PAA
NATIONAL ATOMIC ENERGY AGENCY

Annual Report

ACTIVITIES OF THE PRESIDENT OF NATIONAL ATOMIC ENERGY AGENCY (PAA) and ASSESSMENT OF NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION IN POLAND

2013

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ACTIVITIES OF THE PRESIDENT
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AND RADIOLOGICAL PROTECTION IN POLAND
IN 2013

NATIONAL
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AGENCY

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The headquarters of the National Atomic Energy Agency

INTRODUCTION

Dear Reader,

In submitting this report concerning the activities of the President of National Atomic Energy Agency for the previous year, I would like to state clearly that from the viewpoint of nuclear safety and radiological protection, the inhabitants of Poland were in 2013 fully safe and the environment duly protected against negative consequences of ionizing radiation.

The annual report is not only a statutory obligation of the President of National Atomic Energy Agency but one of our information tools by means of which we can show to the general public how the nuclear regulatory authority functions and what are the priorities and principles of our activities.

In each and every matter that we address, nuclear safety and radiological protection has the absolute priority. Other principles, important from the point of view of a nuclear regulator, include institutional independence, transparency, effectiveness in enforcement of laws and hiring highly qualified staff members.

I wish to assure the Prime Minister that our performance priority in 2013 was the preparations for the implementation of Polish Nuclear Power Program which was approved by the Council of Ministers in January 2014.

I wish to underline once again that thanks to PAA efforts, inspections and measurements, Poland is a safe country in terms of nuclear safety and radiological protection.

Yours faithfully,

NATIONAL
ATOMIC ENERGY
AGENCY

I. PAA PRESIDENT AS CENTRAL BODY OF GOVERNMENTAL ADMINISTRATION FOR NUCLEAR SAFETY MATTERS

I. 1. LEGAL BASIS OF ACTIVITIES OF THE PAA PRESIDENT

President of the National Atomic Energy Agency (PAA) constitutes a central body of the governmental administration, competent for nuclear safety and radiological protection matters.
The Act of Parliament on Atomic Law of 29 November 2000 (Journal of Laws of 2012, Item 264 and Item 908) and its secondary legislation regulate the activities of the PAA President. Since 1 January 2002 minister competent for environmental matters has been supervising the PAA President. Pursuant to the provisions of the aforementioned Act, the scope of activities of the PAA President in 2012 included tasks that involved ensuring nuclear safety and radiological protection of Poland, in particular:

1) Preparation of draft documents related to national policies involving nuclear safety and radiological protection, taking into account the program for nuclear power development and both internal and external threats;
2) Exercising regulatory control and supervision over the activities leading to actual or potential ionizing radiation exposure of humans and the environment, including the issuance of decisions on licenses and authorizations connected with these activities;
3) Promulgation of technical and organizational recommendations concerning nuclear safety and radiological protection;
4) Performing the tasks involving the assessment 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;
5) Performing the tasks resulting from the obligations of the Republic of Poland concerning accountancy and control of nuclear materials, physical protection of nuclear materials and facilities, special control measures for foreign trade in nuclear materials and technologies, and from other obligations resulting from international agreements on nuclear safety and radiological protection;
6) Activities involving public communication, education and popularization, as well as the scientific, technical and legal information concerning nuclear safety and radiological protection, including the transmission of relevant information to the general public on ionizing radiation and its impact on human health and the environment, and on feasible measures to be implemented in the event of radiation emergency (from July 2011 with the exclusion of the promotion of the use of ionizing radiation, in particular promotion of nuclear power energy);
7) Cooperation with governmental and local administration authorities on matters involving nuclear safety, radiological protection, and on nuclear research issues in the field of nuclear safety and radiological protection;
8) Performing the tasks involving national and civil defence and the protection of classified information, which result from other regulations;
9) Preparation of the opinions concerning nuclear safety and radiological protection on the proposed technical activities involving peaceful uses of nuclear energy on behalf of governmental and local administration authorities;
10) Cooperation with appropriate foreign entities and international organizations on the issues provided for by the Act, and facilitating the contacts of Polish scientific and industrial entities with these organizations;
11) Developing the drafts of legal acts on the issues stipulated by the Act and conducting the process of establishing their final form, according to the procedures established in the working rules for the Council of Ministers;
12) Issuing opinions on the draft legal acts developed by authorized bodies;
13) Submitting to the Prime Minister annual reports on the activities of the Agency's President and the assessments of the status of national nuclear safety and radiological protection.

Since 1990, the settlement of claims submitted by former workers of Industry Plants R-1 ('ZPR-1') in Kowary has been the PAA President's additional duty (resulting from the fact that in the past the PAA President was a founding organ of the Nuclear Technology Applications Plant POLON). Until 1972 Industry Plants R-1 had been mining and preprocessing uranium ores. Pursuant to the Ordinance No 4 of the PAA President of 14 April 1992, the Office for Handling Claims of Former Workers of Uranium Ore Mining and Milling Facilities was established with its seat in Jelenia Góra for the purpose of providing legal service and regulating damage claims of the former workers of Industry Plants R-1 in Kowary and their families. The claims settled in 2012 consisted in the following payments:

- compensating benefits payable on a monthly basis to 10 individuals in the total amount of PLN 94,414;
- equivalent for coal allowance in kind – in accordance with the provisions of collective labour agreement – to 225 workers in the total amount of PLN 208,150. Starting from 2000, the Office has been fulfilling its statutory obligation to award and pay one-off damages to former soldiers who were compulsorily employed in the uranium ore mining plants while performing substitute military service. In 2012 there were no payments in connection with such claims.

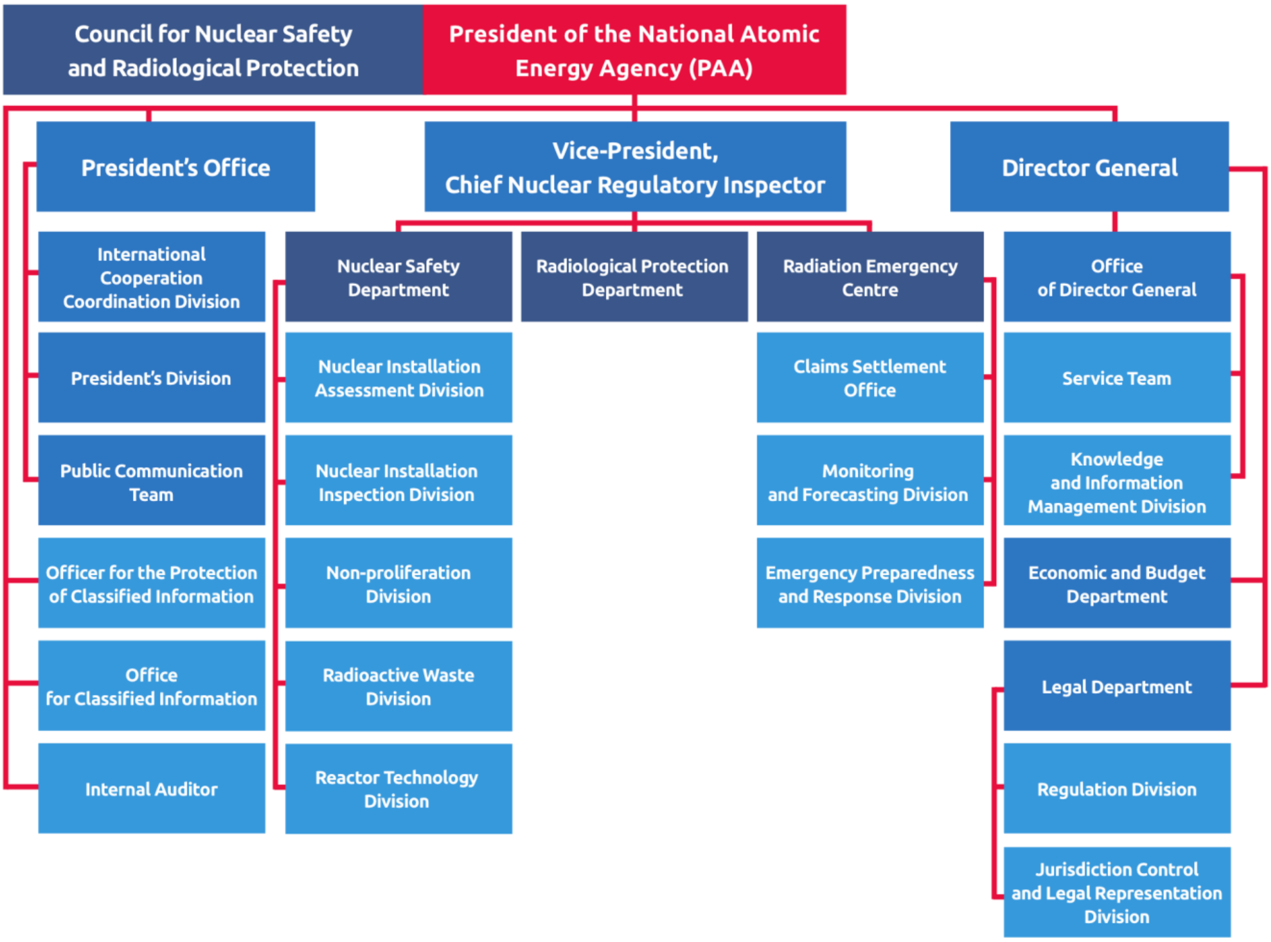
I. 2. NATIONAL ATOMIC ENERGY AGENCY (PAA) - organization

The PAA President fulfils his duties through the National Atomic Energy Agency which operates under his direct management. The internal organization of the PAA is set forth in the statute granted by the Minister of the Environment.

2.1. PAA's organizational structure

The statute of the PAA which is in force at present was granted by virtue of the Ordinance of Minister of the Environment No 69 of 3 November 2011. The PAA's detailed structure was laid down in the Ordinance No 4 of the PAA President of 4 November 2011 on the Organizational Rules of the National Atomic Energy Agency - PAA (Official Journal PAA No 2, Item 6). The organizational scheme of the Agency is shown in Figure 1.

Figure 1. Organizational scheme of the National Atomic Energy Agency in 2013 (PAA)



2.2. Employment at the PAA

The mid-year number of employees working at the PAA in 2013 amounted to 113 individuals (104.65 full-time employees), including 27 Nuclear Regulatory Inspectors.

2.3. PAA's budget

The PAA's budgetary expenses in 2013 amounted to PLN 152.2 million (Polish zloty), including:

- financing tasks of emergency service and national contact point acting within the framework of international nuclear accident notification system and national radiological monitoring – 1.4%,
- membership contributions due in connection with Poland's membership in the International Atomic Energy Agency, the Comprehensive Nuclear Test Ban Treaty Organization, the European Organization for Nuclear Research and Joint Institute for Nuclear Research – 90.5%,
- operating costs of the National Atomic Energy Agency (PAA) – 7.9%,
- other activities – 0.2%.

I. 3. COUNCIL FOR NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION

On the basis of Act of Parliament on Atomic Law of 29 November 2000 (in accordance with Article 112 Section 3) and the Regulation of the Minister of Environment of 18 November 2011, the Council for Nuclear Safety and Radiological Protection was established on 2 July 2012 as a body rendering advice and expertise support to the PAA President. It replaced in part the Council for Atomic Energy Matters, having a wide scope of activities, which was wound up as of 30 June 2012. The establishment of a new Council is a result of a change of priorities regarding the PAA President's activities which at present focus mainly on the oversight of nuclear facilities in Poland (for example MARIA research reactor) and planned construction of the nuclear power plant in accordance with the Polish Nuclear Power Program adopted by the Council of Ministers in January 2014 (see chapter II 2.1.).

3.1. Composition of the Council

The Council for Nuclear Safety and Radiological Protection is appointed by the PAA President. The Council consists of a chairman, deputy chairman, secretary and not more than 7 members appointed from among outstanding experts in the field of nuclear safety, radiological protection, physical protection, nuclear material safeguards and other disciplines which are important in terms of supervision over nuclear safety. Council's members must hold security clearances which authorize their holders to have access to classified information protected with a 'secret' clause.

The Chairman of the Council manages its activities. He/she represents the Council outside and prepares and forwards plans regarding the Council's activities for each calendar year at the Council's meeting.

The President of the National Atomic Energy Agency (PAA) by virtue of the Ordinance No 3 of 2 July 2012 (Official Journal of PAA, Item 3 and 4) established the Council for Nuclear Safety and Radiological Protection for its I term of office in the following composition:

Henryk Jacek Jezierski, Chairman of the Council,

Grzegorz Krzysztoszek, Deputy Chairman of the Council,

Andrzej Cholerzyński, Secretary of the Council,

Roman Jóźwik, Member of the Council,

Jerzy Wojnarowicz, Member of the Council,

and by virtue of the Order No 5 of 17 May 2013 (Official Journal of PAA of 2013 Item 5) the PAA President appointed as of 1 June 2013 professor **Janusz Janeczek** for a new member.

3.2. Tasks of the Council

Tasks of the Council include in particular issuing opinions following the request of the Agency's President with regard to draft versions of licenses for the conduct of activities involving exposure to ionizing radiation and consisting in the construction, commissioning, operation, and decommissioning of nuclear facilities, and also draft version of legal acts and organizational and technical recommendations, and submitting initiatives concerning improvements in supervision over activities involving exposure.

In 2013 there were eight meetings of the Council that is: two in January, February, April, May, June, and two in October.

In 2013 the Council adopted in a vote three resolutions in the form of amendments in the following annexes:

1. Regarding the issue of opinion on a draft annex No 9/2013/MARIA to the license of the President of National Atomic Energy Agency No 1/2009/MARIA of 31 March 2009 (with later amendments: Annex No 1/2009/MARIA of 6 August 2009, Annex No 2/2009/MARIA of 12 October 2009, Annex No 3/2010/MARIA of 21 January 2010, Annex No 4/2010/MARIA of 12 February 2010, Annex No 5/2010/MARIA of 10 March 2010, Annex No 6/2010/MARIA of 10 March 2010, Annex No 7/2010/MARIA of 16 July 2010, Annex No 8/2012/MARIA of 7 September 2012), which included the amendment to the conditions of the license issued for the National Centre for Nuclear Research in Świerk concerning the possibility to test Russian fuel, type MR-6/485 on the basis of Annex No 2012/2 to the Operational Safety Report of MARIA Reactor.
2. Regarding the issue of opinion on a draft annex No 10/2013/MARIA to the license of the President of National Atomic Energy Agency No 1/2009/MARIA, which included the amendment to the conditions of the license issued for the National Centre for Nuclear Research in Świerk concerning the admission for operation French fuel, type MC-5/480 with water consumption limited to 25 m^3/h cooling fuel channel and limited to 1.5 MW power from one fuel channel.
3. Regarding the issue of opinion on a draft annex 11/2013/MARIA to the license of the President of National Atomic Energy Agency No 1/2009/MARIA, , which included the amendment to the conditions of the license issued for the National Centre for Nuclear Research in Świerk concerning amendments to the Operational Safety Report of MARIA Reactor which consisted in:
   a) the removal of a set of main pumps and the installation of post-shut down pumps of the fuel channels cooling circulation,
   b) the installation of a fuel socket in the position: h-8 of the reactor core.

I. 4. ASSESSMENT OF THE FUNCTIONING OF NATIONAL ATOMIC ENERGY AGENCY

In 2013 the nuclear regulatory body issued 1444 administrative decisions regarding radioactive sources. As regards nuclear facilities, the nuclear regulatory body issued 6 administrative decisions and there were no applications to reconsider the case.

No appellation was submitted to the Supreme Administrative Court against a decision issued by PAA.
In 2013, PAA was controlled by the Supreme Chamber of Control in terms of:

- development and implementation of Polish Nuclear Power Program (in the period from 3 October to 11 April),
- execution of the state budget in 2012 in section 68 – PAA (in the period from 18 February to 29 March).

The Supreme Chamber of Control positively assessed the activities of the PAA President taken in connection with the development and implementation of Polish Nuclear Power Program and did not find any non-compliances in terms of legal and organizational framework for the construction and functioning of nuclear power in Poland.

The Supreme Chamber of Control did not find any irregularities in terms of on-job-trainings and professional instructions organized by the PAA aimed to implement Polish Nuclear Power Program. The above conclusions are included in the report on the control findings entitled: *Development and Implementation of Polish Nuclear Power Program*.

In accordance with the Public Finances Act, PAA introduced a management control system which allows to carry out, among other things, risk analysis and management system assessment.

II. INFRASTRUCTURE OF NUCLEAR REGULATORY ACTIVITIES IN POLAND

II. 1. DEFINITION, STRUCTURE AND FUNCTIONS OF NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION SYSTEM

The nuclear safety and radiological protection system includes all legal, organizational and technological activities which ensure the proper state of nuclear and radiological safety. The operation of nuclear facilities, both in Poland and abroad, and other activities involving ionizing radiation sources may create hazards to nuclear safety.

In Poland, all issues connected with radiological protection or the environmental radiation monitoring are, under the binding provisions of law, considered jointly with the issue of nuclear safety, physical protection and nuclear material safeguards. Thanks to this solution, there is one common approach to all aspects of radiological protection, nuclear safety, nuclear material safeguards and radioactive sources and thus all the nuclear regulatory activities are consolidated into one regulatory system.

The nuclear regulatory authorities in Poland consist of: the PAA President, Chief Nuclear Regulatory Inspector and Nuclear Regulatory Inspectors who are PAA employees.

The nuclear safety and radiological protection system operates in accordance with the Atomic Law Act of 29 November 2000 and its secondary legislation, as well as the UE directives and regulations and also treaties and international conventions to which Poland is a party.

Essential elements of the nuclear safety and radiological protection system include:

- exercising regulatory supervision over the activities involving nuclear materials and ionizing radiation sources by means of: the issuance of decisions on licenses concerning the performance of these activities or their registration, control over the manner in which activities are performed, control over doses received by workers, oversight of trainings of radiation protection officers (experts in nuclear safety and radiological protection matters at the entities which conduct activities on the basis of licenses granted) and workers exposed to ionizing radiation, control over the trade in radioactive materials, the maintenance of the register of radioactive sources and users of radioactive sources and the central register of individual doses, and in case of activities involving nuclear materials also the maintenance of detailed records and accounting with regard to these materials, the approval of physical protection systems for nuclear materials and control of technologies applied;
- recognizing and assessing the national radiation situation by means of the coordination (including standardization) of works performed by local stations and units measuring the level of radiation dose rate, amount of radionuclides in chosen elements of the natural environment and in drinking water, foodstuffs and feedingstuffs;
- maintaining suitable services prepared to recognize and assess the national radiation situation and to respond in case of radiation emergencies (in cooperation with other competent authorities and services operating within the framework of the national emergency response system).
- performing tasks aimed at the fulfilment of obligations of the Republic of Poland resulting from treaties, conventions and international agreements with regard to nuclear safety and radiological protection, and bilateral agreements on early notification in case of nuclear accidents and cooperation with Poland's neighbouring counties in nuclear safety and radiological protection and also for the purpose of assessment of the state of nuclear facilities, radioactive sources and waste management and nuclear safety and radiological protection systems which are located outside the territory of Poland.

Pursuant to the Atomic Law Act, the aforementioned tasks are performed by the PAA President.

Exceptionally, the PAA President's supervision over activities involving ionizing radiation sources is not required in case of the applications of X-ray devices for the purposes of medical diagnostics, interventional radiology, surface radiotherapy and radiotherapy of non-cancerous diseases. The supervision over the said activities is exercised by the national provincial sanitary inspectorates (or services in charge which report to the Minister of National Defence and Minister of Interior and Administration).

The PAA President's supervision over any activity connected with exposure to ionizing radiation involves:

1. Determining conditions which are required to ensure nuclear safety and radiological protection.
2. Licensing with regard to:
   - manufacturing, processing, storage, disposal, transport or use of nuclear materials, radioactive sources, radioactive waste and spent nuclear fuel, as well as the trade in these materials, and also isotopic enrichment,
   - construction, commissioning, operation and decommissioning of nuclear facilities,
   - construction, operation, closure and decommissioning of radioactive waste repositories,
   - production, installation, use and maintenance of the equipment containing radioactive sources and trade in such devices,
   - commissioning and use of the equipment generating ionizing radiation,
   - commissioning of laboratories and workrooms using ionizing radiation sources, including X-ray laboratories (other than supervised by sanitary services),
   - intentional addition of radioactive substances in the processes of manufacturing consumer and medical products, medical products for in vitro diagnostics purposes, and in the process of providing equipment of medical products and equipment of medical products for in vitro purposes, active medical products for implantation within the meaning of provisions of the Act on Medical Products of 20 May 2010 (Journal of Laws, No 107, Item 679) and trade in such products, and also the import into the Republic of Poland's territory, and export from this territory, of consumer and medical products to which radioactive substances have been added,
   - intentional administration of radioactive substances to humans and animals, for the purposes of medical or veterinary diagnostics, therapy or research.
3. Controlling the aforesaid activities as to the fulfilment of criteria specified by relevant provisions of law and terms of licenses granted, and additionally vital factors taken into consideration here include: exposure of workers, population and the environmental hazards and radioactive waste management.

The PAA President's supervision, in the scope of activities connected with nuclear material, also involves approving and inspecting physical protection systems and performing activities as set forth in the obligations of the Republic of Poland relating to control and safeguards (and registry) of this material.

The Atomic Law Act, its secondary legislation and international provisions of law are further discussed in this section of the report.

II. 2. BASIC PROVISIONS OF LAW ON NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION

2.1. Atomic Law Act

The Act of Parliament on Atomic Law of 29 November 2000 which came into force on 1 January 2002 introduced a consolidated system ensuring nuclear safety and radiological protection of workers and entire population in Poland. The most important provisions of the aforementioned Act concern the regulation and control over the activities connected with exposure to ionizing radiation (i.e. licenses on activities specified in the section entitled 'Definition, structure and functions of nuclear safety and radiological protection system'), the obligations of heads of organizational entities which conduct activities involving radiation and rights of the President of National Atomic Energy Agency (PAA) to exercise regulatory control and supervision over these activities. The Act also provides for other tasks of the PAA President related, inter alia, to the assessment of national radiation situation and emergency preparedness and response in case of radiation emergencies.

Principles and procedures as set forth in the aforesaid Act, regard the following issues:

1. justification of instituting activities which involve exposure to ionizing radiation, their optimization and establishing dose limits for workers and the entire population,
2. procedure for obtaining required licenses on the performance of such activities as well as the mode and method of controlling the performance of such activities,
3. accounting and control of ionizing radiation sources,
4. accounting and control of nuclear materials,
5. physical protection of nuclear materials and nuclear facilities,
6. management of high-activity sealed radioactive sources,
7. classification of radioactive waste and methods of radioactive waste and spent nuclear fuel management,
8. classification of workers and their workstations on the basis of a degree of exposure involved in the work performed and designation of protection measures, suitable to counteract this exposure,

9. training and issuing authorizations to be employed in particular positions which are considered important for ensuring nuclear safety and radiological protection,
10. assessment of national radiation situation,
11. procedures applied in case of radiation emergencies.

In accordance with the Act, the head of entity conducting activities which involve ionizing radiation bears liability for the application of radiation. In order to support the performance of obligations by the heads of entities, a special rule was introduced which stipulates that the internal supervision over the compliance with safety requirements is exercised, in case of a given entity, by a radiation protection officer i.e. a person provided with special authorizations granted by the PAA President under the provisions of the Atomic Law Act.

The rule concerns all those activities whose performance requires a license, however the Act also envisages the possibility to perform activities on the basis of a suitable notification, and also specifies circumstances where neither license nor notification is required due to a low level of activity of radioactive substances.

Some types of positions (particularly those performed at nuclear facilities and also at organizational entities conducting activities which involve ionizing radiation) have been considered to be exceptionally significant for ensuring nuclear safety and radiological protection. These positions may be staffed only by those candidates who have completed courses offered by special training centres and have successfully passed suitable examinations before the examination board appointed by the PAA President. Similar rules will apply to individuals who will perform in the future particular activities important for ensuring nuclear safety and radiological protection in nuclear power plants. Other employees from various entities are also trained – it is an internal course, provided by the head of the entity where they work, upon previous approval of the course programme by the PAA President.

In order to ensure radiological safety of staff exposed to ionizing radiation, dose limits were established which, except for cases determined in the Act, may not be exceeded. Workers are included in a compulsory dosimetric measurement program which is intended to control doses received by workers.

The head of entity is obliged to monitor the staff's dose measurement results. At the same time, dose measurement results of all workers classified in A category, who are potentially most exposed to ionizing radiation, are submitted to the central registry of doses maintained by the PAA President.

The Act in a special way addresses the issue of nuclear material and high-activity sealed radioactive sources, transport and also transboundary movement of radioactive waste and spent nuclear fuel by introducing mechanisms which allow for safe shipment of these materials and a guaranteed delivery to a target recipient.

Radioactive waste is also treated in a special way in the Act. In order to ensure suitable conditions of waste management for disposal, a state-owned enterprise was established – 'The Radioactive Waste Management Plant', which is subsidized by the state to conduct its statutory activities. This enterprise has been secured against liquidation or bankruptcy which allows for its uninterrupted operations.

High-activity sealed sources are under supervision from the moment of manufacture until the time of their disposal: the management procedure at each stage of their use was determined and the form of securing costs of delivery and management, after the end of activities involving their application, was agreed.

Assuming that even with the most effective safety system, there may always occur an event resulting in the increase of the radiation level, the Act obliges the PAA President to perform permanent assessment of national radiation situation and take follow-up measures both in Poland and on the international scale. Additionally, the Act defines a radiation emergency, systematizes types of emergencies and determines the manners in which suitable authorities and services should respond to such emergencies.

