recognized directly by the *Atomic Law Act* and secondary legislation. Nevertheless those approaches have been always important elements of the waste management policy and practice, observed both by the licensees and the regulators. 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 then radiological (4v), in the situation when operations with spent fuel in Poland limited only to wet storage and preparation to dry storage by encapsulation of fuel elements without des-integrating them, 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 Chapter VI of *Regulation on radioactive waste and spent nuclear fuel*.

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.

Spent fuel storage facilities no19 and 19A and MARIA reactor interim storage pool.

The investigations on the technical state of spent fuel elements, temporarily stored in the water ponds of storage facilities no 19 and 19A as well as of the MARIA reactor, performed within the Strategic Governmental Programme, showed the corrosion of cladding material and releases of fission products. RWMP was granted with appropriate license on equipment and technology for encapsulation of first batches, containing EK-10 elements with the longest wet storage presence, that have been successfully encapsulated (see Annex 2 for details). On the other hand in years 2003-2007 ca. 160 MR fuel elements have been encapsulated by IAE (96 of those elements have been transferred do 19a storage facility).
Nevertheless works connected with construction of dry storage facility and further encapsulation of MR fuel were frozen, as its future development depends on final decisions regarding scope of RRRFR initiative.

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.

If decision regarding creation of dry storage facility is taken, building of former EWA reactor at Świerk Centre will be used as location. Relevant information will be provided to the public as well as the consultations performed with Parties concerned, if required.
Requirements connected with siting of radioactive waste repository that are established in Atomic law and supporting Council of Ministries regulation 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 include providing 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 NAEA Department for Radiation and Nuclear Safety. Engineering and technical support is provided if necessary. Operating experience is documented and reported to the NAEA. 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. 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 the great number of cracks. The deposit of homogenous clay rocks and 3 salt dams fulfilling siting criteria were chosen for further examination.

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:

- ***i. ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;***
- ***ii. ensure that the generation of radioactive waste is kept to the minimum practicable;***
- ***iii. take into account interdependencies among the different steps in radioactive waste 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 radioactive waste 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 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 8**), have to be fulfilled. Also the more detailed provisions of the *Council of Ministers regulation on radioactive waste and spent nuclear fuel*, have to be satisfied. 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, the releases of tritium have been observed. Therefore, an appropriate actions has been undertaken to monitor the situation development and planned to improve storage conditions with aim to diminishing of further tritium release.
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 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.

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.***

All above requirements were strictly observed during preparation of the safety report for the final closure of the Różan repository (see **Annex 4**) and will be followed when new waste management facilities will be sited.

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.

The technical criteria and requirements regarding the design and construction of radioactive waste management facility will 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. The licences 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 NAEA Department for Radiation and Nuclear Safety for review. Engineering and technical support is provided if necessary. Operating experience is documented and reported to the NAEA. Incidents are notified through established emergency channels.

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 planning that the Różan repository will operate until 2020. On the basis of updated safety report for final closure of the repository, 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

Last amendment of Atomic Law from 11th of April 2008 (O.J. No. 93 Item 583) will enter into force on 25th December 2008 and will have significant influence on formal structure of legislation related to transboundary movement oversight. Article 62. p.4.2 & p.4.3 and regulations issued on their basis **will be revoked** - that means 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.*

In practice both above mentioned regulations will be replaced by newly created “Chapter 8a” of Atomic law regulating all issues connected with transboundary movements and implementing relevant European Commission directives

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.

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.

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 return to the foreign manufacturer form the separate category of waste and are safely stored by the RWMP.

SECTION K. PLANNED ACTIVITIES TO IMPROVE SAFETY

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

- exportation of existing spent fuel from Polish research reactors to Russian Federation;
- continuation of works connected with siting and construction of new radioactive waste repository to take over the duties of Różan repository;
- continuation of works connected with construction of dry storage facility in building of former EWA RR;
- consideration of necessity for establishing of deep geological facility for final disposal of high level waste and spent fuel.

All these areas have many interdependences and final decisions in each case will be influenced by outcomes of other projects. Primarily the future of dry storage facility will depend on governmental decision regarding possible exportation of LEU EK-10 fuel. As it was mentioned in “Section A” Minister of Economy was obliged by Council of Ministries to prepare by the and of March 2009 new national strategy regarding radioactive waste management and spent fuel management which will take into account all relevant issues including possibility of embarking on nuclear power programme. At the moment (September 2008) not even draft version of this document in known to the authors of Report.

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SECTION L. ANNEXES

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Annex no.1

Nuclear sites in Poland

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 Institute of Atomic Energy in Świerk (IAE)**, is subject to process of its constant upgrading and accommodation to actual tasks. At present MARIA RR is at the beginning of conversion to LEU fuel. First LEU fuel elements will be put into reactor core for testing by the end of 2008.