In order to ensure effective enforcement of nuclear safety and radiological protection provisions, the Act also includes provisions which allow suitable authorities to respond immediately to any possible infringements of law. The Act provides for the possibility of administrative fines imposed by the Chief Nuclear Regulatory Inspector by means of an administrative decision.

Qualified infringement of the provisions of law regarding issues mentioned above is governed by the provisions of the Penal Code.

The application of ionizing radiation is based on the international consensus determining rules and methods of procedures. The solutions adopted by the Atomic Law Act fully correspond to the international regulations since they result from international agreements, which are binding for Poland, and the European Union provisions, especially the EU directives.

The present form of the Atomic Law Act was shaped in 2011. The amendment to this Act was performed then in connection with the requirement for the implementation into the Polish laws of the provisions of the Council Directive 2009/71/EURATOM of 25 June 2009 establishing common nuclear safety framework[1], and the ratification by Poland of the Protocol amending Vienna Convention of 1963 on civil liability for nuclear damages, drawn up in Vienna on 12 September 1997[2] and the commencement of works on the Polish Nuclear Power Program.

[1] OJ L 172 of 02.07.2009 p. 18 and OJ L 260 of 03.10.2009, p. 40.
[2] OJ of 2011, No 4, Item 9.

The most important changes under the Atomic Law Act of 13 May 2011 on the amendment to the Atomic Law Act and several other acts (Journal of Laws No 132, Item 766) include the provisions which in detail determine requirements for nuclear safety and radiological protection concerning siting, design, construction, commissioning, operation and decommissioning of nuclear facilities, and also regarding siting and construction of radioactive waste and spent nuclear fuel repositories. The amended Act includes the principle that a nuclear facility is located in the territory which ensures nuclear safety, radiological protection, physical protection during commissioning, operation and decommissioning of this facility and also effective emergency response procedures in case of a radiation emergency. Investor of a nuclear facility as a future license holder should conduct the assessment of land intended for siting of a nuclear facility and prepare its results including the results of tests and measurements constituting the basis for its preparation in the form of a siting report. The siting report is subject to the PAA President's assessment during the licensing procedure concerning construction of a nuclear facility. As a result of the amended Act, the investor of a nuclear facility was provided with the possibility to submit an application to the PAA President to issue a preliminary opinion concerning the planned site of a nuclear facility.

The Atomic Law Act does not provide for a separate license required for a design of nuclear facilities. However, basic conditions were determined in relation to a design of a nuclear facility which must be met from the viewpoint of nuclear safety and radiological protection and safe functioning of technical devices installed and operated at a nuclear facility. Such design must ensure nuclear safety, radiological protection and physical protection during construction, commissioning, operation, including repairs and modernization, and also decommissioning of this facility and the possibility to conduct effective emergency response procedures in case of a radiation emergency. It should also take into account a safety level sequence preventing deviations from normal operating conditions, operational occurrences, accidents envisaged in design assumptions and severe accidents exceeding these assumptions, and if it is not possible to prevent the deviations, occurrences or accidents – controlling them and minimizing radiation consequences of accidents.

The provisions of amended Atomic Law Act oblige the investor to conduct, prior to submission to the PAA President of an application to issue a license to construct a nuclear facility, safety analyses in terms of nuclear safety taking into account technical and environmental factor. The investor must submit the conducted safety analyses for a verification in which entities participating in the preparation of a nuclear facility design may not be involved. Results of safety analyses are the basis for preparing preliminary safety report submitted to the PAA President with an application to issue a license for the construction of a nuclear facility.

Systems, structures and components of a nuclear facility important from the viewpoint of nuclear safety and radiological protection, including steering and control software, must be, in accordance with new provisions of the Atomic Law Act, identified and classified to safety classes depending on the degree in which these systems, structures and components impact nuclear safety and radiological protection of a nuclear facility. Documentation containing a classification of safety systems and systems, structures and components of a nuclear facility constitutes one of the elements of integrated management system which should be possessed by an organizational entity conducting activities involving a nuclear facility.

This documentation should be submitted for approval to the PAA President with an application to issue license for the construction of a nuclear facility. In the process of construction of a nuclear facility, nuclear regulatory bodies as well as other authorities within the scope of their competences, will be able to control contractors and suppliers of systems and structures of a nuclear facility and also contractors of works performed at the construction and provision of equipment of nuclear facility in terms of systems, structures and works important for nuclear safety and radiological protection and safe functioning of technical devices.
Amended Atomic Law
Act provides the PAA President with the following supervision measures in relation to an organizational entity conducting activities consisting in the construction, operation or decommissioning of a nuclear facility for which controlled contractors and suppliers perform their services:

1. interdiction to use a particular system, structure or component of a nuclear facility – if during control it was established that it may negatively influence nuclear safety and radiological protection of a nuclear facility;
2. order to suspend particular works in a nuclear facility – if it is established that they are conducted in a way which can negatively influence nuclear safety and radiological protection of a nuclear facility.

The Atomic Law Act emphasizes the principle that a nuclear facility is commissioned and operated in a way ensuring nuclear safety and radiological protection of workers and population in accordance with the integrated management system which has been implemented in the organization entity. Commissioning of a nuclear facility should be conducted in accordance with the program approved by the PAA President and documented in commissioning documentation of a this facility. The PAA President was vested with special regulatory powers regarding commissioning stage of a nuclear facility, such as: possibility to issue decisions to suspend commissioning of a nuclear facility and approval of a report on commissioning of a nuclear facility.

The amended Act also includes obligation to maintain operating documentation of a nuclear facility and to submit to the PAA President current information about operating parameters of a nuclear facility for safety, and to the President of Technical Inspection Office – information about safety of functioning of devices subject to provisions on technical inspection, installed and operated in a nuclear power plant. The PAA President was also vested with the right to issue an order to reduce the power output or to stop the operation of a nuclear facility if further operation of this facility poses any threat to nuclear safety or radiological protection, in his/her assessment or based on information forwarded by the President of the Office of Technical Inspection.

The head of organizational entity conducting activities involving exposure and consisting in the operation of nuclear facilities must, under the Atomic Law Act, regularly assess the nuclear safety of the facilities (referred to as ‘periodical safety assessments’) in accordance with periodical safety assessment plans approved each time by the PAA President.
The further operation of a nuclear facility is conditional on the PAA President’s approval of a report on periodical assessment performed.
The head of organizational entity is obliged to develop a program of decommissioning of a nuclear facility and submit it for approval to the PAA President along with the application to issue a license for the construction, commissioning and operation of a nuclear facility. During facility’s operation, this program will have to be updated and approved at least once in every 5 years and immediately after the completion of operation of a nuclear facility due to extraordinary events. Pursuant to amended Atomic Law Act, nuclear facility decommissioning is considered completed on the day when the nuclear facility decommissioning report is approved by the Agency's President.

The Act also introduces the system for financing final management of spent nuclear fuel and radioactive waste and decommissioning of a nuclear facility. In order to cover the costs of the spent nuclear fuel and radioactive waste disposal and the costs of nuclear power plant decommissioning, the organizational entity which was licensed to operate a nuclear power plant must make quarterly payments to a distinguished special fund, referred to as a ‘decommissioning fund’.

The funds allocated this way will only be distributed for the coverage of costs of final management of radioactive waste and spent nuclear fuel from a nuclear facility and for the coverage of costs of decommissioning of this nuclear facility. The payment of decommissioning funds will take place only following a favourable opinion of the PAA President in response to an application submitted by an organizational entity which was licensed to operate or decommission a nuclear facility.

The amended Atomic Law Act also includes requirements for the selection of a site for the radioactive waste repository from the viewpoint of safety. Prior to such selection, the investor has to assess the fulfilment of siting requirements specified in the Regulation of the Council of Ministers of 3 December 2002 on radioactive waste and spent nuclear fuel. This assessment must be included in the siting report.

Consequently, this report is subject to the PAA President's assessment in the course of procedure to issue a license for the construction of a radioactive waste repository. Similarly to a nuclear facility, the investor of a radioactive waste repository has the possibility to submit an application to the PAA President to issue a preliminary opinion regarding a planned site of the radioactive waste repository. In this case, the investor should enclose a siting report to the application.

The amended Atomic Law Act also includes new provisions not directly connected with the PAA President's tasks which concern the field of nuclear power sector. These provisions came into force on 1 January 2012. In particular they refer to:

- obligations of different entities on providing public information with regard to nuclear power facilities;
- activities of the minister competent for economy issues and the Council of Ministers regarding the development of nuclear power, in particular the adoption of the Polish Nuclear Power Program.

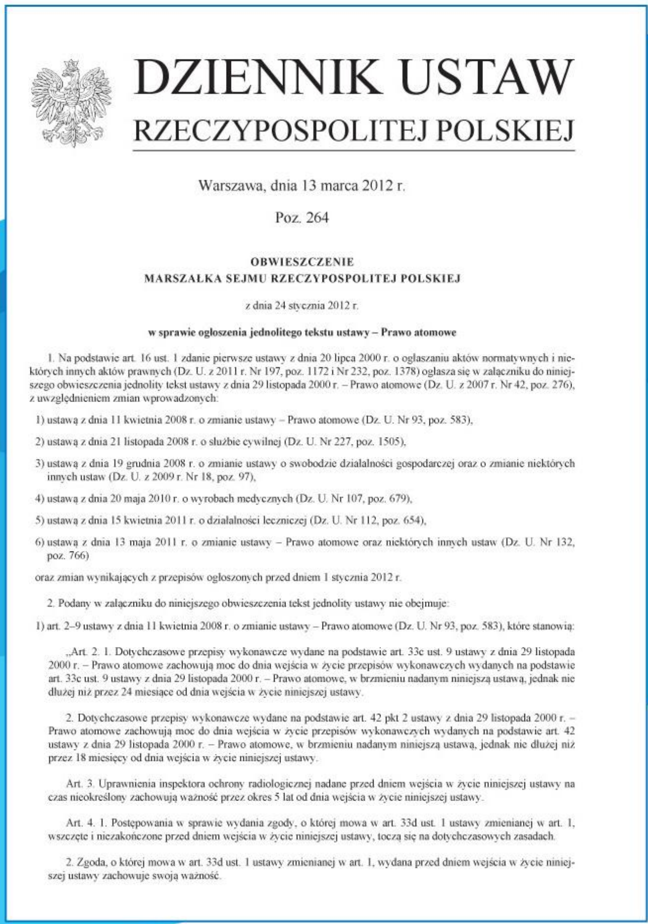
In 2013 the Ministry of Economy conducted works on the draft act regarding the amendment to the Atomic Law Act and several other acts. The original draft of this act was developed jointly by the PAA President and Minister of Economy. The PAA President also actively participated in works regarding this draft, submitting his comments and observations during inter-ministerial negotiations and within the framework of working consultations with the Ministry of Economy. This amendment is aimed at implementing into the national laws the provisions of Council Directive 2011/70/EURATOM of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (Official Journal of EU L 199 of 02.08.2011, p. 48). The Directive imposes on the member states the obligation to introduce national legislative, regulatory and organizational framework ensuring the high level of safety for the management of spent nuclear fuel and radioactive waste. The goal of the draft act is to complete solutions which are already in place in Poland. It also envisages the introduction of an obligation regarding the development of a national program for spent nuclear fuel and radioactive waste management in Poland.

2.2. Other Acts

The provisions which are indirectly connected with the issues of nuclear safety and radiological protection are also included in other acts, in particular in:

1) the Act of 19 August 2011 on shipment of hazardous goods (Journal of Laws No 227, Item 1367 and No 244, Item 1454[3]
2) the Act of 18 August 2011 on marine safety (Journal of Laws No 228, Item 1368[4]
3) the Act of 21 December 2000 on technical supervision (Journal of Laws No 122, Item 1321, with later amendments).

[3] It came in force on 1 January 2012 superseding the Act of 28 October 2002 on road transportation of hazardous goods (Journal of Laws No 199, Item 1671, with later amendments)
and the Act of 31 March 2004 on rail transportation of hazardous goods (Journal of Laws No 97, Item 962 with later amendments).
[4] It came into force on 25 January 2012 superseding the Act of 9 November 2000 on marine safety (Journal of Laws of 2006, No 99, Item 693 with later amendments).



DZIENNIK USTAW
RZECZYPOSPOLITEJ POLSKIEJ

Warszawa, dnia 13 marca 2012 r.

Poz. 264

OBWIESZCZENIE
MARSZAŁKA SEJMU RZECZYPOSPOLITEJ POLSKIEJ

z dnia 24 stycznia 2012 r.

w sprawie ogłoszenia jednolitego tekstu ustawy – Prawo atomowe

1. Na podstawie art. 16 ust. 1 zdanie pierwsze ustawy z dnia 20 lipca 2000 r. o ogłaszaniu aktów normatywnych i niektórych innych aktów prawnych (Dz. U. z 2011 r. Nr 197, poz. 1172 i Nr 232, poz. 1378) ogłasza się w załączniku do niniejszego obwieszczenia jednolity tekst ustawy z dnia 29 listopada 2000 r. – Prawo atomowe (Dz. U. z 2007 r. Nr 42, poz. 276), z uwzględnieniem zmian wprowadzonych:

1) ustawą z dnia 11 kwietnia 2008 r. o zmianie ustawy – Prawo atomowe (Dz. U. Nr 93, poz. 583),
2) ustawą z dnia 21 listopada 2008 r. o służbie cywilnej (Dz. U. Nr 227, poz. 1505),
3) ustawą z dnia 19 grudnia 2008 r. o zmianie ustawy o swobodzie działalności gospodarczej oraz o zmianie niektórych innych ustaw (Dz. U. z 2009 r. Nr 18, poz. 97),
4) ustawą z dnia 20 maja 2010 r. o wyrobach medycznych (Dz. U. Nr 107, poz. 679),
5) ustawą z dnia 15 kwietnia 2011 r. o działalności leczniczej (Dz. U. Nr 112, poz. 654),
6) ustawą z dnia 13 maja 2011 r. o zmianie ustawy – Prawo atomowe oraz niektórych innych ustaw (Dz. U. Nr 132, poz. 766)

oraz zmian wynikających z przepisów ogłoszonych przed dniem 1 stycznia 2012 r.

2. Podany w załączniku do niniejszego obwieszczenia tekst jednolity ustawy nie obejmuje:

1) art. 2–9 ustawy z dnia 11 kwietnia 2008 r. o zmianie ustawy – Prawo atomowe (Dz. U. Nr 93, poz. 583), które stanowią:

„Art. 2. 1. Dotychczasowe przepisy wykonawcze wydane na podstawie art. 33c ust. 9 ustawy z dnia 29 listopada 2000 r. – Prawo atomowe zachowują moc do dnia wejścia w życie przepisów wykonawczych wydanych na podstawie art. 33c ust. 9 ustawy z dnia 29 listopada 2000 r. – Prawo atomowe, w brzmieniu nadanym niniejszą ustawą, jednak nie dłużej niż przez 24 miesiące od dnia wejścia w życie niniejszej ustawy.

2. Dotychczasowe przepisy wykonawcze wydane na podstawie art. 42 pkt 2 ustawy z dnia 29 listopada 2000 r. – Prawo atomowe zachowują moc do dnia wejścia w życie przepisów wykonawczych wydanych na podstawie art. 42 ustawy z dnia 29 listopada 2000 r. – Prawo atomowe, w brzmieniu nadanym niniejszą ustawą, jednak nie dłużej niż przez 18 miesięcy od dnia wejścia w życie niniejszej ustawy.

Art. 3. Uprawnienia inspektora ochrony radiologicznej nadane przed dniem wejścia w życie niniejszej ustawy na czas nieokreślony zachowują ważność przez okres 5 lat od dnia wejścia w życie niniejszej ustawy.

Art. 4. 1. Postępowania w sprawie wydania zgody, o której mowa w art. 33d ust. 1 ustawy zmienianej w art. 1, wszczęte i niezakończone przed dniem wejścia w życie niniejszej ustawy, toczą się na dotychczasowych zasadach.

2. Zgoda, o której mowa w art. 33d ust. 1 ustawy zmienianej w art. 1, wydana przed dniem wejścia w życie niniejszej ustawy zachowuje swoją ważność.

2.3. Secondary legislation of the Atomic Law Act

Secondary legislation of the Atomic Law Act includes detailed regulations concerning nuclear safety and radiological protection. As for the PAA President's rights and responsibilities, these provisions specify in particular:

1) documents which must be submitted and attached to the application for license on specific activities involving exposure to ionizing radiation (or attached to a notification concerning such activities),
2) cases in which activities involving exposure may be conducted without authorization or notification,
3) requirements concerning controlled and supervised areas, as well as dosimetric equipment,
4) values of dose limits for workers and the entire population,
5) positions which are important from the viewpoint of nuclear safety and radiological protection and requirements which must be fulfilled by a candidate applying for authorizations to occupy a given position, and also requirements for the authorizations of radiation protection officer,
6) detailed conditions concerning work involving ionizing radiation sources,
7) methods of physical protection of nuclear material.

In connection with the amended Atomic Law Act, in 2011 and 2012 the National Atomic Energy Agency (PAA) prepared drafts of 13 executive regulations. The provisions of two regulations of the Minister of Environment, adopted and published in 2011, entered into force in January 2012 and they are with regard to:

- method and working procedure of the Council for Nuclear Safety and Radiological Protection,
- official identification card of a Nuclear Regulatory Inspector.

Next 9 regulations of the Council of Ministers, developed by the National Atomic Energy Agency (PAA), were published in 2012. These regulations concern:

- standard form of a quarterly report on the amount of fee paid for a decommissioning fund,
- method for performing a periodical nuclear safety assessment of a nuclear facility,
- Nuclear Regulatory Inspectors,

- positions important for nuclear safety and radiological protection and radiation protection officers,
- activities important for ensuring nuclear safety and radiological protection in a nuclear power plant,
- detailed scope of assessment with regard to land intended for the site of a nuclear facility, cases excluding land to be considered eligible for the site of a nuclear facility and requirements concerning siting report for a nuclear facility,
- scope and method for the performance of safety analyses prior to the submission of an application requesting a license for the construction of a nuclear facility and the scope of a preliminary safety report for a nuclear facility,
- nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design
- amount of fee for a decommissioning fund. Last 2 regulations of the Council of Ministers, which were developed by the PAA in 2012 but were published and entered into force in 2013, concern:
- requirements for commissioning and operation of nuclear facilities,
- requirements for nuclear safety and radiological protection for the stage of decommissioning of nuclear facilities and the content of a report on decommissioning of a nuclear facility.

Moreover in 2012, 3 subsequent regulations were issued to the amended Atomic Law Act which were prepared in the Ministry of Economy and in the Ministry of Health and not in the PAA. They concern:

- special purpose subsidy granted for ensuring nuclear safety and radiological protection of Poland while using ionizing radiation,
- detailed rules concerning the establishment and operation of Local Information Committees and cooperation in terms of nuclear power facilities,
- granting authorizations of radiation protection officer in laboratories using X-ray devices for medical purposes.

A detailed list of all secondary legislation of the Atomic Law Act is included in the Appendix No 1 to this report. Additionally, the PAA was conducting legislative works concerning other two draft regulations (see chapter III.1.).

2.4. International instruments

Poland ratified a number of international agreements relating to nuclear safety and radiological protection which, under the Constitution of the Republic of Poland, are the source of binding provisions of law in Poland. These acts include the areas of international cooperation and exchange of information in case of nuclear accident or radiological emergency, nuclear safety of nuclear facilities, safety of spent nuclear fuel management and radioactive waste management, physical protection of nuclear material.

As regards civil liability for damages caused by nuclear accident, Poland is a party to the Vienna Convention on Civil Liability for Nuclear Damage, done at Vienna on 21 May 1963 (Journal of Laws of 1990, No. 63, Item 370) and the Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage done at Vienna on 12 September 1997 (Journal of Laws of 2011, No 4, Item 9). Poland is also a party to the Treaty on the Non-Proliferation of Nuclear Weapons, done at Moscow, Washington, London on 1 July 1968 (Journal of Laws of 1970, No. 8, Item 60) (INFCIRC/140), and all the resulting agreements and protocols.

In addition, Poland is a party to the Treaty Establishing the European Atomic Energy Community (EURATOM). Based on this treaty, a number of directives have been adopted and implemented into the Polish legal system. They include, inter alia, the issues concerning nuclear safety of nuclear facilities, basic safety standards for the protection of the health of workers and the general public, information to the general public about health protection measures to be applied and steps to be taken in the event of radiological emergency, management of high-activity sealed ionizing radiation sources, including uncontrolled sources (e.g. abandoned, stolen, illegally possessed sources). Shipment of radioactive waste and spent nuclear fuel through internal and external borders of the European Union constitutes an important part in the European regulations.

A list of major acts of the international law and the European Union's law is included in Appendix No 2 to this report.

PAA

NATIONAL
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III. NATIONAL ATOMIC ENERGY AGENCY AND ITS ROLE IN POLISH NUCLEAR POWER PROGRAM

III. 1. NATIONAL ATOMIC ENERGY AGENCY AND ITS ROLE IN POLISH NUCLEAR POWER PROGRAM

III. 2. NATIONAL ATOMIC ENERGY AGENCY CHANGES ITS IMAGE AND OPENS NEW COMMUNICATION CHANNELS

III. 1. NATIONAL ATOMIC ENERGY AGENCY AND ITS ROLE IN POLISH NUCLEAR POWER PROGRAM

Polish Nuclear Power Program (PNPP) was was adopted by the Council of Ministers on 28 January 2014. It is the first comprehensive document presenting the structure for the organization of activities which must be taken in order to implement nuclear power in Poland. The National Atomic Energy Agency is one of the main stakeholders of Polish Nuclear Power Program and performs the role of a regulator – the Agency supervises safety of nuclear facilities and activities performed in these installations, conducts inspections and assessment of safety, issues licenses and imposes possible sanctions. The Ministry of Economy is also involved in the implementation of the Program as its promoter (dealing with the coordination and promotion of the project and the use of nuclear power for the social and economic purposes of the country) and PGE as an investor (providing finances for the construction of a nuclear facility and organizing its construction and operations.) PAA started preparations to the implementation of PNPP in 2009 when the the Government's Commissioner for Polish Nuclear Power was appointed. In the subsequent years PAA experts actively participated in works regarding the document, and the Agency underwent numerous transformations and organizational changes in order to adapt PAA to the function of a modern nuclear regulator.

PAA tasks as a nuclear regulatory body in relation to nuclear facilities, including nuclear power plants include first of all:

1. formulating requirements on nuclear safety and radiological protection,
2. issuing technical recommendations specifying detailed methods of ensuring safety, performing analyses and assessments of technical information provided with suitable safety analyses by the investor or organization operating a nuclear facility in order to verify if this nuclear facility fulfils adequate objectives, rules and criteria of safety for the purpose of licensing processes and other decisions of a nuclear regulator,
3. conducting licensing process with regard to construction, commissioning, operation and decommissioning of nuclear facilities,
4. conducting inspections of activities performed by the investor or organization operating nuclear facility as to the assurance of safety including compliance with the provisions on nuclear safety and radiological protection and compliance with conditions set out in particular licenses and decisions issued by a nuclear regulator;
5. imposing sanctions requiring the compliance with aforementioned requirements.

At present PAA is fully prepared to perform the function of a nuclear regulator proportionally to the stage at which the process of PNPP implementation is at the moment. In the nearest future the Agency will be performing an assessment of the site selected for the first Polish nuclear power plant, next, selected technology and issue of license for the construction.

Legislative changes

The implementation of nuclear program required, above all, major changes in Polish laws. PAA participated in works regarding amendment to the Atomic Law Act and prepared drafts of 9 executive regulations to the amended Act. They include completely new solutions which had not been used in Polish legal system so far. The regulations in detail specify the issues of safety of nuclear facilities, including nuclear power plants.

7 regulations entered into force in 2012 and 2 at the beginning of 2013. These regulations include a regulation on requirements for nuclear safety and radiological protection for the stage of decommissioning of nuclear facilities and the contents of a report on decommissioning of a nuclear facility and the regulation on the requirements for commissioning and operations of nuclear facilities.

Personnel changes

Year 2013 was the period when most adaptation activities conducted in order to transform PAA in a modern nuclear regulatory body were completed. The need for these activities was the result of analyses conducted in 2011. One of the most important aspect was the increase of the number of jobs in PAA by 17 nuclear regulatory inspectors, 13 employees performing safety analyses and 9 specialists in administrative law. The increase in employment was the result of the growing workload in connection with regulatory process – issue of licenses for the activities of nuclear facilities, oversight of works during construction and then operation of a nuclear power plant.

Poland has not been a user of nuclear power for commercial purposes (production of electrical power), therefore there is a shortage of specialized staff in this field. Employees working at PAA are the future experts who are being intensively trained in Poland and abroad. Thanks to the cycle of trainings, they will have competence necessary to supervise safety of the future nuclear power plant.

Structural changes

In the past, PAA was also responsible for tasks which were not directly related with supervising nuclear safety and radiological protection of Poland. At the beginning of 2013 these responsibilities were handed over to other offices. The coordination of cooperation with the European Nuclear Research Centre (CERN) in Geneva and the Joint Institute for Nuclear Research in Dubna (JINR) was passed on to the Ministry of Science and Higher Education, and the coordination of cooperation with the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) in Vienna was transferred to the Ministry of Foreign Affairs.

Due to the fact that PAA resigned from the above functions, the Agency can now concentrate exclusively on the oversight of nuclear safety and radiological protection engaging all its resources to meet this objective.

Positive assessment of the National Atomic Agency's activities in connection with Polish Nuclear Power Program

Changes in PAA conducted in connection with PNPP were very positively assessed by both national and foreign experts. The Supreme Chamber of Control favorably assessed the activities of the PAA President taken in connection with the preparation and implementation of PNPP and did not find any non-compliances in terms of legal and organizational framework for the construction and functioning of nuclear power in Poland. Neither did it find any inconsistencies in terms of on-job-trainings and professional instructions organized by PAA aimed at the implementation of PNPP. These conclusions were included in the report on the audit entitled: *Development and Implementation of Polish Nuclear Power Program*. The audit in question covered the period from 1 January 2009 to 11 April 2013 and the findings were published in October 2013.

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

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

III. 2. NATIONAL ATOMIC ENERGY AGENCY CHANGES ITS IMAGE AND OPENS NEW COMMUNICATION CHANNELS

Image changes

In order to underline changes taking place in PAA, a number of image changes were introduced and new communication channels with the general public and outside entities were opened. In 2013 the National Atomic Energy Agency refreshed its logo. A new logo has got a simplified font type and dynamic electron orbital rotating around the letters. It appears in three variations – horizontal, vertical and combined and also in color and black and white version.

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

In 2013, PAA also modernized its website. A new site is much easier to handle, has got extended substantive contents as well as richer and more attractive graphic design. The site contains regular news coverage regarding PAA activities and the most important information on nuclear safety and radiological protection.
In 2013 a new project was launched aimed at the introduction of a new Public Information Bulletin complying with the visual identification system.

Communication with the general public

One of the tasks of PAA President, specified in Article 110 Section 6 of the Atomic Law Act is the conduct of activities regarding public information, education and popularization and scientific, technical and legal information in terms of nuclear safety and radiological protection. This task entails in particular providing the general public with information about ionizing radiation and its impact on human health and also on the environment and about possible measures to be used in case of radiation events (accidents). This tasks is performed by staff members of the President's Office and Director's General Office.

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

In 2013, the Public Communication Division acting in the President's Office intensified its relations with media and extended PAA information activities. PAA President, gave several interviews to national and local news and radio stations. The President's comments were usually connected with PAA preparations to the implementation of PNPP. PAA press services informed journalist, on the on-going basis, about radiation emergencies, including among other, a few incidents when containers with radioactive isotopes went missing from industrial plants. PAA experts also appeared in media speaking about nuclear safety and commenting, for example, on the situation in the damaged nuclear power plant Fukushima Daiichi.

The most important news is sent to journalists by e-mail and also by means of PAA spokesperson's account on Twitter. This service, which hosts many Polish journalists, commentators, activists, politicians and other public figures, enables immediate exchange of information and images. On her profile, the PAA spokesperson presents the latest news regarding the Agency's activities (media presentations or press conferences of PAA leadership team and experts), radiation emergencies and other information which may be interesting from the viewpoint of media and the general public.

NATIONAL
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IV. OVERSIGHT OF THE USE OF IONIZING RADIATION SOURCES

IV. 1. USERS OF IONIZING RADIATION SOURCES IN POLAND

IV. 2. LICENSES AND NOTIFICATIONS

IV. 3. REGULATORY INSPECTIONS

IV. 4. REGISTRY OF SEALED RADIOACTIVE SOURCES

IV. 1. USERS OF IONIZING RADIATION SOURCES IN POLAND

The main tasks of the PAA President resulting from the regulatory control over activities connected with exposure to ionizing radiation are:

- issuing licenses and taking other decisions concerning nuclear safety and radiological protection followinganalysis and assessment of documentation submitted by users of ionizing radiation sources,
- preparing and performing inspections of organizational entities which conduct activities connected with exposure,
- maintaining registry of these entities.

The number of registered organizational entities which conduct activity (one or more) involving the exposure to ionizing radiation, which under the Atomic Law Act, is subject to regulatory supervision of the PAA President amounted to 3451 (as of 31 December 2013), whereas the number of registered activities involving exposure – 4914.

The latter is much bigger than the number of organizational entities since there are a lot of entities which conduct many different activities (some of them even several activities of the same type on the basis of separate licenses).

The classification of activities relating to exposure to ionizing radiation according to the type of ionizing radiation source and purpose of its use is shown in Table 1.

Table 1. Organizational entities conducting activities which involve exposure to ionizing radiation (as of 31 December 2013)

Organizational entities (according to types of activities conducted)	Number and symbolof entities	
Laboratory of class I	1	Laboratory of class I
Laboratory of class II	89	Laboratory of class II
Laboratory of class III	117	Laboratory of class III
Laboratory of class Z	93	Laboratory of class Z
Smoke detector service	368	Smoke detector service
Device service	152	Device service
Isotope device	551	Isotope device
Manufacture of isotopic sources and devices	23	Manufacture of isotopic sources and devices
Trade of isotopic sources and devices	62	Trade of isotopic sources and devices
Accelerator	66	Accelerator
Isotope applicators	36	Isotope applicators
Telegamma therapy	4	Telegamma therapy
Radiation device	36	Radiation device
Gamma graphic apparatus	110	Gamma graphic apparatus
Storage facility of isotopic sources	37	Storage facility of isotopic sources
Works with sources outside registered laboratory	51	Works with sources outside registered laboratory
Transport of sources or waste	438	Transport of sources or waste
Chromatograph	223	Chromatograph
Veterinary X-ray apparatus	764	Veterinary X-ray apparatus
X-ray scanner	382	X-ray scanner
X-ray defectoscope	184	X-ray defectoscope
Other X-ray apparatus	367	Other X-ray apparatus

IV. 2. LICENSES AND NOTIFICATIONS

Drafts of the PAA President's licenses for the performance of activities involving exposure to ionizing radiation and other decisions in matters important for nuclear safety and radiological protection were prepared by the Radiological Protection Department of PAA.

In cases when activities involving ionizing radiation did not require authorization, decisions were made with regard to the receipt of notification on the performance of activities connected with the exposure to ionizing radiation. These cases are specified in the Regulation of the Council of Ministers of 6 August 2002 on the cases when activities involving exposure to ionizing radiation do not require authorization or notification and on the cases when such activities may be conducted on the basis of notification (Journal of Laws, No 137, Item 1153 with later amendments).

The number of licenses, annexes to licenses issued (in case of amendments to conditions of the licenses already held) and notifications received in 2013 is shown in Table 2.

Table 2. Number of licenses issued and notifications received in connection with exposure to ionizing radiation in 2013

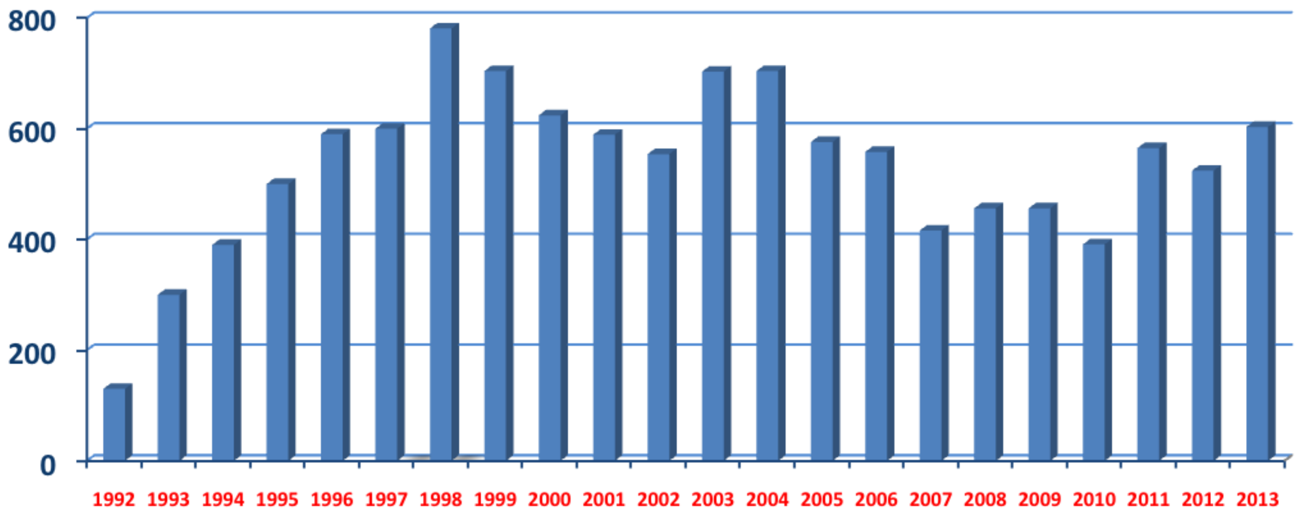
Type of activities	Number of activity types in organizational entities (as of 31 December 2013)	In 2013 the following authorizations were issued in the number shown below:		
		licenses	annexes	decisions on registration
Laboratory of class I	1	0	Laboratory of class I	1
Laboratory of class II	100	11	Laboratory of class II	100
Laboratory of class III	234	11	Laboratory of class III	234
Laboratory of class Z	166	8	Laboratory of class Z	166
Smoke detector service	368	9	Smoke detector service	368
Device service	162	26	Device service	162
Isotope devices	685	19	Isotope devices	685
Manufacture of isotopic sources and devices	26	2	Manufacture of isotopic sources and devices	26
Trade of isotopic sources and devices	66	9	Trade of isotopic sources and devices	66
Accelerator	107	21	Accelerator	107
Isotope applicators	45	7	Isotope applicators	45
Telegamma Therapy	4	2	Telegamma Therapy	4
Radiation device	37	2	Radiation device	37
Gamma graphic apparatus	111	12	Gamma graphic apparatus	111
Storage facility of isotopic sources	39	4	Storage facility of isotopic sources	39
Works with sources outside of registered laboratory	56	5	Works with sources outside of registered laboratory	56
Transport of sources or waste	448	11	Transport of sources or waste	448
Chromatograph	266	0	Chromatograph	266
Veterinary X-ray apparatus	783	115	Veterinary X-ray apparatus	783
X-ray scanner	468	63	X-ray scanner	468
X-ray defectoscope	199	15	X-ray defectoscope	199
Other X-ray apparatus	543	59	Other X-ray apparatus	543
In total:	**4914**	**411**	**In total:**	**4,914**

The issuance of license, annex to license or receipt of notification is always preceded by the analysis and assessment of documentation submitted by the users of ionizing radiation sources. The types of documentation required were specified in the Regulation of the Council of Ministers of 3 December 2002 on the documents required when applying for authorization to conduct activities involving exposure to ionizing radiation or when notifying the conduct of such activities (Journal of Laws No 220, Item 1851, with later amendments).

Apart from the said documentation, the analysis focuses on the following issues: justification for the commencement of activities involving exposure, proposed utility dose limits, quality assurance program in connection with activities conducted and company's emergency plan in case of radiation emergencies. The above figures do not concern nuclear facilities and radioactive waste processing and storage facilities.

Figure 2 shows information concerning the number of licenses and annexes issued in the period 1992–2013.

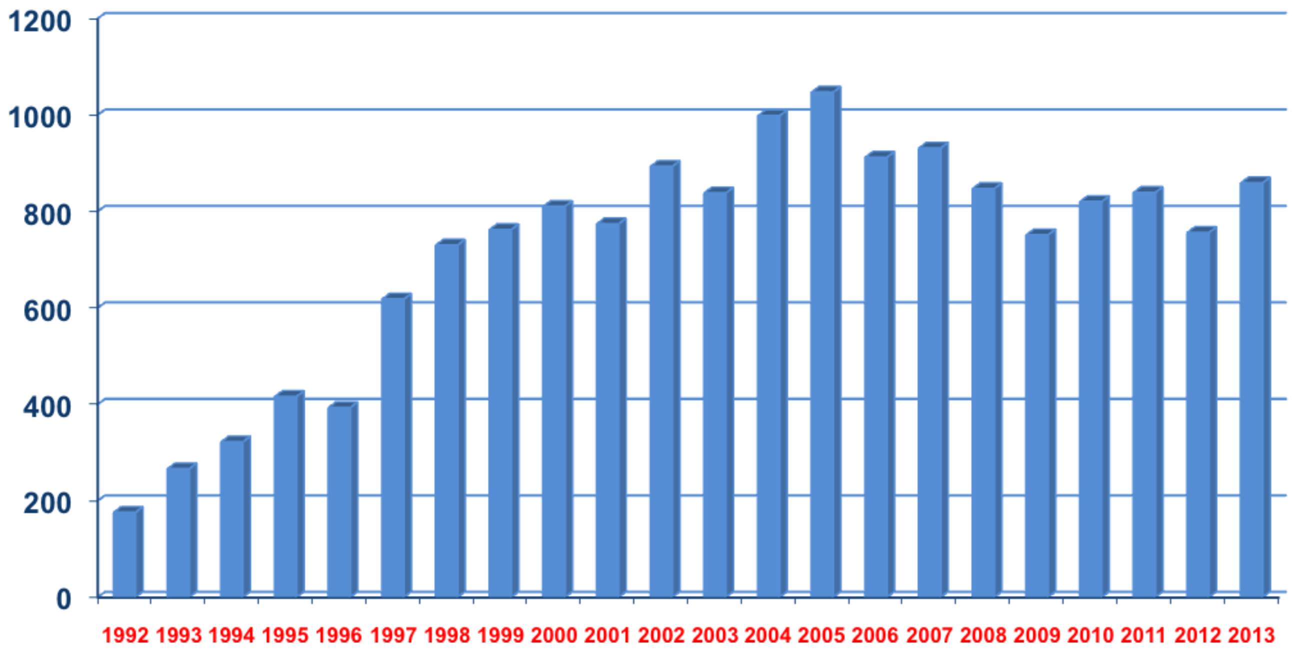
Figure 2. Number of licenses for the performance of activities involving exposure to ionizing radiation and annexes to licenses issued by the PAA President in the period 1992–2013



IV. 3. REGULATORY INSPECTIONS

Inspections at organizational entities, other than those possessing nuclear facilities or radioactive waste processing installations and storage facilities, were performed by the Nuclear Regulatory Inspectors from the PAA Radiological Protection Department working in Warsaw, Katowice and Poznań. In 2013 there were 859 such inspections performed, including 17 re-inspections (second inspection performed in the same year), out of which 344 inspections were carried out by the RPD inspectors from Warsaw, 340 – by inspectors from the RPD unit in Katowice and 175 – by inspectors from Poznań unit. Prior to the commencement of every inspection, a detailed analysis of documentation was performed concerning an inspected organizational entity and activities it conducts from the viewpoint of initial assessment of potential 'critical points' of the activities conducted and the quality system applicable at a given entity (Figure 3).

Figure 3. Number of inspections carried out by the PAA Radiological Protection Department in the period 1992–2013



In order to ensure suitable frequency of inspections, new cycles of inspections were agreed for particular groups of activities, depending on the threat posed by a given group of activities. At the same time, on the basis of inspections that had been performed in recent years, a group of activities was determined, which from the viewpoint of assessment of hazards involved in such activities and due to an improvement to safety culture of staff performing such activities, do not require direct supervision in the form of routine inspections or the said inspection is useless. Ad-hoc inspections in entities performing specified activities are carried out only occasionally and the supervision over such activities is based mainly on analysis of: reports on activities, records concerning sources and submitted declarations of shipment.

Data regarding inspections performed by the Nuclear Regulatory Inspectors from the PAA Radiological Protection Department in 2013 is shown in Table 3. Symbols used in this table were defined in Table 1.

Table 3. Number and frequency of inspections carried out in 2013 by the PAA Radiological Protection Department

Symbols according to activities conducted	Number of inspections in 2013	Frequency of inspections
I	2	every years
II	54	every 2 years
III	46	every 3 years
Z	58	every 4 years
UIC	35	ad hoc
UIA	47	every 3 years
AKP	88	every 3 years
PRO	9	every 3 years
DYS	4	ad hoc
AKC	65	every 2 years
APL	25	every 2 years
TLG	2	every 2 years
URD	6	every 3 years
DEF	56	every 2 years
MAG	14	every 3 years

TER	12	every 3 years
TRN	7	ad hoc
CHR	1	ad hoc
RTW	73	ad hoc
RTS	26	ad hoc
RTD	96	every 2 years
RTG	131	every 3 years

IV. 4. REGISTER OF SEALED RADIOACTIVE SOURCES

The obligation on maintaining sealed radioactive sources registry results from Article 43c, Section 1 of the Atomic Law Act of 29 November 2000. Pursuant to Section 3 of the aforesaid article, heads of organizational entities which perform, in accordance with valid authorization, activities involving application or storage of sealed radioactive sources or equipment endowed with such sources, are obliged to submit to the PAA President copies of records concerning radioactive sources. The documentation includes accountancy containing the following data about sources: name of radioactive isotope, activity according to the source certificate, date when activity was specified, number of certificate and source type, storage flask type or name of equipment and place of source use or storage. The heads of organizational entities are obliged to file the copies of records to the PAA President by 31 January each year.

Data obtained from accountancy cards is entered in the register of sealed radioactive sources, which is used to verify information about sources. Information contained in the said register is used to control organizational entities conducting activities connected with exposure to ionizing radiation. The inspection consists in comparing the record entries with the scope of authorization issued. Data from the register is also used to prepare information and statements for bodies of governmental and local administration for the purpose of mutual cooperation and statistics. Detailed information about selected isotopes and sources containing them as entered in the register of sealed radioactive sources is shown in Table 4.

Detailed information about selected isotopes and sources containing them as entered in the register of sealed radioactive sources is shown in Table 4.

Table 4. Selected radioactive isotopes and sources containing them classified into particular categories

Isotope	Number of sources in the registry		
	Category 1	Category 2	Category 3
Co-60	560	1,346	2,581
Ir-192	257	41	
Cs-137	71	330	2,236
Se-75	174	-	3
Am-241	2	409	954
Pu-239	3	120	104
Ra-226	-	80	61
Sr-90	-	19	807
Pu-238	-	77	19
Kr-85	-	28	200
Tl-204	-	-	88
other	6	127	1,371

The register includes data from 23,089 sources, including spent radioactive sources (withdrawn from operation and shipped to the Radioactive Waste Management Plant in Otwock-Świerk) and also information concerning their movement (i.e. date of receipt and shipment of source) and associated documents. The register software allows to identify a source on the basis of a certificate number and determine its current activities and the use or storage place, it also allows to identify current and previous users of the source. Depending on the purpose and activity of the source, and type of radioactive isotope contained in the source, the register software allows to classify a given source into different categories in accordance with the recommendations of the International Atomic Energy Agency:

- Category 1 includes sealed radioactive sources used in such fields as: teleradiotherapy in medicine, industrial radiography, radiation technologies.

The register contains 1073 sources of this category which are currently in operation (as of 31 December 2013).

- Category 2 includes sealed radioactive sources used in such fields as: medicine (brachytherapy), geology (borehole drilling), industrial radiography (mobile control and measurement instruments and stationary instruments in industry) including:
  - level and density meters containing Cs-137 sources with the activity exceeding 20 GBq and Co-60 with the activity exceeding 1 GBq,
  - thickness meters containing Kr-85 sources with the activity exceeding 50 GBq, Am-241 with the activity exceeding 10 GBq, Sr-90 with the activity exceeding 4 GBq and Tl-204 with the activity exceeding 40 GBq,
  - belt conveyor weighbridge containing Cs-137 sources with the activity exceeding 10 GBq, Co-60 with theactivity exceeding 1 GBq and Am-241 with the activity exceeding 10 GBq.

The register contains 2577 sources in this category (as of 31 December 2013).

- Category 3 covers other sealed radioactive sources, including those used in stationary control and measurement instruments.

The register contains 8424 sources in this category (as of 31 December 2013).

Spent sealed radioactive sources transferred to the Radioactive Waste Management Plant

NATIONAL
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V. OVERSIGHT OF NUCLEAR FACILITIES

V. 1. NUCLEAR FACILITIES IN POLAND

Nuclear facilities in Poland, in accordance with the Atomic Law, include: MARIA research reactor with its technological pool, which contains fuel burned-up during its operation; EWA research reactor (the first nuclear reactor in Poland, operated in years 1958–1995 followed by decommissioning process) and spent nuclear fuel storages.
These facilities are situated at Świerk at two separate organizational entities:

- MARIA reactor – at the National Centre for Nuclear Research (NCNR), formed in September 2011 from the Institute of Nuclear Matters and Institute of Atomic Energy POLATOM);
- EWA reactor (decommissioned to the brown field), as well as spent nuclear fuel storages (facilities No 19 and 19A) – at the Radioactive Waste Management Plant (RWMP), to which also belongs the National Radioactive Waste Repository at Różan.

Heads of these entities are, under the Atomic Law, responsible for safety of operation and physical protection of the nuclear facilities and materials.

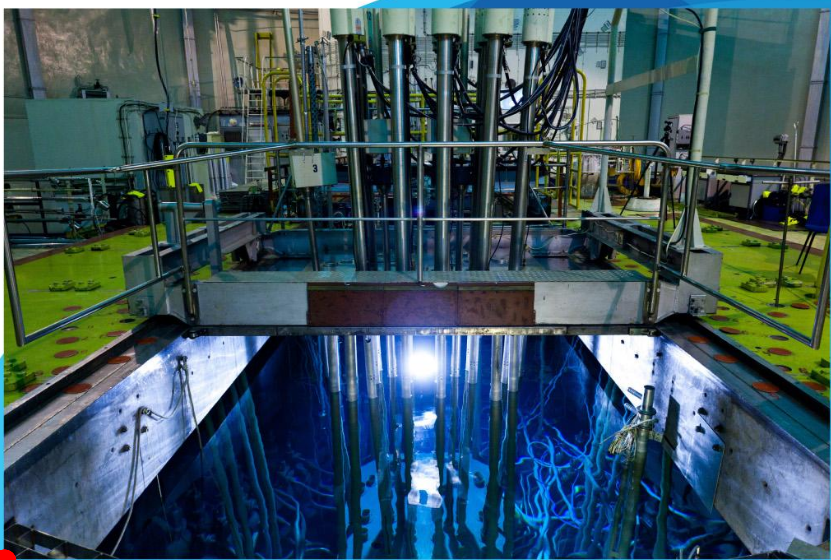


Image of MARIA reactor pool at the Institute of Atomic Energy POLATOM/ National Centre for Nuclear Research (NCNR)

1.1. MARIA reactor

MARIA research reactor is from the historical perspective the second research reactor and at present the only operating nuclear reactor in Poland. It is a high-flux pool-type reactor with design nominal thermal power of 30 MWt and maximum density of thermal neutron flux in the core of $3{,}5 \cdot 10^{18}$ n/(m^2·s). The reactor core is at present being converted from Russian high enriched fuel (HEU – High Enriched Uranium), marked with MR symbol into French low enriched fuel (LEU – Low Enriched Uranium), designated with MC symbol.

MARIA reactor has been in operation since 1975. In years 1985–1993 the reactor operation was stopped for its essential modernization, including installation of a passive system designed for filling reactor's core with water from reactor pool. From April 1999 to June 2002 the experts undertook the conversion of the reactor core decreasing the enrichment of fuel from 80% to 36% of U-235 isotope content. This process was performed gradually in 106 subsequent cycles of reactor's operation.

In accordance with the Global Threat Reduction Initiative (GTRI) program, the conversion of MARIA reactor to low enriched uranium (LEU) fuel (below 20% of U-235) has been started. A conversion into this fuel type requires the performance of operational tests. For this purpose, in 2009 two fuel elements marked with MC symbol were loaded in MARIA reactor's core, with enrichment 19.75%, containing 485 g of U-235 isotope, which had been manufactured by CERCA Company owned by French AREVA Company. The tests of the said elements were completed in 2011. The results and visual inspections of spent fuel elements in the technological pool confirmed their good quality and suitability for MARIA reactor. Upon obtaining the consent of the PAA President, in September 2012 the conversion of reactor core into low enriched fuel started by loading into the core first fuel element MC. At present new components are being gradually loaded replacing the high enriched fuel used so far. The use of new fuel required the change of the fuel channels cooling system and ensuring the suitable the coolant (water) flow through the new fuel elements with low enriched fuel.

In 2013 a modernization of this system was carried out by the replacement of main circulation pumps of into the pumps of higher power output. As a result of the modernization of cooling system in 2013 the reactor was not operated in the period from 28 May to 13 September. Apart from this period the reactor's operation schedule was set up in order to:

1) irradiate uranium targets necessary for the production of Mo-99 molybdenum isotope for the American Company Mallinckrodt Pharmaceuticals. The task was performed in 16 operational cycles.
2) irradiate target material for Radioisotope Centre POLATOM – intended for the production of radioactive agents for medical purposes, furthermore, for the Institute of Chemistry and Nuclear Technology, as well as to irradiate crystals used in jewellery manufacture and for silicon doping in electronics. The Figure 4 shows the statistics concerning irradiation of target material (from 1978 to 2013, inclusive). In 2013 the operation of MARIA reactor consisted of 3180 hours in 26 fuel cycles presented in Figure 5.