Spent fuel from this reactor can be divided into three groups from storage method viewpoint:

- spent fuel elements stored in reactor technological pool for cooling (~200 elements);
- encapsulated SF elements stored in reactor technological pool (~60 elements);
- encapsulated SF elements transferred to 19A wet storage facility (96 elements).

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 (IAE)** - in 1997, recently has reached the end of its **2nd stage**, according to IAEA definition. The spent fuel unloading, decontamination and the majority of dismantling works were performed by IEA 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 NAEA 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**.

Both facilities as well as the water ponds containing spent fuel from above RRs (more than 5000 SF assemblies) are sited at nuclear research centre in Świerk , where also waste treatment and storage facilities for ILW and LLW are located. Spent sealed radioactive sources (SSRS) of high activity are also temporarily stored at Świerk. Another nuclear site in Poland is Różan Radioactive Waste Repository, for near-surface disposal of LILW institutional waste, SSRS and for interim storage of alpha waste.

Spent fuel facilities

Spent fuel from MARIA reactor is stored mainly in the MARIA reactor technological pool operated by IEA (**AR, wet**), however 96 encapsulated elements were transferred to wet storage facility 19A operated by RWMP. Spent fuel from other reactors and critical assemblies is stored in the 2 separated facilities (**AFR,wet**) at Świerk, operated by RWMP. No SF has ever been returned to the Russian supplier. Some fuel has been in interim wet storage since 1958. In 2007 and 2008 first batches containing elements with the longest wet storage presence has been successfully encapsulated. Further actions in this direction depends on development and scope of RRRFR programme.

Radioactive waste facilities

RWMP operates the following installations and facilities at Świerk site and Różan site:

Świerk:
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 ton), temporary storage facility.

Różan (the site was originally a military fort, converted to a repository in 1961)
Near-surface repository / storage. 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.
It is currently the only radioactive disposal site available in Poland. It is likely that another site for a national repository for future waste arising will eventually have to be found. Indeed, in 1999 Poland completed a three-years Strategic Governmental Programme covering all aspects of present and possible future radioactive waste management in the country. Not only did this deal with the siting issue regarding a replacement for the Różan facility but also considered the waste implications on a future national nuclear power programme (i.e. deep geological repository). This detailed examination of areas suitable for near surface repository siting resulted in 19 sites being chosen for *in-situ* geological investigations. Unfortunately no progress in this area has been done since last review meeting (2005).

Uranium mining

Most mining activities took place in the south-west of the country. Mining of ore ended in 1968, and processing was terminated in 1973. There are some 100 dumps, mostly abandoned, of waste rock and ore totalling approximately 1.4×10^6 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 no. 2

"Radioactive Waste and Spent Fuel Management in Poland" -
The Governmental Strategic Programme Scope and Developments

The Programme consisted of 9 mutually inter-linked undertakings and 4 research and development projects and resulted in the following developments in 6 areas of interest highlighted below:

- ***Legislative work***

  The aim of legislative work was to achieve full coherence of national regulations concerning the management of radioactive waste and spent fuel with the regulations of European Union, taking into account, as far as possible, the International recommendations. Moreover, the legislative work was aiming at creation of the organisation system for waste management in conformity with the European standards.

Regulations (on the level of parliamentary bill and that of executive regulations) on the management of radioactive waste and spent nuclear fuel have been prepared – in accordance with the EU requirements and IAEA guidelines as well as with the Joint Convention requirements. Moreover, the work resulted in creation legislative framework provided for changes in an organisation system for waste management in conformity with the European standards.

- ***Conception of closing of Różan repository.***

  The purpose of this undertaking was the elaboration of variant conception of closing of Różan repository.

A conception for the closure of the current disposal facility in Różan has been prepared in six variants, where the basic ones involved a multi-layered soil cover, a concrete cap and a partial or total evacuation of collected waste. Appropriate analyses of safety and environmental impact have been performed.The choice of variant and the realisation of the chosen conception will be done after the decision of closing the repository. This decision depends on the technical possibilities of site operation and on the further acceptance of local community. According to present concepts **the operation of Różan repository should be continued as long as possible, provided that all safety conditions be fulfilled.**

- ***Conception of further management of spent fuel from Polish research reactors***

  The R&D project conducted with reference to the spent fuel included the following items: characterisation of the existing inventory of fuel as a function of fuel type, age in storage and burn-up, characterisation of the physical conditions of the fuel (underwater video records and eventually ultrasonic characterisation of pitting profiles), identification of leaking fuel elements (sipping tests), development of technology for encapsulation of damaged fuel elements, definition of criteria of extended interim storage, recommendation to the Government on final solution.

The investigation of the state of some chosen spent fuel elements used in EWA and MARIA reactors showed that their long-term storage in water environment led to cladding surface degradation, caused by corrosion. In case of some fuel elements this process leads to leaks of fission products into storage facility water environment. Using the results from spent fuel research, a more detailed conception for dry storage of such fuel has been prepared, involving the building of decommissioned EWA reactor and some of its equipment[6]. Further actions in this direction depends on development and scope of RRRFR programme.