Figure 4. Material irradiated in MARIA reactor till 2013. National Centre for Nuclear Research

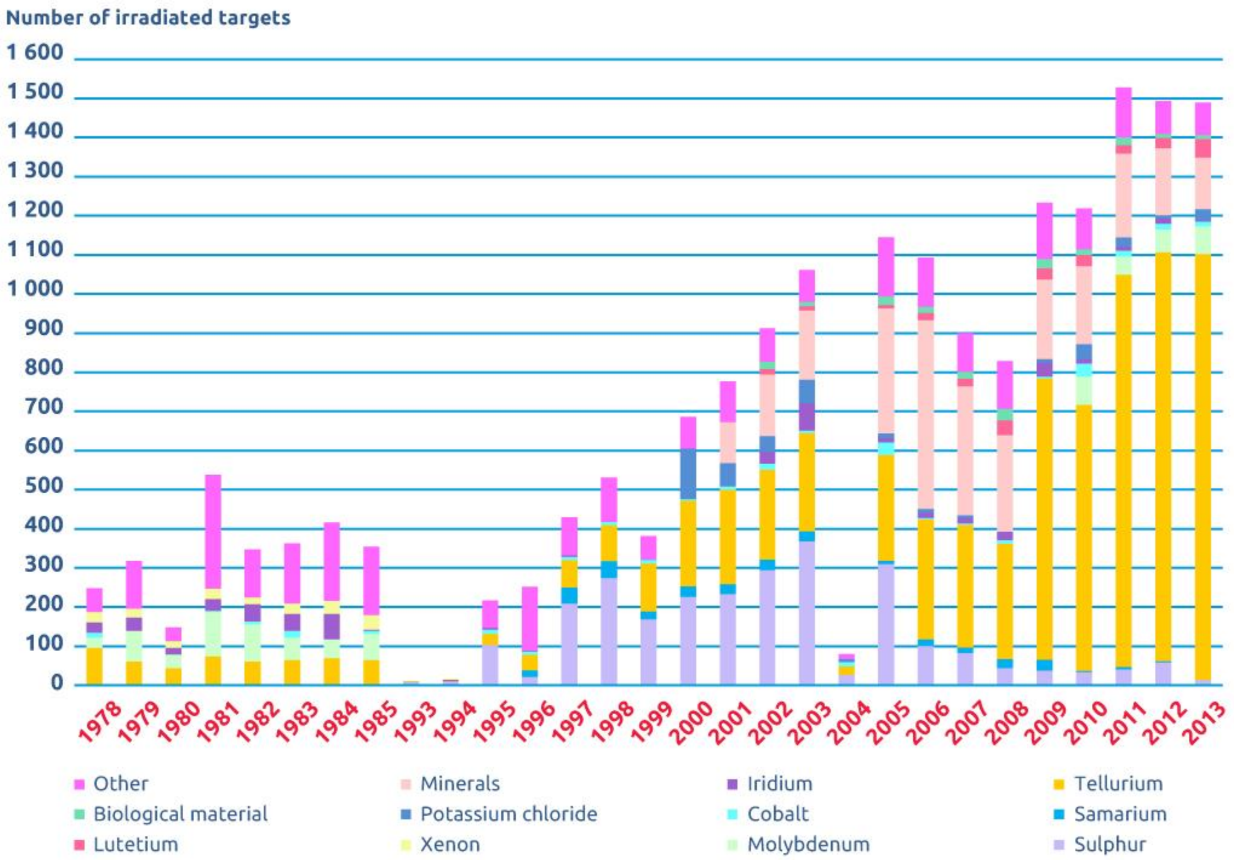


Table 5. General information concerning MARIA reactor's operation in 201347

Quarter		I	II	III	IV	In total
Number of operational cycles		11	4	3	8	26
Time of operation at nominal power [h]		1320	496	350	1014	3180
Reactor power [MWt]		22-23	22-23	22-23	22-23	22-23
Number of fuel elements in the core		22-23	22-23	22-23	22-23	22-23
Unplanned reactor scrams		1	0	0	3	4
Reasons	human error	0	0	0	3	3
	leak in cooling system	0	0	0	0	0
	instrument malfunction	1	0	0	0	1
Malfunctioning and irregularities found		1	0	1	3	5
Repairs and maintenance works performed		3	8	11	4	26
Tests, verification and overhauls made		12	8	18	37	75

The summary of general information concerning the reactor's operation is shown in Table 5.

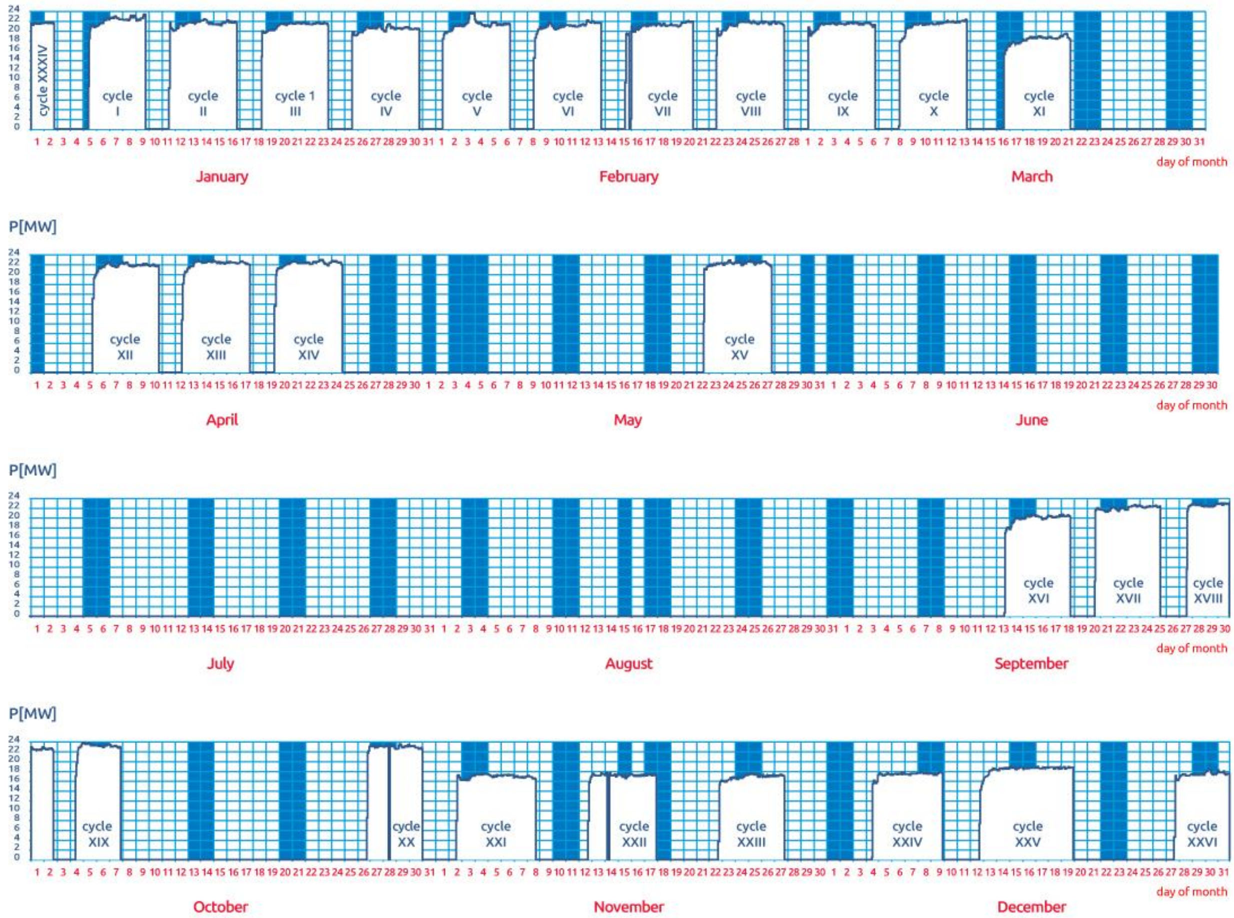
In comparison with the previous year, the total number of unplanned scrams did not change and the number of tests, verifications and overhauls was on the same level as in the previous years.

The research reactor MARIA has been used as a thermal neutron source for condensed matter studies performed with neutron diffractometers and spectrometers at the horizontal tubes (H-3 to H-8). The main topics studied in 2013 were:

- determination of atomic and magnetic short-range order in Mn-Cu-Ni alloy after 8 hours of annealing,
- neutron radiography examinations of archaeological objects from Czersk (near Warsaw) excavation site,
- small angle neutron scattering investigation of nanoscopic structures in ancient art bronze items,
- elastic neutron scattering on quenched Mn-Ni-Cu alloy at large momentum transfers,
- time evolution of neutron image statistical characteristics during drying of corundum layers saturated with water or aqueous $CdCl_2$ solutions,
- influence of salt concentration and material grain size on drying kinetics of rectangular blocks of particulate corundum saturated with aqueous solutions of NaCl and $CdCl_2$,
- small angle neutron scattering studies of phase decomposition in Mn-Ni-Cu alloy,
- magnetic fluctuations in quenched Mn-Ni-Cu alloy at RT,
- neutron radiography studies of drying of aerated concrete cylinders wetted with water or saturated aqueous solution of NaCl,
- nano-inhomogeneities in grains of clinoptilolite after saturation with sodium chloride,
- tests of neutron and gamma ray flux in the MARIA neutron radiography facility.

The total opening time of 6 horizontal channels in 2013 amounted to approximately 5900 hours.

Figure 5. Summary of MARIA reactor’s operational cycles in 2013. NCNR



1.2. EWA reactor (decommissioned to the brown field)

EWA research reactor was operated in years 1958–1995 at the Institute of Nuclear Research, and after its winding-up, at the Institute of Atomic Energy. Initially, the reactor’s thermal power was 2 MWt, later it was increased to 10 MWt.

Started in 1997, the process of reactor decommissioning in 2002 reached the state which is said to be the end of the second phase. It means that nuclear fuel and all irradiated structures and components, whose activity level might have been hazardous from the viewpoint of radiological protection, were removed from the reactor.

The reactor building was renovated and the premises were adjusted to the needs of the Radioactive Waste Management Plant. A hot cell was constructed in the reactor hall for the purpose of high activity material reprocessing. This work was carried out by Babcock Noell Nuclear Company within the framework of Phare PL0113.02.01 project. Low enriched spent nuclear fuel designated with the symbol EK-10, which had been used at the initial stage of EWA reactor’s operation in years 1958–1967, was encapsulated in this hot cell.

EWA reactor hall in 1965 at the former Institute for Nuclear Research (at present the Radioactive Waste Management Plant) at Świerk

1.3. Spent nuclear fuel storages

In accordance with the Atomic Law Act, nuclear facilities in Poland include also water ('wet') spent nuclear fuel storages, i.e. facilities No 19 and 19A. Since January 2002, these storages are operated by the Radioactive Waste Management Plant which took supervisory control over the spent fuel stored in them.

The storage No 19 was used to store encapsulated low enriched spent fuel: EK-10 from EWA recator, whose shipment to the country of manufacturer (the Russian Federation) was performed in September 2012. This facility is also used as a place for storing some solid radioactive waste (components) from EWA reactor's decommissioning and from MARIA reactor's operation and also spent high activity gamma radiation sources.

The storage No 19A was used for storing highly enriched fuel, marked with the symbol: WWR-SM and WWR-M2 from the operation of EWA reactor in years 1967–1995, and also to store encapsulated MR nuclear fuel from the MARIA reactor operation in years 1974–2005. Because all spent nuclear fuel from storage No 19A was shipped to the Russian Federation in 2010, this storage is currently used as a backup for the purpose of spent fuel storage from MARIA reactor in case of emergency.

Spent nuclear fuel storage No 19A at the Radioactive Waste Management Plant

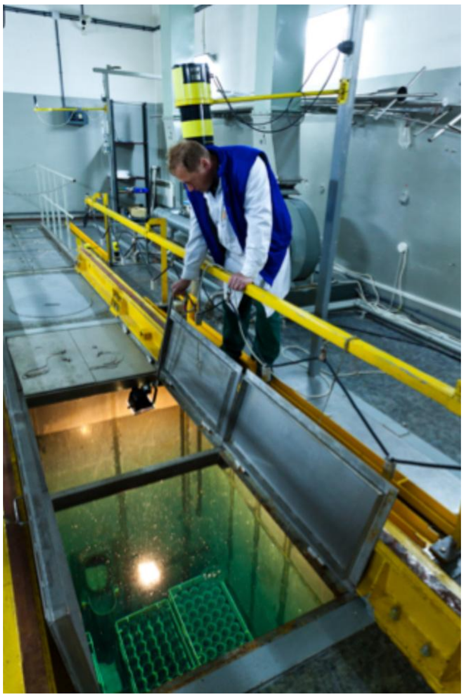


Table 6. Spent nuclear fuel stored in water pools at the POLATOM Radioisotopes Centre/ NCNR (MARIA reactor) and the Radioactive Waste Management Plant (EWA reactor) at Świerk as of 31 December 2013

Fuel from reactor	Fuel symbol	Storage facility	Number of elements
MARIA	MC	technological pool	5
	MR-6	technological pool	81

MARIA reactor’s technological pool is mainly used to store spent MR nuclear fuel and also MC fuel from the current reactor operation, which requires suitable cooling time before it is shipped in another place, for example to the manufacturer’s country or to the final spent nuclear fuel repository. In September of 2012, there was the last shipment of spent fuel from the reactor’s technological pool and in 2013 no other fuel elements were shipped from the pool.

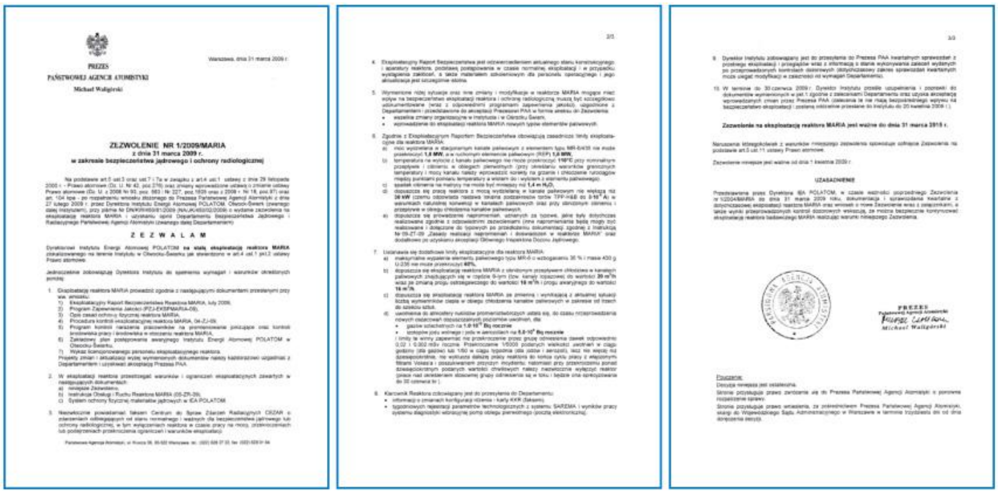
V. 2. LICENSES ISSUED

In 2012, MARIA reactor was operated on the basis of the PAA President’s license No 1/2009/MARIA of 31 March 2009 (license includes also operation of reactor’s technological pool with spent nuclear fuel stored in it). The said license is valid until 31 March 2015 and requires submission of quarterly reports on the reactor’s operation to the PAA President.

This license was supplemented in the previous years with many annexes and in 2013 with further three:

- No 9/2013/MARIA as of 4 January regarding admission for testing of low enriched MR fuel,
- No 10/2013/MARIA as of 31 January regarding amendment to operational conditions of MC fuel elements,
- No 11/2013/MARIA as of 25 October regarding operations of the reactor with modernized system for cooling fuel channel.

License of PAA President
No1/2009/MARIA


PREZES
PAŃSTWOWEJ AGENCJI ATOMISTYKI
Michał Waligórski

ZEZWOLENIE NR 1/2009/MARIA
z dnia 31 marca 2009 r.
w zakresie bezpieczeństwa jądrowego i ochrony radiologicznej

Z E Z W A L A M

EWA reactor (decommissioned to the brown field) and spent nuclear fuel storages are operated by the Radioactive Waste Management Plant on the basis of license No 1/2002/EWA of 15 January 2002. This license is valid for the indefinite period of time and requires reporting on the activities performed to the PAA President on a quarterly basis.

Licenses granted by the PAA President for the performance of activities at nuclear facilities are drawn up by the Nuclear Safety Department (NSD) at the PAA.

V. 3. REGULATORY INSPECTIONS

In 2013, the Nuclear Regulatory Inspectors from the PAA Nuclear Safety Department performed 24 inspections concerning nuclear safety and radiological protection, as well as physical protection of nuclear material and nuclear facilities, including: 20 inspections at the National Centre for Nuclear Research, 3 inspections at the Radioactive Waste Management Plant and 1 inspection connected with the transit through Poland of spent fuel from the Czech research reactor.

The inspections carried out at the NCNR were concerned with MARIA reactor and focused, among others, on the verification and assessment of:

- modernization of the reactor's fuel channel cooling system, including inspections at the stage of preparation and modernization, verification of the factual state with as-built documentation, verification of the conduct of pressure and functional tests, checking the algorithms relating to controlling new pumps, start-up and operation of the reactor after the interruption for modernization of fuel channel cooling system,
- compliance of current operations and start-up documentation of MARIA reactor with license,
- status of radiological protection in the reactor's facility,
- status of physical protection of MARIA reactor's facility,
- fulfilment of recommendations from the inspections carried out in 2012,
- fulfilment of motions and decisions by nuclear regulatory bodies,
- preparation and performance of MARIA reactor core's conversion into low enriched fuel MC-5/485
- performance of the uranium targets irradiation process in MARIA reactor,
- compliance of reactor's start-up with approved procedures and instructions,
- status of testing low enriched fuel MR-6/485 in MARIA reactor core,
- performance of maintenance and renovation works in the reactor.

The inspections performed at the NCNR and the RWMP as well as the analysis of quarterly reports did not reveal any threats to nuclear safety or any incidents of infringement of the provisions on radiological protection or violation of the licenses' conditions or applicable procedures.

V. 4. FUNCTIONING OF COORDINATION SYSTEM FOR CONTROL AND OVERSIGHT OF NUCLEAR FACILITIES

In accordance with the provisions of the Atomic Law Act for the purpose of oversight and control of nuclear safety and radiological protection of nuclear facilities, nuclear regulatory bodies cooperate with other bodies of public administration taking into account competences and responsibilities of these authorities, in particular with the Office of Technical Inspection, National Fire Service, inspection bodies for environmental protection, building inspection bodies, National Sanitary Inspection authorities, National Labour Inspection and Internal Security Agency.

The Atomic Law Act lays down the principles for cooperation of the aforementioned administration bodies by establishing the coordination system for control and oversight of nuclear facilities referred to as 'the coordination system'. The management of coordination system was entrusted to the PAA President who was vested with a number of powers such as the possibility to convene meetings of the representatives of cooperating authorities and inviting for these meetings representatives of other authorities and services and also laboratories, expert organizations, certified experts and specialists who can render advice and support and ultimately contribute to the effectiveness of the system. The latter objective is also attained by establishing teams for particular issues concerning the coordination of control and oversight of nuclear facilities.

The cooperation between bodies included in the system entails in particular the exchange of information about conducted control activities, organization of joint trainings and exchange of experience as well as works in developing new legal acts and technical and organizational guidance.

In 2013, activities conducted in connection with the coordination system covered mostly the cooperation between the National Atomic Energy Agency (PAA) and Office of Technical Inspection which consisted in:

- starting the process aimed to implement the recommendations by the International Atomic Energy Agency in terms of developing and applying basic design basis threats (DBT); for this purpose, PAA organized workshops (in cooperation with IAEA Office of Nuclear Security) and working meeting with an inter- ministerial team; also the Interior Security Agency, the State Fire Service and other bodies which do not participate in the coordination system took part in activities concerning DBT,
- preparing opinions on draft regulations to the Act of Parliament on technical inspection regarding nuclear power plants:
  - Regulation of the Council of Ministers on types of technical devices subject to technical inspection in a nuclear power plant (Journal of Laws of 2014. Item 111);
  - Regulation of the Minister of Economy on technical conditions of technical inspection for technical devices or devices subject to technical inspection in a nuclear power plant (works regarding this draft continue);
- continuation of cooperation with Office of Technical Inspection which consists in expertise support from technical inspection while considering by the PAA President an application of the NCNR for consent to modernize cooling system of fuel channels of MARIA reactor.

V. 5. NUCLEAR POWER PLANTS IN NEIGHBOURING COUNTRIES

5.1. Nuclear power plants in a 300 km distance from the country's borders

In a distance of approximately 300 km from Poland's borders there are 8 operating nuclear power plants (23 power reactor units) with the total gross installed power of around 15 GWe (Figure 6) which is the same as in 2012. These nuclear units are as follows:

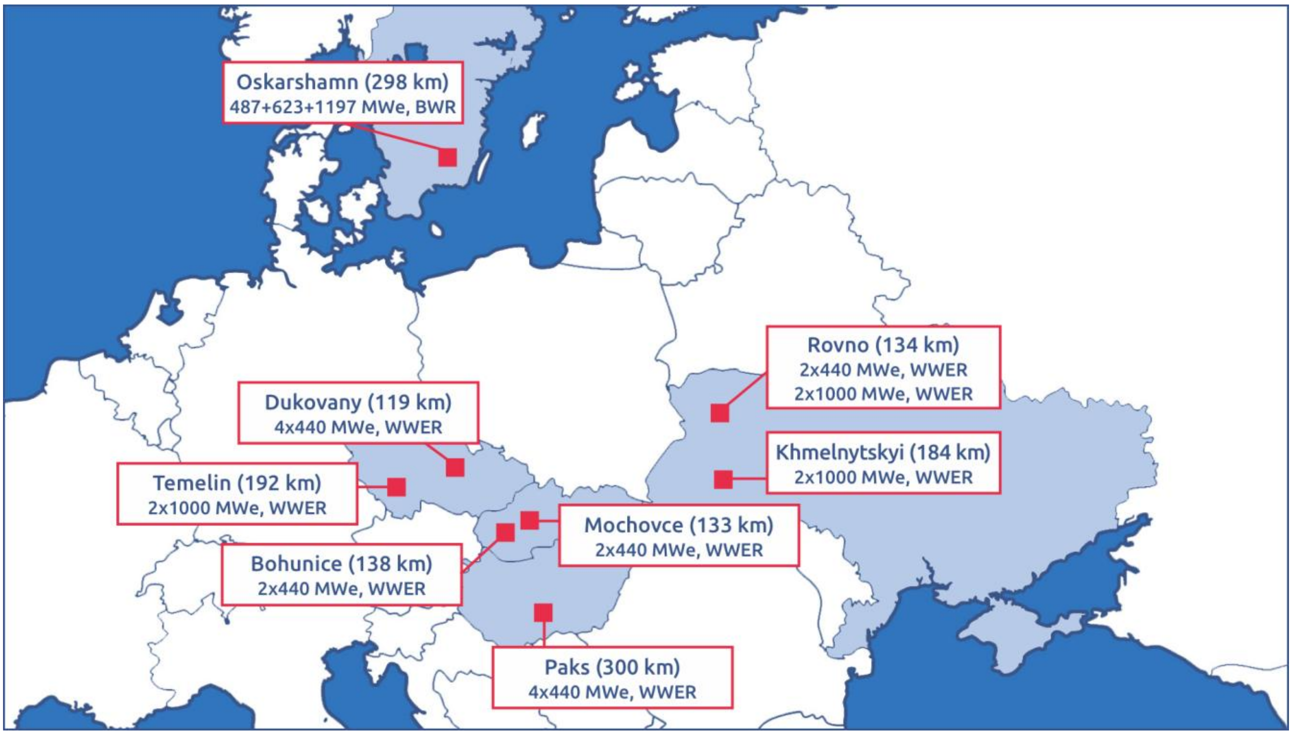
- 14 WWER-440 reactors (each of 440 MWe of nominal power):
  - 2 units at Rovno NPP (Ukraine),
  - 2 units at Bohunice NPP (Slovakia),
  - 2 units at Mochovce NPP (Slovakia),
  - 4 units at Paks NPP (Hungary),
  - 4 units at Dukovany NPP (Czech Republic);
- 6 WWER-1000 reactors (each of 1000 MWe of nominal power):
  - 2 units at Rovno NPP (Ukraine),
  - 2 units of Khmelnytskyi NPP (Ukraine),
  - 2 units of Temelin NPP (Czech Republic);
- 3 BWR reactors:
  - 3 units at Oskarshamn NPP (Sweden) – with nominal power of 487, 623 and 1197 MWe, respectively.

In the same distance there are two nuclear power plants which are at permanent shutdown stage and are undergoing decommissioning process:

- NPP Ignalina (Lithuania) – 2 units of RBMK type with the nominal power of 1300 MWe shut down in 2004 and 2009, respectively,
- NPP Barsebäck (Sweden) – 2 units of BWR type with the nominal power of 600 MWe shut down in 1999 and 2005, respectively and
- 2 reactors in the NPP Bohunice (Slovakia) – WWER-440 type with the nominal power of 440 MWe shutdown in 2006 and 2008, respectively, and also a nuclear power plant shut down after Fukushima accident in 2011:
- EJ Krümmel (Germany) – 1 unit of BWR type with the nominal power of 1315 MWe.

Due to the fact that the operation of these power units may theoretically create radiation risks for the population of Poland, bilateral intergovernmental agreements were signed with respective nuclear regulatory authorities of the neighbouring countries (see chapter XIII.2.).

Figure 6. Nuclear power plants located in the distance of 300 km from Poland's border



5.2. Operating data of nuclear power plants in neighbouring countries

On the basis of information published by the IAEA, operating data of nuclear power plants located in the distance of 300 km from Poland's borders was summarized in Table 7 below.

Table 7. Basic information and operating parameters of all reactors located in the vicinity of Poland's borders (data obtained from IAEA 24.03.2014)

Reactor	Reactor Type Share in Nuclear Power	Gross Electrical Power [MWe]	Year of Commissioning	Production of Electrical Power [TWh]	Utilization Factor [%]	
					2013 Yearly Factor	Long-term Factor (cumulated)
Czech Republic	35.9%					
Dukovany-1	WWER-440/213	500	1985	3.78	92.2	84.9
Dukovany-2	WWER-440/213	500	1986	3.69	89.4	85.1
Dukovany-3	WWER-440/213	500	1986	3.54	86.4	84.3
Dukovany-4	WWER-440/213	500	1987	3.73	90.4	85.5
Temelin	WWER-1000/320	1056	2000	7.02	82.1	72.0
Temelin	WWER-1000/320	1056	2002	7.35	84.4	78.0
Slovakia	51.7%					
Bohunice-3	WWER-440/213	505	1984	3.73	90.1	70.8
Bohunice-4	WWER-440/213	505	1985	3.79	90.8	73.3
Mochovce-1	WWER-440/213	470	1998	3.53	92.3	83.6
Mochovce-2	WWER-440/213	470	1999	3,58	93.0	82.7
Sweden	38.1% (92012)					
Oskarshamn-1	ABB BWR	492	1971	0.54	13.1	70.8
Oskarshamn-2	ABB BWR	661	1974	1.74	31.0	73.3
Oskarshamn-3	ABB BWR	1450	1985	9.44	77.0	82.7
Ukraine	43.6%					
Khmelnytskyi-1	WWER-1000/320	1000	1987	6.88	82.6	74.7
Khmelnytskyi-2	WWER-1000/320	1000	2004	7.03	84.4	75.9

Rovno-1	WWER-440213	420	1980	1.51	45.2	74,7
Rovno -2	WWER-440/213	415	1981	2.25	68.2	77.4
Rovno -3	WWER-1000/320	1000	1986	6.06	72.9	67.7
Rovno -4	WWER-1000/320	1000	2004	5.05	60.6	64.3
Hungary	50.7%					
Paks-1	WWER-440/213	500	1982	3.83	93.1	87.0
Paks-2	WWER-440/213	500	1984	3.79	91.6	81.6
Paks-3	WWER-440/213	500	1986	3.05	73.7	87.0
Paks-4	WWER-440/213	500	1987	3.85	93.0	89.1

The table contains data regarding:

1) share of nuclear power plants in the production of electrical energy in a given country;
2) current gross electrical power after all modernizations,
3) date of first connection to the grid (and not the date of commercial operation),
4) annual power utilization factor in 2013 (first column) and long term factor (cumulated) since the beginning of operation until 2013 (second column).

The information shown above in the table may be commented as follows:

1) Most reactors (12) were put into operation in years 1984–1987 and these are WWER-440 reactors which were subject of significant refurbishments increasing their nominal power and 2 reactors of the same type in Slovakia were put into operation after long-term interruption in the construction phase,
2) Remaining reactors (6) WWER-1000 were put into operation in years 1986–2004,
3) Reactors WWER-440 in 2013 operated with the utilization factor from 68.26 to 92.2%, and reactors WWER-1000 from 82.2 to 84.4% which shows that the reactors of the first type are more reliable,
4) Utilization factor for BWR reactors is significantly lower than for WWER (PWR) reactors,
5) Increase in the utilization of reactors in relation to long term power utilization factor (for 7 reactors which proves that they are more reliable in operation and the time needed for reloading of fuel - shutdown time),
6) Long-term utilization factor for Paks-2 reactor is definitely lower but it is the result of a long shutdown in years 2003–2004 as a consequences of an accident which occurred during cleaning fuel elements,
7) Oskarshamn-1 (Sweden) reactor was in the prolonged overhaul since 30 October 2011 due to: damage of blades in high-pressure stage of a turbine, necessity of correction of pipeline penetration holes, performance of general renovation of emergency Diesel generators and a number of other minor modifications.

5.3. Constructed and planned nuclear power plants near Poland’s borders

Poland’s neighbouring countries are constructing at present 3 reactors:

- 2 reactors in Mochovce NPP (Slovakia) of WWER-440 type, whose commissioning is scheduled for 2015 and 2016. These are the reactors of II generation whose construction started in 80s of the previous century, was interrupted and now is being completed after the introduction of a number of improvements in line with current safety requirements for reactors operating in the European Union.
- 1 reactor in Baltic NPP (Russian Federation) of WWER-1200 type, whose construction started in 2012.. The construction of this reactor is suspended at present and there are economic analyses being conducted at the moment regarding its use in consideration of the refusal to provide electrical energy to Poland and withdrawal from the construction of undersea cable to Germany and 3 more reactors are planned for the construction,
- 2 reactors at Ostrovets NPP (Belarus) of WWER-1200 type. The construction of the first unit started on 6 November 2013 and the opening is scheduled for 2018, however there is no information concerning the starting date for the construction of the second unit.,
- 1 reactor in Visaginas NPP (Lithuania, close to a shutdown nuclear power plant in Ignalina) but in 2013 the fulfillment of this investment was still discussed.

Nuclear power plant Bohunice in Slovakia

NATIONAL ATOMIC ENERGY AGENCY

VI. NUCLEAR MATERIAL SAFEGUARDS

VI. 1. USERS OF NUCLEAR MATERIAL IN POLAND

VI. 2. SAFEGUARDS INSPECTIONS

As regards safeguards of nuclear material, Poland fulfils its obligations resulting from the following international regulations:

- The Treaty establishing the European Atomic Energy Community (EURATOM Treaty) of 25 March 1957. This Treaty came into force on 1 January 1958. In Poland the provisions of the Treaty have been applicable since Poland's accession to the European Union;
- III Article of the Treaty of the Non-proliferation of Nuclear Weapons (NPT). The treaty came into force on 5 March 1970, and in 1995 was extended for the indefinite period of time. Poland ratified the Treaty on 3 May 1969 and it came into force on 5 May 1970;
- Agreement between Poland, the European Commission and the International Atomic Energy Agency in connection with the implementation of Article III of the Treaty of the Non-proliferation of Nuclear Weapons known also as Trilateral Safeguards Agreement INFCIRC/193 enforceable since 1 March 2007;
- Additional Protocol to the Trilateral Safeguards Agreement in connection with the implementation of Article III of the Treaty of the Non-proliferation of Nuclear Weapons which came into force on 1 March 2007, INFCIRC/193/Add8;
- Regulation of the Commission (EURATOM) No 302/2005 of 8 February 2005 on the application of the EURATOM Safeguards (O.J. UE L54 of 28 February 2005).

At present there is so-called integrated safeguards system which is applicable in Poland. It was implemented under the trilateral safeguards agreement between Poland, the European Commission and the International Atomic Energy Agency - the bilateral safeguards Agreement between Poland and the IAEA was applicable till 28 February 2007. The PAA President is responsible for the execution of this agreement. The safeguard system consists of the independent quantitative verification of nuclear materials and technologies connected with the fuel cycle. Reviews carried out within the framework of this system include also the inspection of goods and technologies of the so called dual-use (since 2000). It is possible in countries which signed and implemented the safeguards agreement in connection with nuclear materials and also the Additional Protocol. On behalf of the PAA President, the PAA Non-proliferation Unit maintains a nuclear material registry. In matters regarding the inspection of export of strategic goods and dual-use technologies, it cooperates with the Ministry of Foreign Affairs, the Ministry of Economy, the National Border Guard and the Finance Ministry's Customs Service.

VI. 1. USERS OF NUCLEAR MATERIAL IN POLAND

Nuclear material in Poland is used by the following entities constituting separate material balance areas:

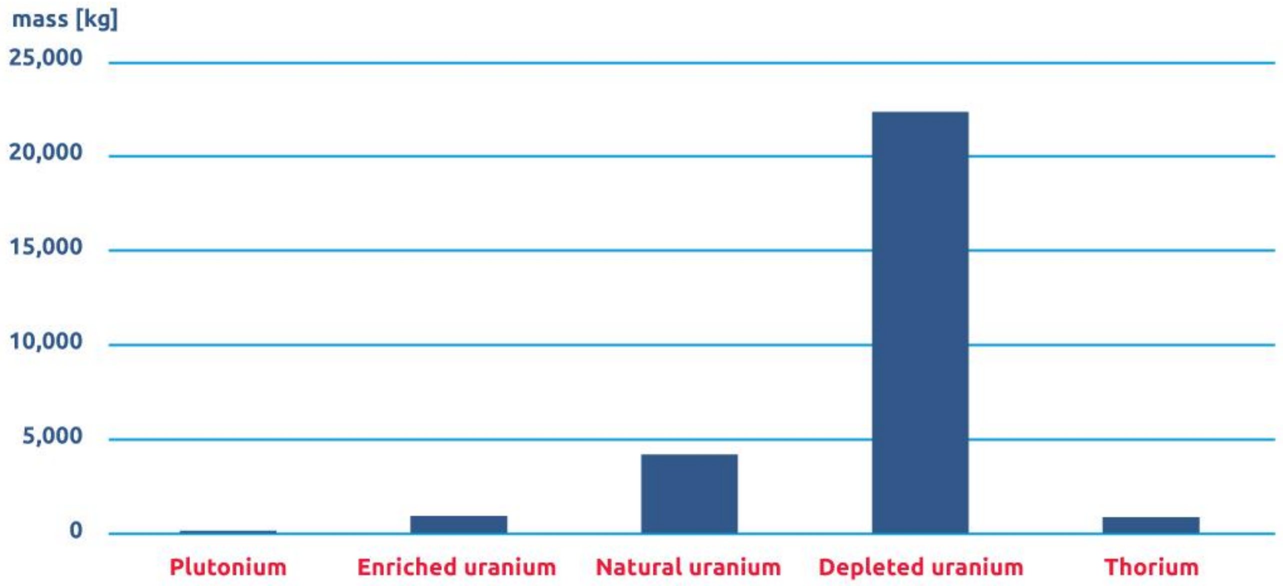
- The Radioactive Waste Management Plant which is responsible for spent nuclear fuel storages, shipment warehouse and the National Radioactive Waste Repository at Różan;
- The MARIA Reactor Operations Division and research laboratories of the National Centre for Nuclear Research (NCNR) at Świerk;
- The Radioisotopes Centre POLATOM/NCNR at Świerk;
- The Institute of Chemistry and Nuclear Technology in Warsaw;
- 26 medical and research entities using small quantities of nuclear material and 98 industrial, diagnostic and service entities which have got depleted uranium shields.

The research laboratories at NCNR at Świerk till October 2013 constituted an independent material balance area. Due to small quantities of nuclear material in this region, in agreement with EURATOM it was included in November 2013 to material balance region established by Operation Plant of MARIA Reactor.

In accordance with the requirements of the EURATOM Treaty and Regulation of the European Commission No 302/2005, any information regarding quantitative changes of nuclear material, held by particular users, must be transmitted to the system of nuclear material accountancy and control of the Nuclear Material Safeguards Office of the European Commission in Luxemburg. Copy of this information is also transmitted by users to the PAA. Reports prepared by the users of nuclear materials are submitted to the Commission and PAA by means of ENMAS Light program. The European Commission Safeguards Office transmits the copies of reports to the International Atomic Energy Agency.

Under the Global Threat Reduction Initiative (GTRI), the export of spent nuclear fuel from the Nuclear Centre at Świerk to Russian Federation was continued in 2013.

Figure 7. Balance of the nuclear material in Poland (as of 31 December 2013).



VI. 2. SAFEGUARDS INSPECTIONS

Nuclear regulatory inspectors from the Non-proliferation Unit of Nuclear Safety Department together with the IAEA and EURATOM inspectors performed 42 inspections of nuclear material safeguards inspections in 2013.

Having fulfilled the obligation resulting from the Additional Protocol to the Trilateral Agreement, the PAA submitted a declaration to EURATOM updating information about the technical or research activities, performed in Poland, relating to nuclear fuel cycle and information about the lack of export of goods specified in Annex II to the said Protocol, and also a declaration on the users of small quantity of nuclear material in Poland.

The inspections performed showed that there are no non-compliances concerning safeguards of nuclear material in Poland.

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VII. TRANSPORT OF RADIOACTIVE MATERIAL

VII. 1. TRANSPORT OF RADIOACTIVE SOURCES AND WASTE

VII. 2. TRANSPORT OF NUCLEAR FUEL
2.1. Fresh nuclear fuel
2.2. Spent nuclear fuel

In 2013, transport of radioactive material was carried out in accordance with the requirements of the following national regulations:

- Atomic Law Act of 29 November 2000,
- Transport of Dangerous Goods Act of 19 August 2011,
- Maritime Safety Act of 18 August 2011,
- Air Traffic Act of 3 July 2002,
- Transport Law Act of 15 November 1984.

Polish provisions of laws are based on the following international modal regulations such as:

- ADR (L'Accord européen relatif au transport international des marchandises Dangereuses par Route),
- RID (Reglement concernant le transport Internationale ferroviaire des marchandises Dangereuses),
- ADN (European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways),
- IMDG Code (International Maritime Dangerous Goods Code),
- ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air
- IATA DGR (International Air Transport Association – Dangerous Goods Regulation).

The aforesaid regulations concern different modes of transport of dangerous goods. In accordance with the above regulations, radioactive material is classified to Class 7 because of high risk of ionizing radiation.

Transport of radioactive materials takes place in accordance with transport regulations SSR-6 developed by the International Atomic Energy Agency for all types of transport. They are the basis for international organizations preparing the aforesaid international modal regulations or they are directly implemented to national legal framework. Thus they constitute basic legal form in international transport.

VII. 1. TRANSPORT OF RADIOACTIVE SOURCES AND WASTE

Pursuant to the obligations of Poland in relation to the IAEA, radioactive sources, classified into suitable categories, are shipped in accordance with provisions laid down in the Code of Conduct on the Safety and Security of Radioactive Sources and Guidance on the Import and Export of Radioactive Sources. The annual reports of organizational entities, which hold suitable licenses on transport and perform shipments of radioactive material, show that in 2013in Poland there were 23,044 shipments and 57,696 items were transported by road, rail, inland, sea and air.

While discussing the issue of transport of radioactive substances as a potential source of radiation hazards, it is necessary to mention attempts of illegal (that is without proper authorization or notification) transport of radioactive substances and nuclear material through Poland's borders.

Those attempts were prevented by the National Border Guard having at its disposal 218 radiation portal monitors installed at border crossing points and approx. 1145 mobile signalling and measurement devices. The control of trans-border movement of radioactive and nuclear material is also performed by officers of the Border Guard who completed specialists training in radiometric control and radiological protection.

In 2013 the posts of Border Guards performed the following inspections:

- inspection of transport of radioactive sources:
  - regarding import to Poland – 528 inspections
  - regarding transit, export from Poland – 1574 inspections
- inspection of transports of material containing natural radioactive isotopes:
  - regarding import to Poland – 4674 inspections
  - regarding transit, export from Poland – 8214 inspections
- inspections with regard to individuals treated or examined with radioactive isotopes – 918 inspections.

As a result of inspections, in 2013 the Border Guard stopped or withdrew 18 shipments and individuals involved in shipping goods. These cases concerned, among others, the lack of required authorizations for import and transport of radioactive substances and exceeding admissible norms for radioactive contamination.

In connection with the agreement between the United States Department of Energy and the Minister of Interior and Administration and the Minister of Finance of the Republic of Poland concerning cooperation in preventing the illicit trafficking of nuclear and other radioactive material, the National Border Guard received from American partner, like in 2012, the next supply of modern devices for border crossings. This equipment included modern stationary and mobile devices: spectrometers and radiation portal monitors which supported activities of the Border Guard at the airports and external border of the EU.

VII. 2. TRANSPORT OF NUCLEAR FUEL

Fresh and spent nuclear fuel is transported on the basis of an authorization granted by the PAA President. In 2013 there were 2 shipments of fresh and spent nuclear fuel in the territory of Poland.

2.1. Fresh nuclear fuel

In 2013 there was 1 shipment of fresh nuclear fuel with enrichment below 20% (LEU) from France for MARIA reactor at the National Centre for Nuclear Research at Świerk. MARIA reactor is undergoing conversion process from high enriched uranium to low enriched uranium (below 20%). This process is scheduled to be completed in 2014.

2.2. Spent nuclear fuel

In accordance with the implementation of the Global Threat Reduction Initiative in the transition from the use of high enriched fuel to low enriched fuel produced in the former Soviet Union in 2013 there was one transit shipment of spent high enriched nuclear fuel from the research reactor in the Czech Republic to the Russian Federation. During last 5 years (2009-2013) there were 7 exports of high enriched spent nuclear fuel (above 20% U-235) from Polish research reactors EWA and MARIA to the Russian Federation. The Radioactive Waste Management Plant is responsible for performing these shipments whereas the PAA President issues licenses for export and supervises its performance.

Due to the current process of the conversion of MARIA reactor into low enriched fuel, this reactor is still operating with the use of 36% enriched fuel (HEU). It is predicted that there will be 1 more shipments of high enriched spent nuclear fuel to the Russian Federation.

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VIII. RADIOACTIVE WASTE

Radioactive waste is generated as a result of the use of radioisotopes in medicine, industry and scientific research, production of open and sealed radioactive sources and during operation of research reactors. This waste is both of solid and liquid form. The group of liquid waste constitutes mainly radioactive substances as water solutions and suspensions.

Solid waste group includes spent sealed radioactive sources, personal protection items polluted with radioactive substances (rubber gloves, protective clothing, footwear), laboratory materials and equipment (glass, components of instruments, lignin, cotton wool, foil), used tools and elements of technological equipment (valves, parts of pipelines or pumps) as well as used sorptive and filtering materials applied in the purification of radioactive solutions or air released from reactors and isotope laboratories (used ionites, post-fallout sludge, filters input etc.). In order to classify radioactive waste, its activity and half-life is taken into consideration. There are the following categories of radioactive waste: low-, intermediate- and high- level radioactive waste, classified into three sub-categories: transitional, short- and long-lived; as well as disused sealed radioactive sources, classified to three categories also on the basis of activity criterion.

Radioactive waste containing nuclear material and spent nuclear fuel – treated separately – is subject to special provisions regarding management procedures at every stage (including storage and disposal). Radioactive waste may be stored for some period of time, however it is ultimately disposed. It should be pointed out that such terms as 'storage' and 'disposal' contain the notion of time – storage is a process limited in time until waste is deposited in repository, whereas disposal is final and indefinite in time. Re-processing and disposal of radioactive waste require reducing its production, segregating it, decreasing its volume, solidifying and packaging in a manner which guarantees that all the undertaken measures and barriers effectively isolate waste from humans and the environment.

Radioactive waste is stored in a way which ensures protection of humans and the environment in normal conditions and in radiation emergency, including the protection of radioactive waste against leakage, dispersion or release. To this end, there are especially dedicated facilities or premises (radioactive waste storages) endowed with equipment for mechanical or gravitational ventilation and for purification of air released from such premises.

Radioactive waste disposal is allowed only at the facilities dedicated to this purpose i.e. at repositories. According to Polish provisions, repositories are divided in two types: surface and deep, and during the licensing process as to the fulfilment of nuclear safety and radiological protection requirements, which rests within the competence of the PAA President, a detailed specification is prepared concerning types of radioactive waste of particular categories, which may be disposed at a given facility.

The Radioactive Waste Management Plant (RWMP) is responsible for the collection, transport, processing and disposal of waste generated by radioactive material users in Poland. The supervision over safety of waste management, including supervision over safety of waste disposal by the RWMP is performed by the PAA President. Before 1 January 2002, not only had the PAA President been responsible for the supervision over safety of waste management but he also supervised the waste management itself, including investigations for suitable sites where new radioactive waste repository could be constructed. At present, the latter two tasks are excluded from the scope of the President's responsibilities. The PAA President is no longer responsible for the site selection process regarding radioactive waste repository or for performing construction or operation of such repository. These issues are currently governed by the Minister of Economy.

The RWMP provides its services against payment, however revenue generated from this activity covers only a part of costs incurred by this enterprise. In 2013, missing funds were subsidized by the Ministry of Economy. The Radioactive Waste Management Plant operates facilities situated within the territory of Świerk centre, which are fitted with equipment for radioactive waste conditioning.

The National Radioactive Waste Repository (NRWR) at Różan near the Narew river (approx. 90 km from Warsaw) is the site of radioactive waste disposal in Poland. According to the IAEA classification, the NRWR is a surface type repository dedicated for disposal of short-lived, low- and intermediate- level radioactive waste (where half-life of radionuclides is less than 30 years). It is also used to store long-lived, mainly alpha radioactive waste, and also dissused sealed radioactive sources which are waiting to be placed in a deep repository (otherwise referred to as geological or underground repository). The Różan repository has been in operation since 1961 and is the only facility of this type in Poland. Due to the fact that the disposal space is running short, it is scheduled to be closed down in 2020–2023. In 2013 the Radioactive Waste Management Plant received 239 orders from 177 institutions to collect the radioactive waste. Quantities of radioactive waste which was collected and processed by the RWMP (including waste generated at the RWMP own premises) is shown in Table 8.

Table 8. Quantity of radioactive waste collected by the RWMP in 2013

Waste sources	Solid waste [m^3]	Liquid waste [m^3]
Outside Świerk centre (medicine, industry, research)	18.06	0.99
National Centre for Nuclear Research/Radioisotopes Centre POLATOM	8.80	0.38
National Centre for Nuclear Research –MARIA reactor	10.80	27.00
Radioactive Waste Management Plant	7.02	0.00
In total:	44.68	28.37

The inventory of collected solid and liquid waste in terms of its type and category is as follows:

- Low-level waste (solid waste) – 44.68 m^3
- Intermediate-level waste (solid waste) – 0.00 m^3
- Low-level waste (liquid waste) – 28.37m^3
- Intermediate-level waste (liquid waste) – 0.00 m^3
- Alpha radioactive waste – 2.88 m^3
- Smoke detectors – 16 287 items
- Disused sealed radioactive sources – 1 335 items.

After re-processing, radioactive waste in the solidified form is placed in drums of 200 dm^3 and 50 dm^3 capacity, and only then delivered for disposal.

In 2013 the National Radioactive Waste Repository received 92 drums of 200 litres each with processed waste. In addition, 15 non-standard containers were delivered to the repository. Disused radioactive sources which do not undergo treatment (there were in total 42 sources of this type delivered) are sealed in separate containers. Solid waste delivered to the repository amounted in total to 28.99 m^3 with the total activity of 1 848.2 GBq (data valid as of 31 December 2013).

Also the waste generated from dismantling of smoke detectors is submitted for the purpose of temporary storage.

The RWMP conducts radioactive waste management on the basis of two licenses of the PAA President:

- License No D-14177 of 17 December 2001 concerning activity related to the use of nuclear energy andconsisting in: transport, processing and storage in the territory of Świerk centre radioactive waste collected from organizational entities conducting activities connected with the use of nuclear energy from the territory ofthe whole country.
- License No 1/2002/KSOP – Różan of 15 January 2002 concerning the operation of the National Radioactive Waste Repository at Różan.
- License No 1/2002/EWA of 15 January 2002 for the decommissioning of EWA reactor and operation of spent nuclear fuel storages No 19 and 19A.

The said licenses are valid for the indefinite period of time and require submission of respectively annual and quarterly reports on performance of the licensed activities, which are analyzed by the Nuclear Regulatory Inspectors from the NSD at the PAA. Information contained in these reports is then reviewed during regulatory inspections.

In 2013 Nuclear Regulatory Inspectors performed 3 inspections on radioactive waste management at the RWMP, including:

- 1 inspection at the NRWR Różan site, covering issues of physical protection, radiological protection of employees, on-site and off-site environmental monitoring, cooperation between the RWMP and authorities of Różan county as well as the inspection of documentation of waste received for disposal, and current operational status of repository facilities,
- 2 inspections in the RWMP's facilities within the area of the nuclear centre at Świerk and it covered the review of documentation of received, utilized, re-processed and stored radioactive waste, review of technological processes of radioactive waste treatment and processing as well as the status of radiological protection of the RWMP's facilities in connection with radioactive waste management and the functioning of physical protection system of spent nuclear fuel storages.

Conclusions and observances from the conducted inspections were directly implemented by the RWMP's senior management. Non-compliances and errors established by Nuclear Regulatory Inspectors were remedied in accordance with provisions contained in inspection protocols or post-inspection statements.

It has to be stated that the performed inspections of radioactive waste disposed and stored at the National Radioactive Waste Repository and the Radioactive Waste Management Plant at Świerk near Otwock did not reveal any threats to humans and the environment.

Disposal line for the re-processing of low radioactive waste

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IX. RADIOLOGICAL PROTECTION OF POPULATION AND WORKERS IN POLAND

IX. 1. EXPOSURE OF POPULATION TO IONIZING RADIATION

Exposure of a statistical inhabitant to ionizing radiation, expressed as an effective dose is a sum of doses from natural radiation sources and artificial sources that is, created by a human. Ionizing radiation emitted by radionuclides, which constitute natural components of all the elements of the environment, and also cosmic radiation constitutes the first exposure group. The second group includes all artificial radiation sources, used in different areas of economic and scientific activities and for medical purposes, such as: artificial isotopes of radioactive elements and devices generating radiation for example X-ray devices, accelerators, nuclear reactors and other radiation devices.

Human radiation exposure may not be eliminated completely but only limited. For we cannot affect cosmic radiation or contents of natural radionuclides in the earth crust which have been in existence for billion years.

Therefore a limitation of radiation applies to exposure resulting from artificial ionizing radiation sources and the said limitation is determined with so-called dose limits which to the best of our scientific knowledge do not cause health detriment. It must also be emphasized that the said limits do not include natural radiation. In particular they do not include exposure to radon in houses, to natural radioactive radionuclides which constitute the part of human body, to the cosmic radiation on the earth level, and also exposure over the earth's surface to nuclides contained in the intact earth's crust. Neither do they include doses received by patients as a result of radiation for medical purposes and doses received by humans in radiation emergency that is in the circumstances where the radiation source remains out of control.