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

• Siting activities for the near-surface repository for low and medium activity waste.

The first step of the work comprised:

- *the elaboration of detailed siting criteria for the near-surface repository of radioactive waste,*
- *the review of several repository sitings proposed earlier and reinterpretation of the data,*
- the elaboration of geological characteristics (basing on archival materials) for the regions proposed for siting, according to social and economic analysis;

In the second step the more detailed examination of areas with perspective for repository siting has been performed.The boreholes and hydrogeological examinations have been done for 16 sites. Altogether, 50 boreholes were made down to the depth of 15 m.

As a result of the analysis of these areas, 19 sites situated in 12 communes were chosen for geological research *in situ*. The selection of the most promising regions was performed. Unfortunately, the acceptance of local authorities for siting the repository until the end of the project was not gained and no progress in this area has been done since last review meeting (2006).

• Siting activities for the repository in deep geological formations.

In the frames of SGP the following works have been done:

- *criteria for the siting of future Polish repository for HLW and SNF have been elaborated;*
- *inventory of deep mines existing in Poland has been done and the possibility of their use, after closing, as radioactive waste repositories has been examined. (such a solution is economically very advantageous. However, after the examination of existing Polish mines it was concluded, that none of them would suit the purpose).*
- *review of geological structure of the country has been done, from the point of view of possible potential sites for future repository. 44 rock structures were chosen for preliminary analysis, comprising:*
  - *magma and metamorphic rocks – 17*
  - *clay formations – 7*
  - *salt deposits – 20*

It was found that granite bedrocks in Poland are not suitable for repository placing due to the great number of cracks.
The deposit of homogenous clay rocks ca. 200 m thick in basin Kotlina Przedsudecka was assigned to further examinations.
Also 3 salt deposits (domes) (Damasławek, Łanięta and southern part of Kłodawa deposit), fulfilling siting criteria were chosen for further examination. Unfortunately no progress in this area has been done since last review meeting (2006).

• 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

Governmental Strategic Programme: "Radioactive waste and spent fuel management in Poland" provided, apart from the solving of several current problems of securing the continuity of safe and effective radioactive waste management, 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.**
The possible methods of future solution of long-lived radioactive waste problem have been studied. The present status of knowledge permits the statement that the transmutation method gives a far-sighted option for the solution of this problem. The main argument in its favor is the possibility of using the enormous energy reserves remaining in spent nuclear fuel. At the same time one should stress that the present level of technological development

allows to expect that it will be possible to implement this method on an industrial scale in 2-3 decades. The rational continuation of further research on transmutation in Poland essentially will depend on the increase of research potential and on increased financial resources.
In April 2008 Council of Ministers obliged Minister of Economy (in cooperation with Minister of Treasury – supervisory body of Radioactive Waste Management Plant) to prepare document describing new national strategy regarding radioactive waste management and spent fuel management. Taking into account that decision regarding embarking on nuclear power programme is still under discussion document shall consider two options: “nuclear” and “non-nuclear”. Document is expected to be published by the end of 1st quarter of 2009.

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Annex no.3

Development of facility for interim storage of encapsulated spent fuel on the site of the decommissioned EWA reactor.

During operation of EWA reactor at Świerk different fuel elements like EK-10 and WWR have been deployed. The spent fuel elements are stored under water in the two storage ponds in building 19 and 19A. Periodic quality inspections ensure the safety of the stored fuel elements. Corrosion on the surface of the fuel elements surface was find due to these inspections.
This fact led to the decision to build a dry storage in the former vault of EWA reactor. In the year 2004 the project was launched to develop technology and to construct a facility in EWA reactor building to start encapsulation of spent fuel from this reactor. This project was co-financed by European Commission within PHARE contract with German company BBN (Babcock Noell Nuclear GmbH).
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.
Hot cell used for encapsulation of spent fuel elements of EK-10 type is located in the EWA reactor 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 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.
Up to September 2008 the number of 896 EK-10 type spent fuel rods were encapsulated in to 32 capsules. Encapsulation of 924 rods of EK-10 type is planned up to the end of 2008. Total number of EK-10 rods to be encapsulated by the end of 2009 is 2595.
Because the new dry storage is not yet constructed the encapsulated elements are returned to the ponds in the facility no.19 and 19A.