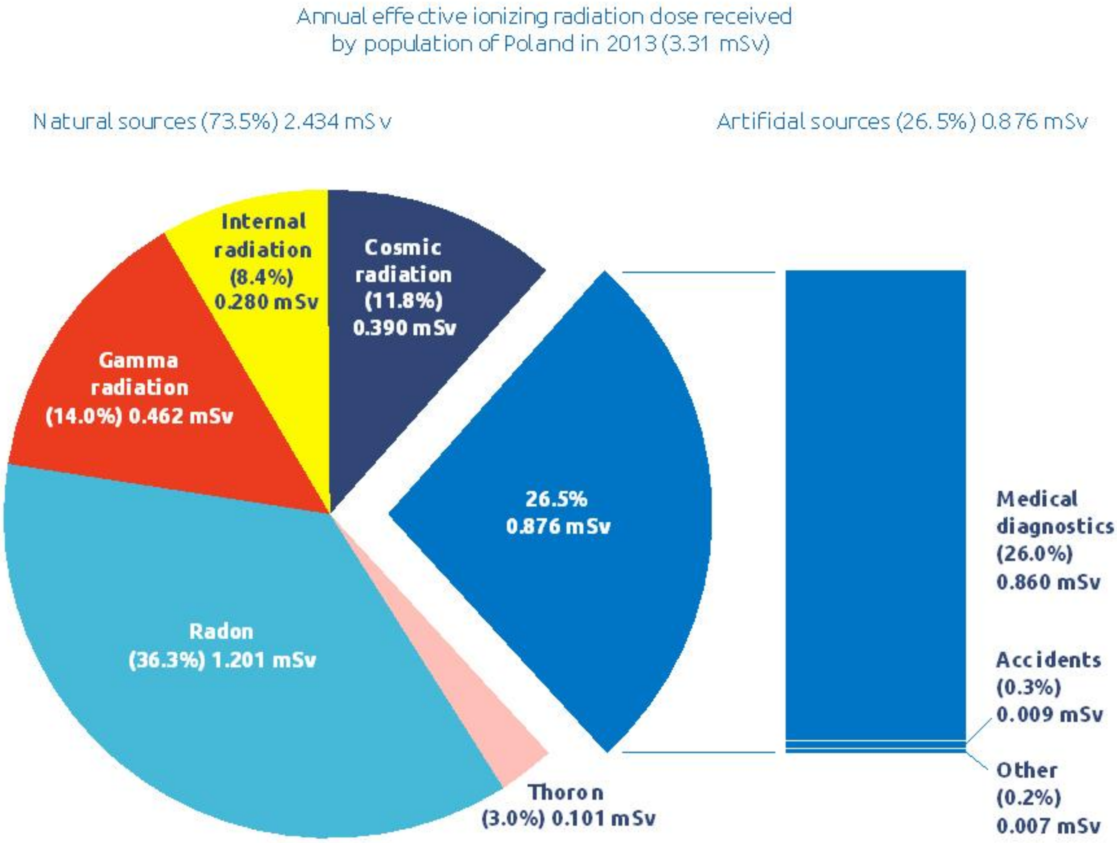
Exposure limits for the entire population include external radiation and internal radiation caused by radionuclides which enter human body through the ingested food or air breathed and are expressed, similarly to occupational exposure, as:

- effective dose illustrating the exposure of the whole body
- equivalent dose expressing the exposure of particular organs and body tissues.

The Regulation of the Council of Ministers of 18 January 2005 on ionizing radiation dose limits (Journal of Laws of 2005, No 20, Item 168) constitutes the basic national normative act which specifies the aforesaid limits. This deed also determines that a dose limit for the entire population (caused by artificial radiation sources) expressed in terms of an effective dose amounts to 1 mSv during a calendar year. This dose may be exceeded in a given calendar year on condition that in the period of next five years its sum total does not exceed 5 mSv.

It is estimated that an annual effective ionizing radiation dose received by a statistical inhabitant of Poland from natural and artificial ionizing radiation sources (including radiation sources applied in medical diagnostics) amounted in 2013 on average to 3.31 mSv, that is, it remained on the same level as in the previous years. A percentage share in the exposure to different radiation sources is shown in Figure 8. This value was estimated taking into consideration the data received from the Central Laboratory for Radiological Protection in Warsaw, the Institute of Occupational Medicine in Łódź and the Central Mining Institute in Katowice.

Figure 8. Share of different ionizing radiation sources in annual mean effective dose



Exposure to radiation from natural sources as shown in the Figure above, results from:

- radon and products of its decay,
- cosmic radiation,
- earth radiation that is radiation emitted by natural radionuclides which are contained in the intact earth's crust,
- natural radionuclides contained in the human body.

Figure 8 shows that in Poland – similarly to many European countries – exposure to natural sources constitutes 73.5% of the entire radiation exposure and expressed in terms of so called effective dose – amounts to approx. 2.434 mSv/per annum. Radon and radon decay products, from which a statistical Polish inhabitant receives a dose of approx. 1.201 mSv/per annum, have got the biggest share in the said exposure. It must be also noted that the exposure of statistical inhabitant of Poland to natural sources is by 1.5–2 times lower than inhabitants of Finland, Sweden, Romania or Italy.

The exposure of a statistical inhabitant of Poland in 2013 to radioactive sources applied for medical purposes; mainly in medical diagnostics including X-ray examinations and in vivo tests (that is administering to patients radioactive formulas) is estimated to amount to 0.86 mSv.

This dose includes above all doses received during computer tomography examination (0.33 mSv) as well as conventional radiography and fluoroscopy (0.38 mSv). In case of other diagnostic tests these doses are much lower. In tests where mammography was used, an annual effective dose which a statistical inhabitant of our country receives amounts to 0.02 mSv, in case of cardiac surgery procedures – 0.08 mSv and in nuclear medicine – 0.05 mSv.

An average effective dose as for a single X-ray examination amounts to 1.2 mSv, and for the most common tests, the amounts are as follows:

- chest X-ray – approx. 0.11 mSv,
- spine and lungs X-ray respectively from 3 mSv to 4.3 mSv;

The range of variability for the aforesaid amounts in reference to single examinations may even reach double value and may result from the quality of instruments and examination conditions which may differ significantly from normal standards.

It should be added that the above data may change in future due to the fact that X-ray equipment, which does not meet requirements provided for in the Council Directive 97/43/EURATOM of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing the Directive 84/466/Euratom, is being successively exchanged. It is also worth mentioning that exposure limits for population do not include exposure which results from the application of ionizing radiation for therapeutic purposes.

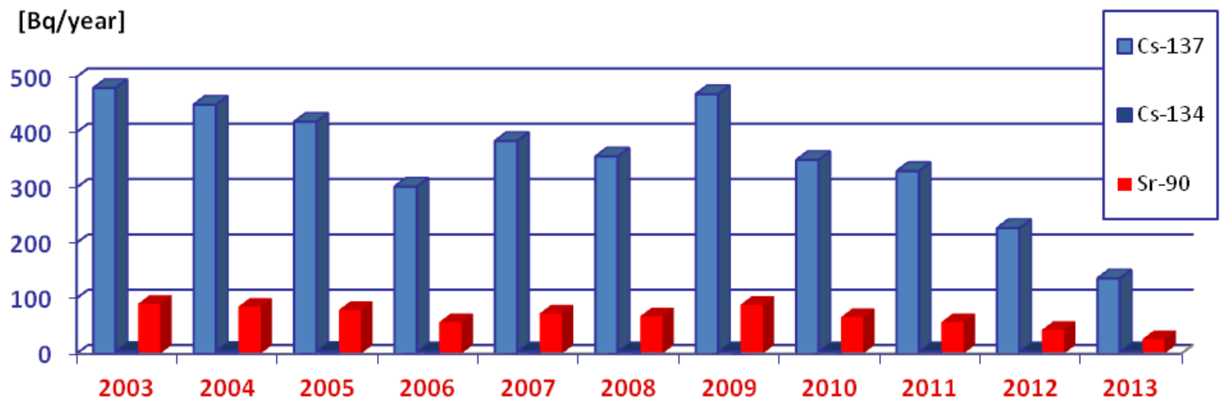
Radiation exposure caused by:

- the presence of artificial radionuclides in foodstuffs and the environment resulting from nuclear explosions and radiation accidents,
- the use of household articles which emit radiation or contain radioactive substances,
- occupational activity connected with the application of ionizing radiation sources, is subject to control and limitations resulting from international standards which determine exposure limits of the population. As it was said before, national regulations determine annual effective dose limit for the population which is 1 mSv. The amount of effective dose for a statistical Pole consists of three elements listed above.

The exposure of a statistical inhabitant of Poland to artificial radionuclides – mainly isotopes of caesium and strontium – in foodstuffs and the environment was estimated to amount to approx. 0.013 mSv (which constitutes 1.3% of a dose limit for the population), and the exposure to radionuclides in foodstuffs was estimated to amount to approx. 0.009 mSv (which constitutes 0.9% of a dose limit for the population).

The above amounts were calculated on the basis of measurements concerning contents of radionuclides in foodstuffs which constitute basic ingredients of an average diet, including updated data on the consumption of main ingredients. Similarly to recent years, the biggest exposure share concerns dairy products, vegetables (mainly potatoes), cereals and meat, whereas mushrooms, forest fruit and meat of wild animals, despite increased levels of caesium and strontium isotopes do not contribute significantly – owing to relatively low consumption of these products – to the said exposure. It is worth mentioning that the exposure to K-40 natural isotope, which commonly occurs in foodstuffs, amounts to approx. 0.17 mSv per annum, which is 20-times more than the exposure caused by artificial radionuclides. Data regarding annual absorption of artificial radionuclides with food in years 2003–2013 is shown in Figure 9.

Figure 9. Annual mean intake of Cs-134, Cs-137 and Sr-90 via ingestion (foodstuffs) in Poland in years: 2003–2013



Amounts illustrating exposure caused by radiation which is emitted by artificial radionuclides in such environmental components as: soil, air, open waters, were specified on the basis of measurements of the contents of particular radionuclides in samples of the environmental materials collected in different parts of Poland (the measurement results are discussed in chapter XI ‘Assessment of national radiation situation’). Taking into consideration local differences in Cs-137 isotope level, still present in soil and food, it is possible to estimate that the maximum dose amount may be about 4-5 times higher than an average amount which means that the exposure caused by artificial radionuclides does not exceed 5% of a dose limit.

The exposure to household articles amounted in 2013 to approx. 0.001 mSv, which constitutes 0.1% of a dose limit for the population. The said amount was stated mainly on the basis of measurements of radiation emitted by picture tubes and isotope smoke detectors and gamma radiation emitted by artificial radionuclides which are used to stain ceramic tiles or porcelain. The calculated amount included also a dose from the cosmic radiation received by passengers during air travels. Due to the common use of LCD screens and monitors instead of picture tube lamps, a dose which is received by a statistical Pole from these devices is continuously decreasing.

The exposure of a statistical Pole in his/her occupational activities involving ionizing radiation sources (read more about this problem in chapter IX.2 ‘Control of exposure to ionizing radiation at work’) in 2013 amounted to approx. 0.002 mSv, which constitutes 0.2% of a dose limit.

In 2013, the total exposure of a statistical Polish inhabitant to artificial ionizing radiation sources, exclusive of medical exposure (and with prevailing share of exposure resulting from Cs-137, present in the environment as a result of nuclear explosions and Chernobyl accident), amounted to approx. 0.016 mSv, that is 1.6% of a dose limit from artificial radioactive isotopes for the entire population, which is 1 mSv per annum and only 0.48% of a dose received by a statistical inhabitant of Poland from all ionizing radiation sources.

The data shown above allows to draw a conclusion that in the light of international and national provisions concerning radiological protection, the radiation exposure of a statistical inhabitant of Poland in 2013, which is a consequence of the use of artificial ionizing radiation sources, is negligibly small.

Device measuring ionizing radiation

IX. 2. CONTROL OF EXPOSURE TO IONIZING RADIATION AT WORK

2.1. Occupational exposure to artificial ionizing radiation sources

The performance of occupational duties in nuclear facilities, entities managing radioactive waste and other entities using ionizing radiation sources is a cause of radiation exposure of workers.

Principles concerning the control of people working in occupational exposure conditions have been applicable in Poland since 2002. These principles result from the implementation of the Council Directive 96/29/EURATOM of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers resulting from ionizing radiation (OJ EC L159 of 29 June 1996, p.1; OJ EU Polish edition, chap. 5, vol. 2, p.291).

Principles concerning exposure control (transposed from the directive to the laws of Poland) are included in Chapter 3 of the Atomic Law Act, dedicated to nuclear safety, radiological protection and protection of workers' health.

Under these provisions the responsibility for the compliance with requirements in this area rests firstly with a head of organizational entity who is responsible for the assessment of doses received by workers. This assessment (Article 21 of the Atomic Law Act) must be performed on the basis of results of environmental measurements or individual dosimetry carried out by specialized authorized radiometric laboratory. Measurements and assessment of individual doses were performed in 2013 by the following authorized laboratories, commissioned by interested organizational entities:

- Laboratory of Individual and Environmental Dosimetry, The H. Niewodniczanski Institute of Nuclear Physics in Cracow,
- Radiological Protection Unit, The J. Nofer Institute of Occupational Medicine in Łódź,
- Doses Control and Calibration Unit, Central Laboratory for Radiological Protection in Warsaw,
- Military Institute of Hygiene and Epidemiology in Warsaw,
- Laboratory of Dosimetric Measurements of the National Centre for Nuclear Research NCNR at Świerk,
- Laboratory of Radiometry of the Central Mining Institute in Katowice in the scope of control of doses from natural radioactive isotopes received by miners working underground.

The Atomic Law Act introduced an obligation to register doses and subject to personal dosimetry only those workers who are classified to category A of ionizing radiation exposure, that is those workers who, according to the head's opinion, may be in normal occupational conditions exposed to an effective dose exceeding 6 mSv per annum or to an equivalent dose exceeding in the period of 12 months the amount of 0.3 of suitable dose limits for skin, limbs and eyes' lenses.

The assessment of doses of category B workers, who are exposed to doses from 1 to 6 mSv is performed on the basis of measurements carried out in the work environment. If the head of organizational entity considers it necessary, workers of this category may (but are not obliged to) be included in the exposure control by means of personal dosimeters.

It is acceptable for people working in the conditions of exposure to ionizing radiation to exceed the limit of 20 mSv (but not more than 50 mSv) per annum provided that the dose of 100 mSv is not exceeded in the five year period. Therefore it is necessary to check a sum of doses received in a current year and previous 4 calendar years while supervising the process of exposure of workers who work with ionizing radiation sources. It means that the heads of organizational entities must maintain the registry of doses of exposed workers. Detailed information concerning records, reporting and registration of individual doses is contained in the Regulation of the Council of Ministers of 23 March 2007 on requirements concerning registration of individual doses (Journal of Laws of 2007, No 131, Item 913). Pursuant to this regulation, heads of organizational entities are obliged to send data concerning exposure of category A workers who report to them to the central registry of individual doses kept by the PAA President.

The population of workers who have got contact at work with ionizing radiation sources amounts in Poland to a few thousand people. However, only a small part of them performs a routine work in the conditions of actual exposure to ionizing radiation. The control of individual doses in Poland (according to data presented by the aforesaid authorized laboratories) in 2013 covered 50,000 individuals. For 95% of individuals included in the group analyzed here, the dose control is performed in order to confirm that the application of ionizing radiation sources is not hazardous and should not cause any health detriment. Workers of this group are included in category B of exposure to ionizing radiation. Medical staff working at diagnostic X-ray laboratories (approx. 30,000 people working in about 4,000 diagnostic centres which have got X-ray laboratories) constitutes the biggest group in category B.

Almost 2,500 individuals who must be included in the personal dosimetry of external exposure or/and assessment of internal doses (committed doses from radioactive substances which under working conditions could penetrate the body as a result of an intake) are classified annually to category A of exposure to ionizing radiation.

Data concerning doses of employees classified to category A by the heads of entities is collected in the central registry of doses of the PAA President. Workers in this category of exposure to ionizing radiation are obliged to undergo measurements of effective doses to the whole body and/or to a particular, most exposed body parts (for example hands). Exceptionally, in cases of exposure to contamination by diffusible radioactive substances called open sources, the assessment of committed dose from internal contaminations is performed.

From the beginning of the central registry of doses that is from 2002 till the end of April 2014 the total number of 4,900 people, including 2,242 workers was reported. This number includes workers whose data has been updated in 4 recent years.

In 2013, 1,364 workers classified to category A received effective doses not exceeding 6 mSv on annual basis (lower limit for exposure adopted for category A workers), and doses exceeding 6 mSv were received by 62 individuals, out of whom only 2 cases were found to have exceeded an annual dose of 20 mSv, that is a dose limit which may be received during a calendar year as a result of routine work with ionizing radiation. In all the above cases of exceeding dose limits, working conditions and the causes for the exposure to radiation were analysed in a great detail.

The data summary for 2013 concerning exposure to ionizing radiation of workers classified in A category, who were entered in the central registry of doses by particular organizational entities, is shown in Table 9.

Until 2002 annual data summaries concerning individual exposure (according to professional groups, trades and types of enterprises) were based on data directly from laboratories conducting dosimeter measurements and assessment of doses. They related to workers included in the exposure control program without classification categories: A or B. This classification was introduced at the beginning of 2002. Data concerning doses received by people working in the conditions of exposure to ionizing radiation is currently collected in the PAA President's central register of doses which has been kept since the beginning of 2003. This information refers solely to workers classified by a head to category A and is filed directly by organizational entities whose heads are obliged to submit, by 15 April of each year, notification cards containing data for the previous calendar year. Cards submitted contain the assessment, performed by authorized laboratories, concerning effective doses received by workers.

Table 9. Individual annual effective doses of individuals classified to category A with regard to exposure to ionizing radiation in 2013

Annual effective dose received [mSv]	Number of workers*
< 6	1 302
6 ÷ 15	52
15 ÷ 20	8
20 ÷ 50	2
> 50.0	0

* According to notifications to central registry of doses submitted till 30 April 2014

This data shows that in the group of category A workers, a percentage of individuals who did not exceed a lower limit specified for this exposure category, that is 6 mSv per annum, in 2013 amounted to 95.5% and the percentage of individuals who did not exceed the limit of 20 mSv/per annum – 99.8%. Thus only approx. 4.5%

of individuals exposed in their occupational activities, who had been classified into category A, received doses specified for workers of this exposure category to ionizing radiation category.

In 2013 the highest effective ionizing radiation dose was registered in case of the cardiac surgeon working with vascular angiography surgery. The other case of exceeding limit dose is a dose received by an employee of the Radioisotopes Centre POLATOM at the National Centre for Nuclear Research at Świerk. The Radioisotopes Centre POLATOM at the NCNR is a specialized plant which produces radioactive sources for industry and medicine. Its workers are permanently exposed to radioactive material, however doses received by these workers only in exceptional cases reach the maximum dose level permitted by the Act (20mSv/year). In 2013 there was only one case of exceeding the maximum dose and the dose received by an employee amounted to 22.2 mSv during twelve months.

All the cases of exceeding annual dose limit are subject to a thorough investigation carried out by the Nuclear Regulatory Inspectors.

2.2. Control of exposure to natural ionizing radiation sources in mining

Contrary to radiation hazards resulting from artificial radioactive isotopes and devices emitting radiation, radiation hazards in mining (coal mining and extraction of other natural raw materials) are mainly caused by the increased level of ionizing radiation in mines, which is the effect of natural radioactivity. The sources of these hazards include:

- radon and products of its decay in the mine air (basic source of hazards),
- gamma radiation emitted by natural radioactive isotopes (mainly radium) contained in orogen rocks,
- mine waters (and sediments generated by these waters) with the increased content of radium isotopes.

First two factors stated above concern practically all miners working underground, whereas radiation hazards resulting from mine waters and sediments occur in special circumstances and concern a limited number of workers.

According to the Higher Mining Office, the number of workers employed underground amounted to 106,097 miners (data as of 31.12.2013).

As for radiation hazards, apart from secondary legislation of the Atomic Law Act there were also executive regulations to the Act of Parliament on Geological and Mining Law Act which applied in 2013:

1. Regulation of Minister of Economy of 28 June 2002 on occupational safety and hygiene, movement and special fire safeguards in underground mining facilities (Journal of Laws, No 139 of 2002, Item 1169 with later amendments) regulating principles of supervision over protection against radiation hazards of natural radioactive substances and the method of the performance of measurements and assessment of radiation hazards in the underground mining plant,
2. Regulation of Minister of Interior and Administration of 14 June 2002 on natural hazards in mining facilities (Journal of Laws No 94 of 2003, Item 841 with later amendments) distinguishing the following excavations:
   - class A excavations, situated in controlled area within the meaning of provisions of the Atomic Law, where the occupational environment creates potential exposure of a worker to an annual effective dose exceeding 6 mSv,
   - class B excavations, situated in supervised area within the meaning of the provisions of Atomic Law, where the occupational environment creates potential exposure to an annual effective dose which is more than 1 mSv, but does not exceed 6 mSv.

The dose levels determined as above take into account value of natural background ‘on the surface’ (that is outside the occupational environment). It means that while performing calculations which are necessary to classify excavations into particular classes of radiation hazards, the dose value calculated on the basis of measurements must be reduced by the dose resulting from natural background ‘on the surface’ for a given working time. Table 10 shows amounts of working limits of hazard rates for both classes of excavations which create radiation hazards. The proposed amounts result from the prepared and implemented model for calculating committed doses caused by specific working conditions in underground mining facilities. It is necessary to consider here the following aspects:

- potential alpha energy concentration of short-lived products of radon decay in mine excavation air,
- gamma radiation dose rate occurring at a given work post in mine excavation,
- radium concentration in mine waters,

- radium concentration in sediments precipitated from mine waters.

Table 10. Amounts of working limits of hazard rates for particular classes of excavations which create radiation hazards (Central Mining Institute)

Hazard rate	Class A *	Class B *
potential alpha energy concentration of short-lived products of radon decay ($C\alpha$), $\mu J/m^3$	$C\alpha > 2.5$	$0.5 < C\alpha \leq 2.5$
gamma radiation kerma rate (K), $\mu Gy/h$	$K > 2.5$	$0.5 < K \leq 2.5$
proper activity of radium isotopes in sediment (C_{RaO}), kBq/kg	$C_{RaO} > 120$	$20^{**} < C_{RaO} \leq 120$

* Given amounts correspond to doses of 1 mSv and 6 mSv, provided that the effects from particular hazard sources are not summed up and the annual working time is 1,800 hours.
** If the specific activity exceeds the amount of 20 kBq/kg, it is absolutely necessary to estimate effective committed dose for people working in this place.

The assessment of miners' exposure to natural radiation sources (based on measurements in the occupational environment) is performed by the Central Mining Institute in Katowice.

Work organization methods which prevent exceeding 20 mSv dose limit were introduced in underground mining facilities and in excavations with radiological hazards (where workers are likely to receive an annual effective dose exceeding 1 mSv).

Table 11 presents a number of mines where (on the basis of confirmed exceeded amounts of particular radiation hazard factors) there may occur excavations classified to A and B radiation hazard class. It must be pointed out that excavations with radiological hazards are classified by the heads of suitable mining facilities on the basis of a sum of effective doses for all radiation hazard factors in the real working time.

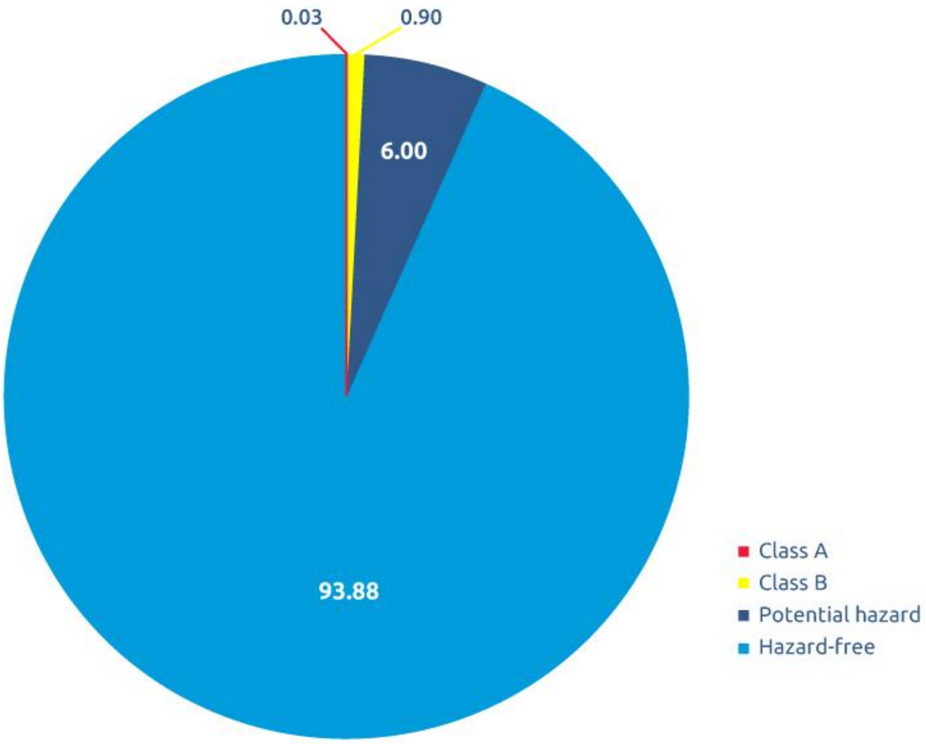
Therefore the number of excavations included into particular radiation hazard categories is actually lower. Information on the number of mine excavations, which are really included into particular radiation hazard classes, is not submitted to the Central Mining Institute.

Furthermore, a percentage share was estimated concerning individuals working in excavations belonging to particular hazard classes. The result of this estimation is shown in Figure 10.

Table 11. Number of hard coal mines including excavations with radiological hazards (Central Mining Institute)

Hazard class	Number of mines	Hazards from short-lived products of radon decay	Hazards from gamma radiation	Hazards from radioactive sediments	External gamma radiation (individual dosimetry)
A	1	-	1	-	1
B	9	5	5	4	3

Figure 10. Percentage share of hard coal miners working in excavations classified to particular radiation hazard classes. The employment level in coal mines as of 31.12.2013 amounted to 106,097 workers.



The analysis included the number of mines with radiologically hazardous excavations, type of excavation, hazard source and the number of the mining crew. On the basis of information collected by the High Mining Office, it was possible to determine the share of miners who work at excavations and are potentially exposed to radiation hazards.

It particularly refers to places where there may be waters and sediments with increased concentration of radium isotopes, increased concentrations of potential alpha energy and higher than average dose rates of gamma radiation.

Systematic control of radiation hazards, which has been conducted for more than twenty years, allows experts to claim that given the unfavourable conditions, radiation hazard may occur at almost every mine excavation.

The hazard assessment, which was performed by the Central Mining Institute in reference to hard coal mines, showed that there is only 1 mine with class A excavation (hazard refers to 0.03% of all working miners) and 9 mines with B class excavations (hazard refers to 0.9% of all working miners). In mine excavations with slightly increased natural radiation background (but below the level corresponding to class B) works 6% of the total number of miners employed, whereas more than 93.88% miners work at excavations where the radiation level is on the level of natural background 'on the surface'. The dose of 20 mSv is not reported to have been exceeded in any mines in the period of last 12 months. The said value is a dose limit for individuals whose professional activity is connected with exposure to radiation.

The Silesian Centre for Environmental Radioactivity of the Main Mining Institute possesses precise information regarding working time in particular excavations only in case of calculating committed effective doses. For other radiation hazard factors, the analysis of the extent of hazard was performed according to certain assumptions: nominal working time of 1800 hours and working time in water passageways as frequently stated – 750 hours. The estimates carried out on the basis of these values can vary significantly from the factual situation.

In 2013 the maximum additional annual effective dose connected with particular hazard sources amounted to:

- in relation to short-lived radon decay products E_{α} = 4.3 mSv (assuming that the annual working time is 1800 hours);
- in relation to environmental gamma radiation measurements E_{γ} = 3.5 mSv(assuming that the annual working time in water passageways is 750 hours);
- expressed as a committed effective dose E_{Ra} = 1.92 mSv for the absorption of radium isotopes into organism (in relation to the factual working time).

In accordance with the requirements of the Atomic Law Act concerning controlled and supervised areas, underground excavations classified to the category B (supervised area) should be classified again to the category A (controlled area) in the event when there is the possibility of contamination spread, for example during the performance of works connected with the removal of sludge or sewage.

The analysis of measurement results in the context of data collected from the recent 10 years showed that in underground mining facilities (with working times assumed for particular hazard factors) there are always excavations classified to radiation hazard category B which include positions where the dose exceeds 1 mSv.

Excavations which should be included in radiation hazard category A are those where the dose for miners could exceed 6 mSv and they are very rare and after establishing the hazard they could be resigned. During last 10 years it has happened only once that the maximum dose from a single hazard factor exceeded the dose limit i.e. 20mSv.

In 2013 the main reason of the occurrence of increased effective doses for miners was the exposure to external gamma radiation and short-lived products of radon decay.

IX. 3. GRANTING PERSONAL AUTHORIZATIONS ON NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION

Only those individuals holding special national authorizations granted by the PAA President are employed in particular positions in nuclear facilities and in other entities involving exposure to ionizing radiation (Article 7, Section 3 and 10 and Article 12, Section 1 of the Atomic Law Act of 29 November 2000 and the Regulation of the Council of Ministers of 10 August 2012 on positions important for ensuring nuclear safety and radiological protection and radiation protection officers (Journal of Laws, Item 1022).This regulations has been enforceable since 29 September 2012. It superseded the Regulation of the Council of Ministers with the same title of 18 January 2005 (Journal of Laws No 21, Item 173).

Pursuant to Article 7, Section 6 and Article 12, Section 2 of the Act, the authorizations may only be obtained upon the completion of training on radiological protection and nuclear safety in the scope required for the specific type of authorizations and upon the passing of examination before the PAA President’s examination board. The information about entities which offered such training in 2013 is shown in Table 12.

Table 12. Entities which in 2013 conducted nuclear safety and radiological protection safety training

License type	Name of entity	Number of trainings conducted	Number of trainees	Number of licenses granted*
Radiation protection officer	Central Laboratory for Radiological Protection in Warsaw	2	39	193
	Polish Federation of Engineering Association in Katowice	2	19	
	Nuclear Regulatory Inspectors Association in Poznań	2	29	
	National Defence Academy in Warsaw	-	-	
	Faculty of Physics of the Warsaw University	2	71	
Accelerator operator	Faculty of Physics of the Warsaw University	5	67	395
	Radiological Safety Inspectors Association in Poznań	10	233	
	National Centre for Nuclear Research	2	20	
	Oncology Centre Division in Cracow	1	35	
	Oncology Centre Division in Gliwice	2	60	

* including individuals who participated in training before 2011 or were entitled to take examination without an obligation to attend training

The required trainings were performed by organizational entities authorized to conduct such activities by the PAA President. They employed suitable staff of instructors and used necessary technical equipment which allows to conduct practical classes in accordance with the course syllabus, as elaborated for each entity, in line with a type of training approved by the PAA President.

In 2013 there were two examination boards which were appointed on the basis of provisions of Article 71 Section 1 and Article 12a Section 6 of the Atomic Law Act:

- examination board competent for granting licenses of radiation protection officer (RPO),
- examination board competent for granting licenses which allow to be employed in the positions important for ensuring nuclear safety and radiological protection.

In 2013, a total number of 573 participants attended professional trainings. Having passed the examination and having fulfilled all the remaining conditions required to obtain necessary authorizations, 193 candidates were granted authorizations of radiation protection officer and 395 candidates received licenses to be employed in the positions important for ensuring nuclear safety and radiological protection, including:

- 278 persons – authorizations of accelerator operator which is used for medical purposes and for teleradiotherapy devices and/or devices applied in brachytherapy with radioactive sources,
- 117 persons – authorizations of accelerator operator applied for other than medical purposes.

Moreover, having passed the examination before the PAA President’s Examination Board, 8 candidates were granted extension of authorizations to be employed in the positions important for ensuring nuclear safety and radiological protection, including:

- 4 persons – operator of research reactor,
- 2 persons – dosimetrist of research reactor,

- 1 person – specialist for nuclear material accountancy,
- 1 person – manager of research reactor,

In 2013 the total number of 596 persons received authorizations of radiation protection officer and authorizations to be employed in positions important from nuclear safety and radiological protection point of view (including 6 persons connected with the operation of MARIA reactor).

NATIONAL
ATOMIC ENERGY
AGENCY

X. NATIONAL RADIOLOGICAL MONITORING

X. 1. NATIONWIDE MONITORING
1.1. Early warning stations for radioactive contamination
1.2. Units conducting measurements of radioactive contamination of the environment and foodstuffs

X. 2. LOCAL MONITORING
2.1. Nuclear Centre at Świerk
2.2. The National Radioactive Waste Repository at Różan
2.3. Areas of former uranium ore plants

X. 3. PARTICIPATION IN INTERNATIONAL EXCHANGE OF RADIOLOGICAL MONITORING DATA
3.1. The European Union exchange of measurement data system based on routine radiological monitoring of the environment in the EU Member States
3.2. Exchange of data from early warning stations in EURDEP system within the EU's framework
3.3. Exchange of data from early warning stations in the Council of Baltic Sea States' system

X. 4. RADIATION EMERGENCIES
4.1. Emergency procedures
4.2. Radiation emergency outside Poland
4.3. Radiation emergency in Poland

National radiological monitoring consists in systematic measurements of gamma radiation dose rate in given points within the territory of Poland and the performance of measurements of radioactive isotopes in main components of the environment and foodstuffs. Depending on the scope of tasks, it is possible to distinguish two system types:

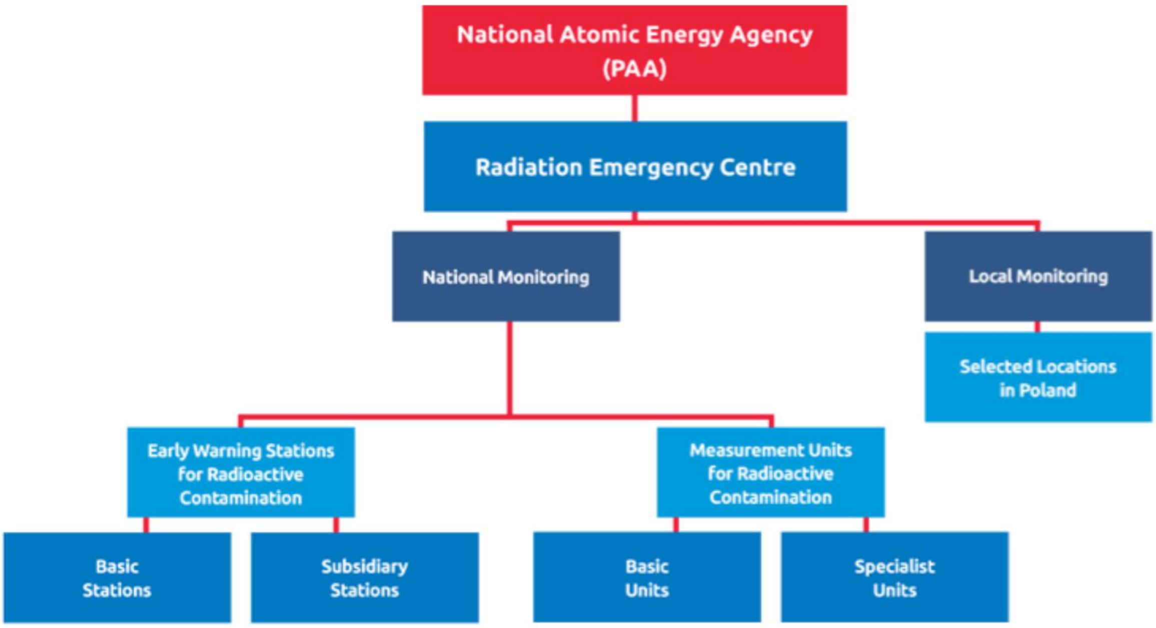
- **nationwide monitoring** allowing to obtain data necessary to assess radiological situation of the whole territory of Poland in normal conditions and in radiation emergency, and to examine long-distance changes of the environment and foodstuffs radioactivity,
- **local monitoring** allowing to obtain data from areas where there are (or were) conducted activities which may cause local increase of radiation exposure of the population living there (it refers to nuclear centre at Świerk, radioactive waste repository at Różan and areas of former uranium ore plants in Kowary).

Nationwide and local monitoring measurements are conducted by:

- **measurement stations**, which constitute an early warning network for radioactive contamination,
- **measurement units**, which conduct measurements of radioactive contamination relating to the environmental materials and foodstuffs,
- **services of entities operating nuclear facilities and nuclear regulator** – in case of local monitoring.

In 2013, as in the previous years, the PAA Radiation Emergency Centre (CEZAR) performed tasks on behalf of the President of National Atomic Energy Agency (PAA) concerning the coordination of the radiological monitoring system comprising stations and units conducting suitable measurement.
General scheme representing this system is shown in Figure 11.

Figure 11. Radiological monitoring system in Poland



Radiological monitoring results are the basis for the national radiological assessment made by the PAA President, which is announced everyday at 11:00 am at the PAA Internet website (gamma radiation dose rate) and cumulatively in quarterly releases published in the Polish Monitor (gamma radiation dose rate and content of Cs-137 isotope in air and milk) and in annual reports (the complete use of measurement results). This procedure is performed under normal circumstances, when there is no potential radiation hazard, and in the event of emergency, the frequency of communication releases is agreed individually. The information given constitutes the basis for the assessment of radiation hazards for humans and intervention measures, if necessary.

X. 1. NATIONWIDE MONITORING

1.1. Early warning stations for radioactive contamination

The task of these stations is to provide information necessary to prepare updated assessment of radiological situation in Poland and to provide early detection of radioactive contamination in the event of radiation emergency. This system consists of so-called basic and subsidiary stations (Figure 12).

Basic stations:
13 automatic Permanent Monitoring Stations (PMS) owned by the PAA and operating within the international framework of the EU and Baltic states (the Council of Baltic Sea States) network which perform permanent monitoring of:

- ambient gamma dose rate,
- intensity of atmospheric fallout and local temperature.

12 ASS-500 stations, owned by the Central Laboratory for Radiological Protection (11) and the PAA (1), which continuously collect atmospheric aerosols on the filter and perform spectrometric identification of particular radioisotopes in a weekly sample; the stations also conduct continuous measurement of activity of atmospheric aerosols collected on the filter which allows immediate detection of significant increase of Cs-137 and I-131 isotope concentration in air.

9 stations of the Institute of Meteorology and Water Management (IMWM) which perform:

- continuous monitoring of ambient gamma dose rate,
- continuous monitoring of total and artificial alpha and beta activity of atmospheric aerosols (7 stations),
- monitoring of total beta activity in 24-hour and monthly samples of the total fallout.

Additionally, once a month an indication of the content of Cs-137 (spectrometric method) and Sr-90 (radiochemical method) is performed in cumulative monthly samples of the total fallout from all 9 stations.

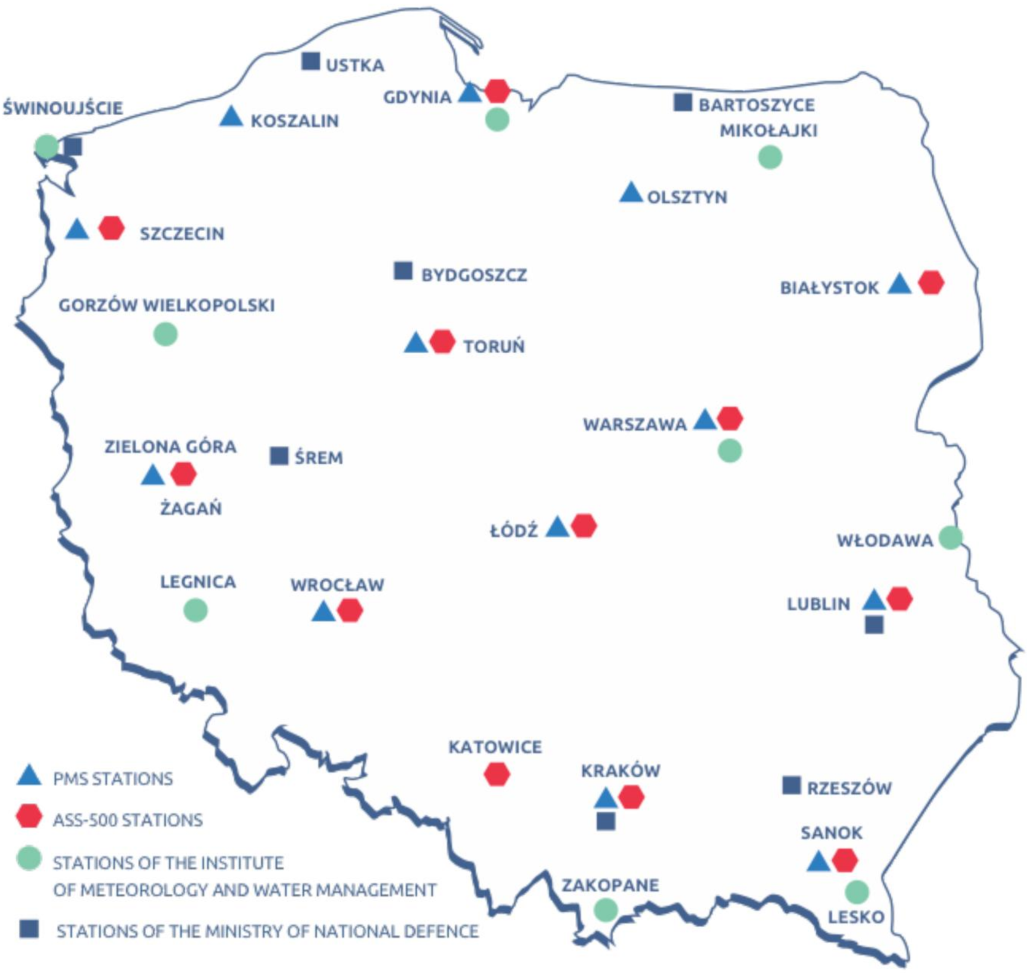
Early warning station for
radioactive contamination PMS

Subsidiary stations:

- 8 monitoring stations of the Ministry of National Defence, which perform continuous monitoring of ambient gamma dose rate, which is registered automatically in the Centre of Contamination Analysis.

In the past there were 13 stations operating within the scheme of the Ministry of National Defence. However due to unsatisfactory technical condition, 5 stations were shut down. At present the Ministry of National Defence is working to introduce monitoring stations of a new generation.

Figure 12. Location of early warning stations for radioactive contamination



1.2. Units conducting measurements of radioactive contamination of the environment and foodstuffs

This is a network of units monitoring, by means of laboratory methods, the content of radioactive contamination in the samples of environmental materials, in foodstuffs and animal feed. The network consists of:

- basic units operating at Sanitary-Epidemiological Stations and conducting measurements of total beta activity in milk samples (on a monthly basis) and foodstuffs (on a quarterly basis) and the content of particular radionuclides (Cs-137, Sr-90) in selected foodstuffs (on average twice a year),
- specialist units, conducting more extended analyses concerning radioactivity of environmental samples.

Location of basic monitoring units is shown in Figure 13.

Till the end of 2002 there were 48 basic units in accordance with the Appendix No 2 to the Regulation of the Council of Ministers of 17 December 2002 on the station for early detection of radioactive contamination and on the units conducting measurements of radioactive contamination (Journal of Laws, No 239, Item 2030). Owing to the reorganization of the system of National Sanitary Inspection in 2003 and further changes in the following years, the number of units decreased to 33 (factual state as of the end of 2013).

Figure 13. Location of basic units monitoring radioactive contamination in Poland

In 2013 measurement results (see chapter XI.2 'National radiological assessment' – 'Radioactivity of basic foodstuffs') were submitted to the PAA Radiation Emergency Centre by 31 units. Certain units did not submit measurement results but they took part in the comparative measurements organized by the PAA President.

X. 2. LOCAL MONITORING

2.1. Nuclear Centre at Świerk

Radiological monitoring in the area and in the surroundings of Świerk nuclear centre was conducted in 2013 by the Laboratory of Dosimetric Measurements of the National Centre for Nuclear Research (former Institute of Atomic Energy POLATOM), and additionally in the close surroundings of the Centre – by the Central Laboratory for Radiological Protection in Warsaw, as commissioned by the PAA President. The monitoring was performed in the following manner:

- in the area and in the surroundings of the centre cocentrations of the following isotopes were measured:
    - selected natural and artificial isotopes (Cs-137, I-131) in atmospheric aerosols,
    - beta and gamma isotopes in atmospheric fallout,
    - beta and gamma isotopes in well waters,
    - beta isotopes in water from water-supply system,
    - beta isotopes in waters of the Świder river,
    - beta and gamma isotopes (including the content of H-3 and Sr-90) and alpha isotopes in drainage-fallout waters,
    - H-3 in underground waters,
    - Sr-90 and gamma isotopes in sludge from the centre's sewage pumping station,
    - gamma and beta isotopes (including the content of Sr-90) in sanitary sewage
    - gamma isotopes in the soil, grass and cereals and in milk collected from a nearby farm.

Measurements of gamma radiation were also made in order to indicate annual gamma radiation doses for selected locations in the area and surroundings of the centre with the use of thermoluminescent dosemeters,

- additionally in the surroundings of the Centre (measurements ordered by the PAA President) – indication of the content of Cs-137 and Cs-134 and H-3 isotopes in waters from the nearby Świder river, Cs-137 and Cs-134 and H-3 in waters from sewage treatment plant situated nearby in the city of Otwock, Cs-137 and Cs-134, H-3 and Sr-90 isotopes in well waters, artificial (mainly Cs-137) and natural radioactive isotopes in the soil and grass; the measurement of gamma dose rate was also carried out in five selected locations.

2.2. The National Radioactive Waste Repository at Różan

Radiological monitoring within the area and in the surroundings of the National Radioactive Waste Repository (NRWR) at Różan was conducted in 2013 by the Radioactive Waste Management Plant, and in the close surroundings of the repository, by the Central Laboratory for Radiological Protection by the order of the PAA President. The monitoring was performed in the following manner:

- in the area of NRWR – where measurements included:
  - radioactive gamma isotopes in atmospheric aerosols,
  - radioactive beta isotopes (including H-3) in waters from water-supply system and groundwaters (piezometers),
  - radioactive beta and gamma isotopes in the soil and grass,
  - measurements of gamma radiation in order to determine annual gamma radiation doses for permanent check points with thermoluminescent dosemeters (TLD).
- in the surroundings of NRWR – where measurements included:
  - the content of Cs-137, Cs-134 and H-3 in spring waters,
  - radioactive beta isotopes including H-3 in ground waters (piezometers),
  - artificial (mainly Cs-137) and natural radioactive isotopes in the soil, grass and cereals,
  - artificial (mainly Cs-137) and natural radioactive isotopes in atmospheric aerosols (measurements were carried out twice).

The gamma radiation dose rate was also measured in five permanent check points.

The most important measurement results representing the radiological situation in the area and the surroundings of the nuclear centre at Świerk and the National Radioactive Waste Repository at Różan are presented in chapter XI 'Assessment of national radiation situation'.

Having compared the data from 2013 and from the previous years, a conclusion can be drawn that the operation of the nuclear centre at Świerk and the National Radioactive Waste Repository at Różan does not affect the natural environment and the radioactivity of sewage and drainage-fallout waters removed from the area of the nuclear centre at Świerk was much lower in 2013 than values specified in applicable limits.

2.3. Areas of former uranium ore plants

The PAA post in Jelenia Góra (the Office for Handling Claims of Former Workers of Uranium Ore Plants) has been conducting radiological monitoring of the environment of the former uranium ore mines areas since 1998. The following measurements were made in 2013 within the framework of 'Radiological monitoring of areas degraded due to uranium ores mining and processing':

- measurements of the content of alpha and beta radioactive substances (measurement of alpha and beta activity) in drinking water (from public water supply system) in the area of the Association of Karkonoskie Counties, in the city of Jelenia Góra and in surface and underground waters (outflow from underground excavations),
- measurement of radon concentration in water from public water supply system, in water supplied to housing premises and in surface and underground waters (outflow from underground excavations),

The measurement results are discussed in chapter XI.3. 'Assessment of national radiation situation' – The natural radioactivity in the environment due to human activities'.

X. 3. PARTICIPATION IN THE INTERNATIONAL EXCHANGE OF RADIOLOGICAL MONITORING DATA

3.1. The European Union's exchange of measurement data system based on routine radiological monitoring of the environment in the EU Member States

The system includes data concerning dose rate, air contamination, contamination of drinking water, surface waters, milk and food (diet). The data is submitted by the PAA Radiation Emergency Centre to the Joint Research Centre in the city of Ispra in Italy on an annual basis (by 30th of June each year data for the previous year must be transmitted).

3.2. Exchange of data from early warning stations in EURDEP system within the EU's framework.

The European Radiological Data Exchange Platform (EURDEP) in 2013 included the exchange of the following data from the early warning stations for radioactive contaminations:

- gamma radiation dose rate (Permanent Monitoring Stations and stations of the Institute of Meteorology andWater Management),
- complete beta and alpha activity from artificial radionuclides in atmospheric aerosols (stations of the Institute of Meteorology and Water Management),

The EURDEP system operates continuously but:

- under normal circumstances data update is provided at least once every 24-hours,
- in emergency, data update should be provided at least once every 2 hours,
- transmitting data to the EURDEP central base should be carried out automatically while the switch from normal to emergency mode of operations is ensured (suitable instructions).

Poland provides its measurement results once every hour, regardless of the mode of operation.

3.3. Exchange of data from early warning stations in the Council of Baltic Sea States' system

The scope and format of data exchange which is maintained within the framework of the Council of Baltic Sea States (CBSS) i.e. within the framework of regional exchange is identical to the EURDEP system operating in the European Union.

The frequency of data updates under normal circumstances may be different in different countries and depends on the frequency of data collection in particular countries.

In emergency, it is recommended to provide data updates every 2 hours.

X. 4. RADIATION EMERGENCIES

4.1. Emergency procedures

Pursuant to the terms and definitions used in the Atomic Law Act, radiation emergency is a hazardous situation which requires urgent actions for the protection of workers or the general public. In case of radiation emergency (radiation event), intervention measures are taken as scheduled separately for emergency events occurring within the area of organizational entity (on-site emergency) and for those whose results go beyond organizational entity ('regional' and 'national' emergency, including trans-border results).

A head of a given entity, regional governor or minister competent for interior are in charge of elimination of the hazard and of consequences of the event depending on the scale of emergency.