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Annex no. 4

EU PHARE project – „Improvement of storage conditions and closure of the National Radioactive Waste Repository – Różan"

General objective of the project was to increase the safety of the Różan repository and its further operation until 2020. Main efforts focused on the preparation of up-dated safety report for renewal for the license for the operating phase and the safety report for closure and post-closure phase of the repository. The scope of the project has been covered by the Tasks 1 ÷ 10 listed below. More detailed description of project implementation was given in two 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 - Up-dating 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

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Annex no. 5

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	10^3
Tc-97	10^8	10^3
Tc-97m	10^7	10^3
Tc-99	10^7	10^4
Tc-99m	10^7	10^2
Ru-97	10^7	10^2
Ru-103	10^6	10^2
Ru-105	10^6	10
Ru-106+	10^5	10^2
Rh-103m	10^8	10^4
Rh-105	10^7	10^2
Pd-103	10^8	10^3
Pd-109	10^6	10^3
Ag-105	10^6	10^2
Ag-108m+	10^6	10
Ag-110m	10^6	10
Ag-111	10^6	10^3
Cd-109	10^6	10^4
Cd-115	10^6	10^2
Cd-115m	10^6	10^3
In-111	10^6	10^2
In-113m	10^6	10^2
In-114m	10^6	10^2
In-115m	10^6	10^2
Sn-113	10^7	10^3
Sn-125	10^5	10^2
Sb-122	10^4	10^2
Sb-124	10^6	10
Sb-125	10^6	10^2
Te-123m	10^7	10^2
Te-125m	10^7	10^2
Te-127	10^6	10^3
Te-127m	10^7	10^3
Te-129	10^6	10^2
Te-129m	10^6	10^3
Te-131	10^5	10^2
Te-131m	10^6	10
Te-132	10^7	10^2
Te-133	10^5	10
Te-133m	10^5	10
Te-134	10^6	10
I-123	10^7	10^2
I-125	10^6	10^3
I-126	10^6	10^2
I-129	10^5	10^2
I-130	10^6	10
I-131	10^6	10^2
I-132	10^5	10
I-133	10^6	10
I-134	10^5	10
I-135	10^6	10
Xe-131m	10^4	10^4
Xe-133	10^4	10^3
Xe-135	10^{10}	10^3
Cs-129	10^5	10^2
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	10^2
Ba-140+	10^5	10
La-140	10^5	10
Ce-139	10^6	10^2
Ce-141	10^7	10^2
Ce-143	10^6	10^2
Ce-144+	10^5	10^2
Pr-142	10^5	10^2
Pr-143	10^6	10^4
Nd-147	10^6	10^2
Nd-149	10^6	10^2
Pm-147	10^7	10^4
Pm-149	10^6	10^3
Sm-151	10^8	10^4
Sm-153	10^6	10^2
Eu-152	10^6	10
Eu-152m	10^6	10^2
Eu-154	10^6	10
Eu-155	10^7	10^2
Gd-153	10^7	10^2
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	10^2
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	10^2
Re-186	10^6	10^3
Re-188	10^5	10^2
Os-191m	10^7	10^3
Os-193	10^6	10^2
Ir-190	10^6	10
Ir-192	10^4	10

Isotope	Activity [Bq]	Activity concentration [kBq/kg]
1	2	3
Ir-194	10^5	10^2
Pt-191	10^6	10^2
Pt-193m	10^7	10^3
Pt-197	10^6	10^3
Pt-197m	10^6	10^2
Au-198	10^6	10^2
Au-199	10^6	10^2
Hg-197	10^7	10^2
Hg-197m	10^6	10^2
Hg-203	10^5	10^2
Tl-200	10^6	10
Tl-201	10^6	10^2
Tl-202	10^6	10^2
Tl-204	10^4	10^4
Pb-203	10^6	10^2
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+	10^8	10
Ra-223+	10^5	10^2
Ra-224+	10^5	10
Ra-225	10^5	10^2
Ra-226+	10^4	10
Ra-227	10^6	10^2
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	10^2
U-230+	10^5	10
U-231	10^7	10^2
U-232+	10^3	1
U-233	10^4	10
U-234	10^4	10
U-235+	10^4	10
U-236	10^4	10
U-237	10^6	10^2
U-238+	10^4	10
U-238nat	10^3	1
U-239	10^6	10^2
U-240	10^7	10^3
U-240+	10^6	10
Np-237+	10^3	1
Np-239	10^7	10^2
Np-240	10^6	10
Pu-234	10^7	10^2
Pu-235	10^7	10^2
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	10^2
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	10^2
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	10^2
Cf-254	10^3	1
Es-253	10^5	10^2
Es-254	10^4	10
Es-254m	10^6	10^2
Fm-254	10^7	10^4
Fm-255	10^6	10^3

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Activity of isotopes in the waste stored/disposed at NRWR – Różan in the years 1961 – 31.08.2008 (*)

Annex no.6/page 1

Isotope	Initial activity [MBq]	Activity on 31.08.2008 [MBq]	Volume [m^3]	Mass [t]
Ir-192	87 627 337	792 579	1 005,37	1 026,24
Co-60	57 552 910	4 749 436	1 921,77	2 252,96
I-125	27 027 765	80	1 305,27	1 312,79
Cs-137	24 361 334	13 348 009	1 628,04	1 748,83
S-35	13 822 030	556	110,73	82,23
H-3	6 349 645	2 860 090	461,44	368,86
Po-210	5 893 123	0	23,74	14,79
Pu-239	4 174 336	4 172 638	260,92	372,72
Am-241	3 542 435	3 489 443	122,62	183,87
Zn-65	1 859 041	1 588	109,28	94,78
Ce-144	1 570 107	54 592	160,86	207,22
P-32	1 568 290	0	132,68	96,20
Sr-90	1 421 261	798 369	150,58	117,41
Cr-51	1 410 285	4	124,37	89,73
Yb-169	1 373 997	0	5,02	4,12
U-238	1 254 184	1 254 184	170,52	167,08
Pu-238	997 362	915 966	58,91	50,34
Ra-226	716 414	710 892	367,37	350,46
Kr-85	650 876	280 143	6,98	8,25
C-14	527 852	526 586	394,51	296,34
Nb-95	339 703	1	55,72	51,12
Ce-141	321 522	0	55,24	44,50
Tl-204	319 642	8 806	22,92	23,06
Na-24	275 093	0	5,59	5,65
I-131	263 513	0	219,83	165,24
Zn-69	262 904	0	3,60	4,93
Cs-134	237 314	26 117	82,10	84,23
Eu-152	213 741	54 706	181,51	213,29
Pm-147	210 920	9 302	9,23	9,35
Eu-154	207 322	24 204	16,35	16,21
Y-90	197 449	0	10,27	8,20
Tc-99m	180 168	0	174,53	124,77
Zr-95	176 114	23	73,24	68,59
U-236	153 480	153 480	0,48	0,40
Ru-106	150 819	11 800	99,82	151,65
Mo-99	136 851	0	24,23	20,11
Fe-59	129 825	27	24,74	21,11
Tm-170	129 240	0	2,96	0,77
Cm-242	111 000	0	0,36	0,47
Mn-54	61 160	763	9,85	8,36
Ni-63	51 435	47 025	10,19	12,64
Sn-113	47 471	0	14,84	11,08
Ca-45	30 846	0	60,28	46,03

Activity of isotopes in the waste stored/disposed at NRWR – Różan in the years 1961 – 31.08.2008 (*)

Annex no.6/page 2

Isotope	Initial activity [MBq]	Activity on 31.08.2008 [MBq]	Volume [m^3]	Mass [t]
Sb-124	30 331	104	55,57	42,67
Th-232	28 671	28 671	66,02	114,18
Sr-89	23 060	82	33,25	21,02
Fe-55	22 464	826	5,54	4,63
Ru-103	21 885	0	33,44	30,69
Sb-125	21 567	9 646	23,38	34,65
Ag-110	20 338	0	9,50	3,42
Cm-244	19 859	17 742	0,17	0,26
Se-75	17 744	101	4,43	4,50
Pb-210	17 161	4 476	12,43	10,07
Lu-172	16 175	0	2,40	1,60
Th-230	13 627	13 623	44,60	91,25
Sc-46	13 615	0	3,00	0,97
I-123	10 240	0	2,30	1,59
Co-58	9 876	0	2,65	2,24
K-40	7 585	7 585	10,73	4,83
Co-57	6 835	167	37,16	43,68
Cu-64	5 813	0	1,75	0,84
Cl-36	5 648	5 648	15,49	14,69
Rb-86	5 590	0	1,40	0,99
Ir-190	5 550	0	0,05	0,05
Cd-109	5 397	303	23,50	40,63
Hf-181	5 000	0	0,01	0,01
Pm-145	5 000	2 878	5,00	5,20
Cf-252	4 252	1 102	0,52	0,55
Re-188	3 835	0	2,60	1,79
Sb-122	3 337	0	16,20	11,86
La-142	3 238	0	0,40	0,80
Na-22	2 243	82	43,00	53,61
Kr-90	1 850	0	0,25	0,04
U-235	1 423	1 423	3,29	4,01
Te-123m	1 330	28	1,60	4,00
Sr-85	1 162	0	5,65	3,98
Hg-203	1 131	0	2,26	1,74
Ta-182	981	0	0,01	0,01
Cd-115	930	0	8,25	6,08
I-124	925	0	0,01	0,06

Activity of isotopes in the waste stored/disposed at NRWR – Różan in the years 1961 – 31.08.2008 (*)

Isotope	Initial activity [MBq]	Activity on 31.08.2008 [MBq]	Volume [m^3]	Mass [t]
Gd-153	922	0	6,85	4,49
Xe-133	759	0	,55	0,12
Ba-133	750	452	81,95	139,02
Te-127	749	0	3,30	6,80
Re-186	740	0	0,20	0,11
Ca-47	740	0	0,24	0,14
Sr-92	740	0	0,10	0,05
Mn-56	740	0	0,20	0,01
Hg-197	740	0	0,50	0,07
Lu-177	652	0	5,60	3,68
U-233	550	550	1,25	0,56
I-121	500	0	0,20	0,14
Te-127m	499	7	1,60	4,00
Np-237	484	483	1,25	0,58
Ga-67	469	0	9,20	5,13
Ba-140	331	0	25,40	16,29
As-77	264	0	0,20	0,06
Sm-153	166	0	2,40	1,47
Te-121m	133	7	1,60	4,00
Br-82	111	0	0,03	0,02
Rh-106	74	0	0,06	0,50
Ce-143	40	0	0,05	0,02
Bi-207	21	16	0,80	0,67
Cd-115m	20	0	2,25	1,80
La-140	16	0	7,00	7,13
Te-121	15	0	1,60	4,00
W-188	10	0	2,60	1,90
W-185	9	0	0,15	0,03
Be-7	9	0	0,21	0,25
As-74	9	0	0,21	0,25
Rb-84	7	0	0,20	0,99
U-234	7	7	0,20	0,15
Lu-177m	6	0	1,60	0,98
In-111	2	0	0,60	0,37
Total:	**248 265 010**	**34 388 100**		

(*) after correction data in waste inventory database

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Annex no.7

International conventions related to safe utilization of atomic energy and safeguards of nuclear materials signed, ratified and implemented by Poland

(1) Convention ILO 115 on Workers Protection against Ionising Radiation, *ratified in1965*

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 (NAEA) 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), Ukraina (1993), Belarus (1994), Russian Federation (1995), Lithuania (1995) Slovak Republic (1996) and Czech Republic (2005); 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 NAEA 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 Ministrer 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

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Annex no. 8

Summary of the new Act of Atomic Law, as amended on 11th April 2008

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 2001-2008. Last amendment was published in Official Journal No. 93, Item 583 on 30th May 2008 and will enter into force on 25th December 2008.

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. The list of definitions of terms has been extended by those connected with the high activity sealed sources and medical exposure , also some old definition has been improved for example term "quality assurance programme" has been literally included in Atomic 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 individuals, 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"* places the responsibility for nuclear and radiological safety on manager of the organization which is operating a nuclear facility, and addresses the questions of licensing and establishing of the restricted areas around such facility, as well as formulates the right for the NAEA President to curtail or suspend the operation of nuclear facility when nuclear safety may be endangered;

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 NAEA President prior their commencement. It defines also other NAEA 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 inspections performed by NAEA, 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 manager of the organizational unit which is handling wastes, and addresses the questions of wastes disposal and of the necessary protection of humans and of the environment.

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 NAEA 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. This chapter will replace two Council of Ministers regulations to be revoked on 25th December 2008 (*on the issuing of the permits for the import to, export from, and transit through the territory of Poland of radioactive waste* and *on the issuing of the permits for the import to, export from, and transit through the territory of Poland of spent nuclear fuel*).

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 organs, introduces enforcement measures, and sets up qualification requirements with regard to inspectors of the regulatory body;

Chapter 10 entitled “National radiation situation assessment” obliges the NAEA 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 NAEA 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 NAEA 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 150 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.

Chapter 13 entitled “The President of the National Atomic Energy Agency” states that the President of the NAEA 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 NAEA 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. In addition, this chapter introduces a NAEA President’s consulting and opinion-giving body, “Council for Atomic Affairs” , whose Chairman is to be proposed by the NAEA President and nominated by the Prime Minister.

Chapter 14 entitled “State-owned public utility “Radioactive Waste Management Plant” establishes the above named plant as a legal personality while the supervision over the plant is placed under responsibilities of the minister competent in State Treasury matters, 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.

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

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Annex no. 9

Executive Regulations to the Act of Atomic Law.

Regulations by the Prime Minister and the Council of Ministers

2001

- *Council of Ministers regulation on nuclear materials subject to accounting,(Art. issued on 31.07.2001, Official Journal of Laws ("Dziennik Ustaw 2001")no.87 item 955, in force since 01.01.2002 (replaced by the new regulation in 2004 and repealed in 2005)*
- Council of Ministers regulation on physical protection of nuclear materials, issued on 31.07.2001, OJ(Dz.U. 2001) no.90 item 997, in force since 01.01.2002 (replaced 2004)
- Council of Ministers regulation on rules and procedures governing the allocation, accounting and return of subsidies in connection with nuclear safety, issued on 3.12.2001, OJ (Dz. U. 2001) no.145 item 1626, in force since 01.01.2002, (replaced 2004) ;
- Prime Minister's regulation on the statute of the National Atomic Energy Agency (Art.113.1) issued on 7.12.2001, OJ (Dz. U. 2001) no.140 item 1576, in force since 14.01.2002; (replaced 2002)
- Prime Minister's regulation on the scope and procedures for the activities of the Council of Atomic Affairs , issued on 17.12.2001, OJ (Dz. U. 2001) no.153, item 1749, in force since 14.01.2002;

2002

- Council of Ministers regulation on ionizing radiation dose limits issued on 28.05.2002, OJ (Dz. U. 2002)no. 111, item 969, (rev. OJ 2003 no. 38 item 333), in force since 03.08.2002; (replaced 2005)
- 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, amended2004;
- Council of Ministers regulation on nuclear regulatory inspectors, issued on 06.08.2002, OJ (Dz. U. 2002), no 137, item 1154, in force since 12.09.2002;
- Council of Ministers regulation on basic requirements concerning controlled and supervised areas, issued on 06.08.2002. OJ (Dz. U. 2002) no. 138, item 1161, in force since 01.12.2002 (replaced 2007) ;
- *Council of Ministers regulation on posts being of primary importance for nuclear safety and radiological protection, and on radiation protection officers, issued on 06.08.2002, OJ (Dz. U. 2002) no 145, item 1217,(rev. OJ 2003 no. 38 item 333), in force since 11.12.2002,(replaced 2005);*
- Council of Ministers regulation on the values of intervention levels and levels of radioactive substances contents in foodstuffs, feedingstuffs and potable water contaminated as a result of a nuclear accident, issued on 06.08.2002, OJ (Dz. U. 2002), no 145, item 1218, in force since 01.01.2003, (replaced 2004) ;
- Council of Ministers regulation on accountability procedures for the subsidy allocated from the national budget for radioactive waste management and spent nuclear fuel management, and detailed rules for finances management of the State-owned public utility named "Radioactive Waste Management Plant"

issued on 24.09.2002, OJ (Dz. U. 2002), no 163, item 1344, in force since 17.10.2002 ;

- Council of Ministers regulation on radiation protection of external workers exposed in controlled areas, issued on 05.11.2002, OJ (Dz. U. 2002), no 201, item 1693, in force since 01.01.2003,; (replaced 2004)
- Council of Ministers regulation on requirements for individual dose registering, issued on 05.11.2002, OJ (Dz. U. 2002), no 207, item 1753, in force since 01.01.2003; (replaced 2007)
- Council of Ministers regulation on conditions governing import export and transit through the territory (of Poland) of nuclear materials, radioactive sources and equipment containing such sources, issued on 05.11.2002, OJ (Dz. U. 2002), no 207, item 1754, in force since 01.01.2003, (replaced 2004) ;
- 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 or spent nuclear fuel issued on 05.11.2002, OJ (Dz. U. 2002), no 215, item 1817, in force since 01.01.2003, (replaced 2004)
- Council of Ministers regulation on natural radioactive isotope content in specified materials used in the buildings and in construction industry, as well as on controlling of the content of such isotopes, issued on 03.12.2002, OJ (Dz. U. 2002), no 220, item 1850, in force since 01.01.2003, (replaced 2007);
- 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);
- 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 detailed conditions for safe handling of radiation sources, issued on 17.12.2002, OJ (Dz. U. 2002), no 239, item 2029, in force since 01.01.2003 (replaced 2006);
- 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;
- Council of Ministers regulation on radiological emergency preparedness plan on national and local levels, issued on 23.12.2002, OJ (Dz. U. 2002), no 239, item 2033, (rev. OJ 2003 no. 38 item 333), in force since 01.01.2003, (replaced 2005);

2003

- Prime Minister's regulation on the procedures for control and inspections of the Internal Security Agency and of the Intelligence Agency conducted by the nuclear regulatory body inspectors (art.63), issued on 20.02.2003, OJ (Dz. U. 2003), no 38, item 330, in force since 20.03.2003;

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 particular obligations related to safeguard of nuclear materials (Art.42.1), issued 27.04.2004 OJ (Dz. U. 2004) no. 98 item 982, in force since 01.05.2004 - replaced former regulation on nuclear materials subject to accounting, no.87/ 955 - 31.07.2001 (repealed 24.02.2005).
- Council of Ministers regulation on physical protection of nuclear materials (Art.42.2), issued 27.04.2004 OJ (Dz. U. 2004) no. 98 item 983, in force since 01.05.2004 - replaced former regulation no.90/997 - 31.07.2001. ,
- Council of Ministers regulation on conditions governing import export and transit through the territory (of Poland) of nuclear materials, radioactive sources and equipment containing such sources (Art.62.4 p.1), issued 27.04.2004 OJ (Dz. U. 2004) no. 98 item 984, in force since 01.05.2004 - replaced former regulation no.207/1754 - 05.11.2002, (replaced 2007)
- 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 (Art.62.4 p.2) , issued 27.04.2004 OJ (Dz. U. 2004) no 98 item 985, in force since 01.05.2004 - replaced a part of former regulation no.215/1817 - 05.11.2002
- 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 , (Art.62.4 p.3) , issued 27.04.2004 OJ (Dz. U. 2004) no 98 item 986, in force since 01.05.2004 - replaced a part of former regulation.no.215/1817 - 05.11.2002(replaced 2007)
- 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 - replaced former regulation no. 145/1218 - 06.08.2002 and its amendment no.151/1463-2003.
- 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 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
- 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 - replaced former regulation no.201/1693 - 05.11.2002) .

- Council of Ministers regulation on the rules of subsidizing the tasks enhancing of nuclear and radiation safety in performing particular activities involving risk from radiation (Art.33.5) issued 28.09.2004 OJ (Dz. U. 2004) no 224 item 2272, in force since 01.01.2005 - replaced former regulation no.145/1626 - 03.12.2001; (replaced 2006)

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 - replaced former regulation no. 111/969 - 25.05.2002 and its amendment no.38/333-2003;
- 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- replaced former regulation no. 239/2033 - 23.12.2002 and its amendment no.38/333-2003;
- Council of Ministers regulation on the posts being of primary importance for the nuclear safety and radiation protection, and on the regime and procedures to be followed in the granting of authorization indispensable for holding such post (Art.12.2) issued 18.01.2005 OJ (Dz. U. 2005) no 21 item 173, in force since 01.02.2005 - replaced former regulation no. 145/1217 - 06.08.2002 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
- Council of Ministers regulation on the rules of subsidizing the tasks enhancing of nuclear and radiation safety in performing particular activities involving risk from radiation (Art.33.21) issued 28.12.2006 OJ (Dz. U. 2004) no 251 item 1849, in force since 01.01.2007- replaced former regulation no. 224 /2272 - 28.09.2004;

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 the issuing of the permits for the import to, export from, and transit through the territory of Poland of spent nuclear fuel, (Art.62.4 p.3), issued 30.01.2007 OJ (Dz. U. 2007) no 24 item 145, in force since 12.02.2007 - replaced former regulation no. 98/986 - 27.04.2004

- Council of Ministers regulation on basic requirements concerning controlled and supervised areas, issued on 20.02.2007. OJ (Dz. U. 2007) no. 131, item 910, in force since 07.08.2007; replaced former regulation no. 138/1161 - 06.08.2002.
- Council of Ministers regulation on conditions governing import export and transit through the territory (of Poland) of nuclear materials, radioactive sources and equipment containing such sources (Art.62.4 p.1), issued on 20.02.2007. OJ (Dz. U. 2007) no. 131, item 911, in force since 07.08.2007; - replaced former regulation no.98/984 – 01.05. 2004,
- 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,

Regulation of the Ministry of Environment:

- Minister of Environment Regulation on the statute of the National Atomic Energy Agency establishing its internal organization, (art.113.1) issued on 15.07.2002, Polish Regulations' Bulletin (M.P. 2002), no 33, item 519, in force since 15.07.2002 (substitutes former Prime Minister reg.140/1576- 7.12.2001)
- Minister of Environment Regulation on detailed rules for the creation of restricted area surrounding nuclear facility (art.38.2), issued on 30.12.2002, OJ (Dz. U. 2002), no 241, item 2094, in force since 01.01.2003;

Regulation of the Ministry of Internal Affairs:

- Minister of Internal Affairs regulation on the implementation procedures for Atomic Law in Police, State Fire Guard, Border Guard and the organizational units subordinated to the Ministry of Internal Affairs (Art. 132), issued on 26.03.2002, Official Journal of the Ministry of Internal Affairs and Administration no.3, item 7, in force since 12.04.2002.

Regulation of the Ministry of National Defence

- Regulation no.51/MON on the implementation procedures for Atomic Law in organizational units subordinated to the Minister of National Defense (art.132), issued on 17.09.2003 Official Journal of the Ministry of National Defense no.15 item 161, in force since 1.10.2003.

Regulation of the Ministry of Finances

- Minister of Finances Regulation on obligatory third party liability insurance of nuclear installation operator (art.103.4), issued on 23.04.2004, OJ (Dz. U. 2004) no 94 item 909, in force since 01.05.2004;

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Annex no. 10

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 on 28 May 2002, and has been recently updated. The last version, issued 18.01.2005 (OJ no 20 item 168, in force since 01.02.2005) - **replaced former regulation** no. 111/969 - 25.05.2002 and its amendment no.38/333-2003. 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 50mSv 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.

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 NAEA 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 NAEA 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.

Annex no.11

Decommissioning of the EWA research reactor in Poland

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, supplemented with latest status of encapsulation facility and dry storage, will be given.

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 a well as technological instructions and procedures have been strictly respected. This resulted in very low doses recorded. In opinion of the NAEA the rules and regulations existing in Poland allow ensuring the realistic planning and safe implementing and accomplishing the decommissioning programmes for research reactors. For this reason it is not foreseen to introduce in nearest future regulations dedicated specially for decommissioning.

Currently works related to creation of encapsulation facility in a building of former EWA RR has been successfully completed and RWMP was granted with appropriate license on equipment and technology for encapsulation. First batches containing EK-10 elements with the longest wet storage presence has been successfully encapsulated. Nevertheless works connected with construction of dry storage facility were frozen, as its future development depends on final decisions regarding scope of RRRFR initiative and possible embarking on nuclear power programme.