Radiation Emergency Centre (CEZAR) performs the informative and consulting role in assessing the level of doses and contamination and other measures which are required on the emergency site. Furthermore, the President transmits to the community, which has become exposed as a result of emergency event, and also to the international organizations and neighbouring states, the information about radiation hazards. The same procedure applies in case of an incident of illegal trade in radioactive substances (including attempt at illegal shipment across the national border). The PAA CEZAR possesses at its disposal a dosimetric team which may perform measurements of radioactive dose rate and contamination on the site and may identify type of contamination and abandoned radioactive substances. It may also remove contamination and ship radioactive waste from the emergency site to the Radioactive Waste Management Plant.

CEZAR performs a number of functions: emergency service of the PAA President[7], the function of National Contact Point (NCP) for the International Atomic Energy Agency (USIE system – Unified System for Information Exchange in Incidents and Emergencies), for the European Commission (ECURIE system – European Community Urgent Radiological Information Exchange), for the Council of Baltic Sea States, NATO and states bound with Poland by virtue of bilateral agreements on early notification in case of radiation emergency. It is on duty for 7 days a week and 24 hours a day. The Centre prepares regular national radiological assessment and in the event of radiation emergency uses the decision support systems (RODOS and ARGOS).

[7]Jointly with the Radioactive Waste Management Plant (on the basis of agreement concluded between the PAA President and the Radioactive Waste Management Plant)

4.2. Radiation emergency outside Poland

In 2013 the National Contact Point did not receive any information about accidents in nuclear facilities or about incidents on the site of nuclear installations would be classified above level 3 in the seven degree international scale INES.

However about 39 notifications were collected with regard to minor incidents (level from 0 to 3 in the seven degree international scale INES) which concerned mainly unplanned exposure of workers to ionizing radiation during the use of radioactive sources, incidents on the site of nuclear power plants or related to ionizing radiation sources.

Moreover, the National Contact Point through the USIE and ECURIE system received several organizational and technical notifications regarding international exercises.

It must be emphasized that incidents or events which had taken place outside national borders, as reported in 2013, caused no hazards to the humans and the environment in Poland.

4.3. Radiation emergency in Poland

In 2013 the Radiation Emergency Centre's officers on duty received 59 notification of radiation emergency within the territory of Poland (see Table 13). Fulfilling their tasks, the dosimetric team of the PAA President was deployed in 17 cases to the emergency site in order to perform radiometric measurements and/or collection of materials which had been classified as radioactive waste (see Table 14).

Table 13. Notifications on radiation emergency in 2013

Notifications were with regard to:	
presence of radioactive substances in "scrap metal"	30
activation of radiation portal monitor at the border crossing	14
presence of radioactive substances in industrial and municipal waste	10
incidents occurred during works with radioactive sources	2
finding radioactive source in a public place	2
loss of radioactive source	1
IN TOTAL	**59**

Table 14. Emergency call-out of dosimetric team of the PAA President in 2013

Emergency call-outs of dosimetric team concerned:	
activation of radiation portal monitor at the border crossing	14
finding a radioactive source in a public place	2
presence of radioactive substances in "scrap metal"	1
IN TOTAL	**17**

What is more, emergency service of the PAA President also participated in exercise conducted at the site of Airport Warsaw Okęcie and Bielański Hospital in Warsaw.

It must be underlined that no radiation emergency, which had been reported in the territory of Poland in 2013, caused any hazards to the humans and the environment.

Moreover, the CEZAR officers on duty during the reporting period of 2013 provided consulting service in 6 328 cases (which were not connected with elimination of the hazard and of consequences of the radiation emergency event). Most of them (6 197) were addressed to the Border Control Units owing to the detection of an increased level of radiation.

The consultations concerned, among other things: transit carriage or importation to Poland, for domestic recipients, minerals, feeds, charcoal, refractory bricks, propane-butane, electronic and mechanical components, chemicals, radioactive sources (in total 5407 cases), as well as crossing the border by patients treated with radiopharmaceuticals (790 cases). Additionally, emergency service of the PAA President performing their duties provided consulting and advisory services in 131 cases to other state authorities and private persons.

NATIONAL ATOMIC ENERGY AGENCY

XI. ASSESSMENT OF NATIONAL RADIATION SITUATION

XI. 1. RADIOACTIVITY IN THE ENVIRONMENT
1.1. Ambient gamma dose rate
1.2. Atmospheric aerosols
1.3. Total fallout
1.4. Waters and bottom sediments
1.5. Soil

XI. 2. RADIOACTIVITY OF BASIC FOODSTUFFS
2.1. Milk
2.2. Meat, poultry, fish and eggs
2.3. Vegetables, fruits, cereals and mushrooms

XI. 3. RADIOACTIVITY OF NATURAL RADIONUCLIDES IN THE ENVIRONMENT INCREASED DUE TO HUMAN ACTIVITIES

Pursuant to Article 72 of the Atomic Law Act, the President of National Atomic Energy Agency (PAA) performs a systematic assessment of the national radiation situation.

The basis for this evaluation are, first of all, the measurement results from early warning stations for radioactive contamination and units monitoring radioactive contamination of foodstuffs, drinking water, surface water and raw feeds (see chapter X 'National radiological monitoring'). The said assessments are presented in:

- quarterly releases of the PAA President, which are published in Polish Monitor, concerning national radiation situation and containing data on radiation level, air radioactive contamination and content of Cs-137 radionuclide in milk,
- annual reports entitled 'Activities of the PAA President and assessment of nuclear safety and radiological protection in Poland'.

Moreover, on the basis of data obtained from early warning stations for radioactive contamination, which operate continuously without interruptions, the PAA's website displays, on daily basis, a map illustrating the 24-hour distribution of gamma radiation dose rate within the territory of the whole country.

Assessments shown in this publication include also measurement results (with regard to soil, surface waters and bottom sediments) carried out by the Central Laboratory for Radiological Protection as commissioned by the Chief Inspectorate of the Environmental Protection.

XI. 1. RADIOACTIVITY IN THE ENVIRONMENT

1.1. Ambient gamma dose rate

The values of ambient gamma dose rate, including the cosmic radiation and radiation generated by radionuclides in the soil, as shown in Table 15, demonstrate that in Poland in 2013, the average 24-hour values oscillated between 51 to 143 nGy/h, with an annual average amount of 94 nGy/h.

The values of gamma radiation dose rate in the surroundings of nuclear centre at Świerk near Otwock were between 48.1 to 63.2 nGy/h (an average dose: 58.2 nGy/h), and in the surroundings of the National Radioactive Waste Repository at Różan – from 70.2 to 85.9 nGy/h (an average dose: 78.7 nGy/h). These values do not differ significantly from dose rate measurement results obtained in other regions of Poland.

Table 15. Dose rate values obtained from early warning stations for radioactive contamination in 2013 (PAA on the basis of data received from early warning stations for radioactive contamination)

Stations*	City (location)	Range of 24-hour average values [nGy/h]	Annual average value [nGy/h]
Permanent Monitoring Stations (PMS)	Białystok	84-116	94
	Gdynia	102-112	105
	Koszalin	83-100	90
	Kraków	107-126	114
	Łódź	81-96	87
	Lublin	79-116	98
	Olsztyn	87-111	96
	Sanok	100-133	114
	Szczecin	92-108	98

	Toruń	82-96	88
	Warszawa	85-100	89
	Wrocław	83-99	88
	Zielona Góra	85-101	90
Institute of Meteorology and Water Management (IMiGW)	Gdynia	77-95	82
	Gorzów	81-101	90.5
	Legnica	94-123	106
	Lesko	80-121	98
	Mikołajki	80-117	102
	Świnoujście	74-91	78
	Warszawa	64-92	75
	Włodawa	51-86	64
	Zakopane	89-143	114

* Symbols of stations defined in chapter X 'National radiological monitoring'

Measurement results show that the level of gamma radiation in Poland and in the surroundings of the nuclear centre at Świerk and the National Radioactive Waste Repository at Rózan in 2013 did not differ from the previous year level.

The differences in the dose rate values (even for the same city) result from the local geological conditions which affect the level of earth radiation.

1.2. Atmospheric aerosols

In 2013 the artificial radioactivity of aerosols in the ground-level atmosphere, estimated on the basis of measurements performed by early warning stations for radioactive contaminations (ASS-500), showed, similarly to the recent years, the presence of detectable amounts of Cs-137 radionuclides. Its average concentration in the period oscillated from below 0.04 to approx. 23.0 $\mu Bq/m^3$ (on average 1.0 $\mu Bq/m^3$). The average values of I-131 radionuclide concentration in the period oscillated in the range from below 0.1 to approx. 2.4 $\mu Bq/m^3$ (on average 0.6 $\mu Bq/m^3$), whereas the average values of natural Be-7 radionuclide concentration amounted to few millibecquerels per m^3.

Figures 15 and 16 show annual average concentration of Cs-137 in atmospheric aerosols in the years: 1998–2013, in the whole territory of Poland and in Warsaw respectively. The increased concentration of Cs-137 in 2002 was due to the fire of forests in the territory of Ukraine, which had been contaminated as a result of Chernobyl accident whereas, in 2011 it was the result of the movement of the masses of air over Poland containing this radionuclide, released during the accident at the Fukushima nuclear power plant. More information about this was published in the report: 'Activities of the President of National Atomic Energy Agency (PAA) and Assessment of Nuclear Safety and Radiological Protection in Poland in 2011'.

Figure 14. Annual average concentration of Cs-137 in aerosols in Poland in years 1997–2012 (number of stations measuring the content of this radionuclide is given in the brackets) (PAA on the basis of data provided by the Central Laboratory for Radiological Protection, as transmitted by early warning stations for radioactive contamination ASS-500)

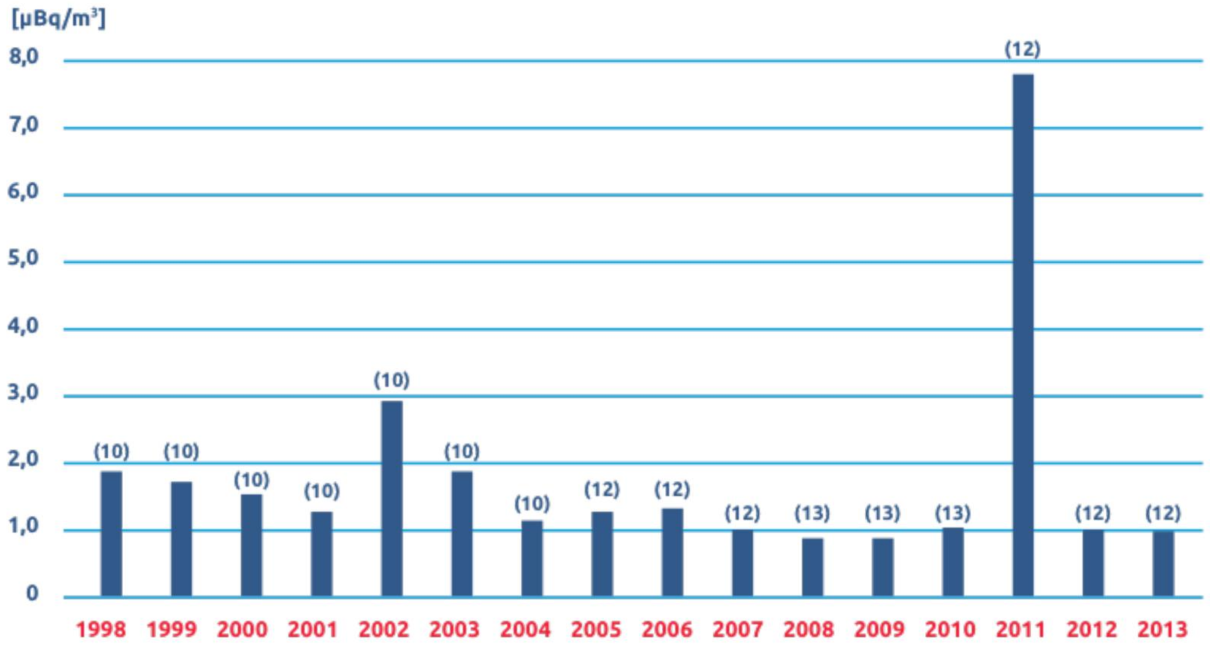
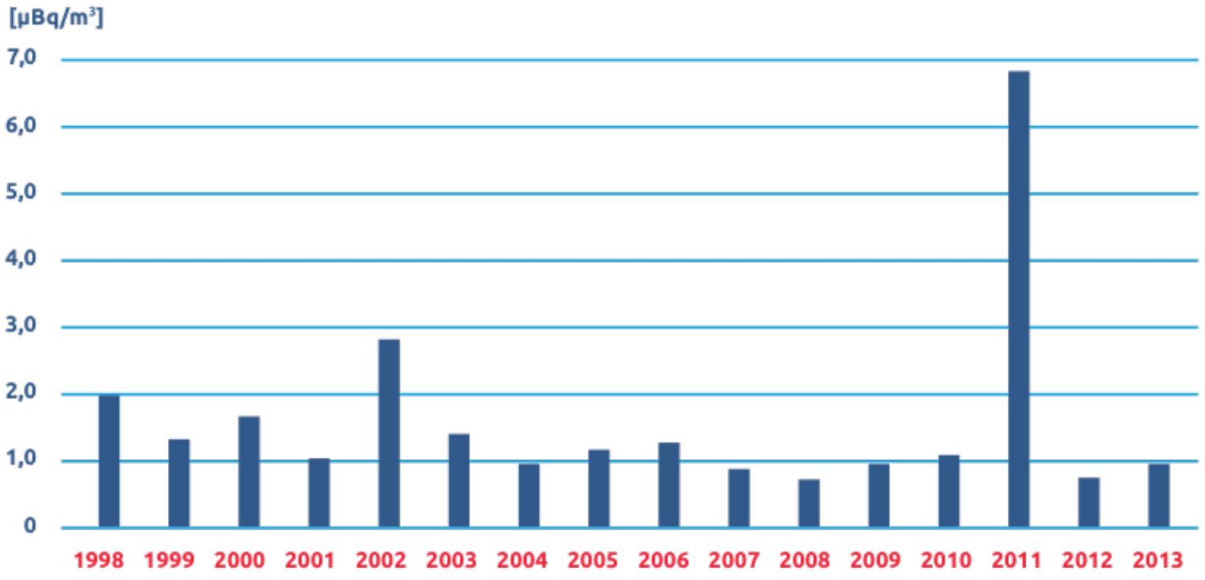


Figure 15. Annual average concentration of Cs-137 in aerosols in Warsaw in years 1998–2013 (PAA on the basis of data provided by the Central Laboratory for Radiological Protection, as transmitted by early warning stations for radioactive contamination: ASS-500)



The concentration of Cs-137 and I-131 isotopes in air in the surroundings of the National Radioactive Waste Repository at Różan, by means of mobile aerosol sampling station (for sampling carried out in summer and autumn of 2013) did not exceed detection limits amounting to respectively 5.0 µBq/m^3 for I-131 isotope and 3.5 µBq/m^3 for Cs-137 isotope.

The measurements of the concentration of the radioactive isotopes in the air were performed in 2013 on the site and in the vicinity of the National Center for Nuclear Research in Świerk on weekly basis. The concentration of I-131 in the air on the site of the Center in Świerk varied from the values below 0.25 µBq/m^3 to 44 µBq/m^3, and the concentration of Cs-137 ranged from below 0.25 µBq/m^3 to 2.2 µBq/m^3. In the vicinity of the Center the concentration of I-131 in the air was from below 0.32 to 14 µBq/m^3, and the concentration of Cs-137 varied from 0.36 to 2.3 µBq/m^3.

In stations that permanently perform the measurements of the total alpha and beta activity of atmospheric aerosols, allowing to detect the presence of artificial radionuclides with concentration above 1 Bq/m^3, no case of exceeding the said amount for 24-hour average concentration was recorded in 2013.

1.3. Total fallout

Total fallout refers to dusts contaminated with isotopes of radioactive elements which due to the gravity and atmospheric precipitation settle on the surface of the earth.

Table 16. Average activity of Cs-137 and Sr-90 and average beta activity in total annual fallout in Poland in years 1997–2013 (Chief Inspectorate of Environmental Protection, measurements by the Institute of Meteorology and Water Management)

Year	Activity [Bq/m^2]		Beta activity [kBq/m^2]
	Cs-137	Sr-90	
1997	1.5	<1.0	0.35
1998	1.0	<1.0	0.32
1999	0.7	<1.0	0.34
2000	0.7	<1.0	0.33
2001	0.6	<1.0	0.34
2002	0.8	<1.0	0.34
2003	0.8	<0.1	0.32
2004	0.7	0.1	0.34
2005	0.5	0.1	0.32
2006	0.6	0.1	0.31
2007	0.5	0.1	0.31
2008	0.5	0.1	0.30
2009	0.5	0.1	0.33
2010	0.4	0.1	0.33
2011	1.1	0.2	0.34
2012	0.3	0.1	0.32
2013	0.3	0.2	0.31

The measurement results shown in table 16 confirm that the content of artificial radionuclides Sr-90 and Cs-137 in total annual fallout in 2013 was on the level observed in the previous years. The increased level of activity of Cs-137 in the total fallout in 2011 was caused by the arrival over the territory of Poland in March, April and May 2011 of the masses of air from Fukushima nuclear power plant.
In 2013 the presence of Cs-134 radionuclide was not detected.

1.4. Waters and bottom sediments

Radioactivity of waters and bottom sediments was determined on the basis of identification of chosen artificial and natural radionuclides in samples taken in permanent sampling sites.

Open waters

In 2013 the content of Cs-137 caesium and Sr-90 strontium was measured. Measurement results (Table 17) show that the concentration of the said radionuclides was on the same level as in the previous year and they are similar to those observed in other European countries.

Table 17. Concentration of Cs-137 and Sr-90 radionuclides in river and lake waters in Poland in 2013. [mBq/dm^3] (Chief Inspectorate of Environmental Protection, measurements by the Central Laboratory for Radiological Protection)

	Cs-137		Sr-90*	
	Range	Average	Range	Average
Vistula, Bug and Narew	1.92-5.65	3.15	1.56-4.02	4.02
Odra and Warta	1.66-7.25	3.54	3.01-6.22	4.39
Lakes	1.06-5.88	3.13	1.35-8.36	3.40

* The activity of Sr-90 in radioactive contamination emitted during Chernobyl accident was significantly lower than the activity of Cs-137. The increased activity of Sr-90, as observed at present, in sediments is caused by its easier leaching out from the soil.

The concentration of Cs-134 and Cs-137 radioisotopes in open water samples, taken in 2013 from additional sampling sites located in the surroundings of the nuclear centre at Świerk amounted to:

- the Świder river: 1.23 mBq/dm^3 (above the centre) and 2.14 mBq/dm^3 (below the centre),
- waters from sewage treatment plant in Otwock discharged to the Vistula river: 9.87 mBq/dm^3,

The concentration of tritium in the samples of open water, taken in 2013 from additional check points located in the surroundings of the nuclear centre at Świerk amounted to:

- the Świder river: 0.7 Bq/dm^3 (above the centre) and 1.0 Bq/dm^3 (below the centre),
- waters from sewage treatment plant in Otwock discharged to the Vistula river: 0.5 mBq/dm^3,

Radioactivity of surface waters of the Southern area of the Baltic Sea was measured in 2013 for the following isotopes: Cs-137, Ra-226 and K-40 (measurements performed by the Central Laboratory for Radiological Protection). The average concentration of the mentioned isotopes of these three isotopes remained on the level of 34.2 mBq/dm^3 for Cs-137, 3.09 mBq/dm^3 for Ra-226 and 2588 mBq/dm^3 for potassium K-40, and did not differ from the results of previous year.

Well, spring and ground waters in the surroundings of the National Radioactive Waste Repository and nuclear centre at Świerk.

Nuclear Centre at Świerk

The average concentration of radioactive isotopes of caesium and strontium in well waters in farms located near the nuclear centre at Świerk in 2013 was respectively: 4.21 mBq/dm^3 for Cs-137 and 14.50 mBq/dm^3 for Sr-90. The concentration of tritium (H-3) was also measured and amounted on average to 0.9 Bq/ dm^3.

National Radioactive Waste Repository at Różan

The concentration of radioactive isotopes Cs-137 and Cs-134 in spring waters near the National Radioactive Waste Repository at Różan amounted on average to 3.6 Bq/dm^3.
The concentration of tritium (H-3) was also measured in 2013 around the National Radioactive Waste Repository at Różan and it amounted on average to 2.84 Bq/dm^3.

Concentration measurement results in 2013 did not differ from results in the previous years.

Bottom sediments

In 2013 – similarly to the previous year – the content of selected artificial and natural radionuclides in the samples of dry mass of bottom sediments in rivers, lakes and the Baltic Sea was measured. The measurement results were shown in Tables 18 and 19.

Table 18. Concentration of caesium and plutonium radionuclides in the bottom sediments of Polish rivers and lakes in 2013. [Bq/kg of dry mass] (Chief Inspectorate of Environmental Protection, measurements by the Central Laboratory for Radiological Protection)

	Cs-137		Pu-239, 240	
	Range	Average	Range	Average
Vistula, Bug and Narew	0.72-63.75	7.68	0.005-0.226	0.041
Odra and Warta	1.03-11.66	4.50	0.005-0.083	0.034
Lakes	1.17-29.03	6.83	0.006-0.193	0.040

Table 19. Concentration of artificial radionuclides: Cs-137 and Pu-238, Pu-239, Pu-240 and natural radionuclides: K-40 and Ra-226 in the bottom sediments of the Southern zone of the Baltic Sea in 2013 [Bq/kg of dry mass] (PAA on the basis of data provided by the Central Laboratory for Radiological Protection)

Layer thickness	Cs-137	Pu-238	Pu-239, 240	K-40	Ra-226
0-5 cm	136.59	0.05	1.38	843.30	30.15
5-19 cm	48.04	0.05	1.10	879.17	29.85

The above results show that in 2013 the concentration of artificial radionuclides in bottom sediments and waters of the Baltic Sea was on the same levels as measured in the previous years.

1.5. Soil

The concentration of both natural and artificial radionuclides in soil is determined basing upon cyclic measurements, made once every few years, of the content of radioactive isotopes in the samples of non-cultivated soil. The samples for measurements are taken from 10 cm and 25 cm thick soil layer.

Monitoring of radioactive isotopes in the soil is performed by the Central Laboratory for Radiological Protection as ordered by the Chief Inspectorate of Environmental Protection.

In 2012, 264 samples of soil were taken from 254 permanent sampling sites located within the territory of Poland, in 2013 spectrometric measurements of these samples were carried out and the concentration of artificial (Cs-137, Cs-134) and natural radioisotopes was measured.

Basing upon the performed measurements it is established that average deposition of Cs-137 in the surface layer of soil (10 cm) in Poland is on the level exceeding 1 kBq/m^2 and amounts on average to 1.54 kBq/m^2 (data from measurement of samples collected in autumn of 2012.)

The average deposition of Cs-137 in Poland in the period of radioactive contamination monitoring of soil decreased from 4.64 kBq/m^2 in 1988 to 1.54 kBq/m^2 in 2012. The concentration of Cs-134 in the soil samples was changing during the monitoring period in accordance with its half-life period and, at present, this isotope does not appear in detectable amounts in the soils of Poland.

Results of spectrometric measurements indicate that the deposition of Cs-137 radioisotope in particular samples taken from 10cm-thick soil layer in 2012 ranged from 0.22 to 17.97 kBq/m^2 and more than 70% of results did not exceed the value of 1.5 kBq/m^2 (on average 1.54 kBq/m^2). However the concentration of this isotope in the soil amounts from 1.4 to 188.1 Bq/kg with the average concentration amounting to 16.3 Bq/kg. The highest levels – registered in the South of Poland – are caused by intensive local rainfall which occurred in those territories at the time of Chernobyl accident.

The average concentration of natural radionuclides in Poland in 2012 amounted to: 24.8 Bq/kg for Ra-226 (natural uranium-radium series), 23.8 Bq/kg for Ac-228 (natural torium series) and 415 Bq/kg for K-40 (potassium isotope occurring naturally).

The average deposition of Cs-137 isotope in particular regions of Poland is shown in Table 20 and the average regional concentration of natural radioactive isotopes in the soil in 2012 is shown in Table 21.

Table 20. Average surface concentration of Cs-137 radionuclide in the soil in particular provinces of Poland in 2012 (Chief Inspectorate of Environmental Protection, measurements by the Central Laboratory for Radiological Protection)

No	Province	Cs-137	
		Average surface concentration [kBq/m²]	Concentration range [Bq/kg]
1	dolnośląskie	2.55 (0.44-17.97)	25.8 (3.9-188.1)
2	kujawsko-pomorskie	0.75 (0.51-1.18)	6.3 (3.3-10.6)
3	lubelskie	1.19 (0.22-4.81)	12.0 (1.7-57.2)
4	lubuskie	0.73 (0.26-1.29)	6.5 (2.5-10.0)
5	łódzkie	0.65 (0.28-1.80)	6.5 (2.3-17.7)
6	małopolskie	1.89 (0.51-7.65)	25.4 (5.4-109.1)
7	mazowieckie	1.76 (0.46-6.15)	15.5 (4.1-50.0)
8	opolskie	4.02 (0.97-7.80)	32.7 (9.4-61.6)
9	podkarpackie	0.83 (0.33-1.53)	7.7 (2.6-14.4)
10	podlaskie	1.05 (0.71-1.66)	17.8 (6.3-63.8)
11	pomorskie	0.86 (0.42-1.60)	9.3 (3.2-22.2)
12	śląskie	2.50 (0.61-7.84)	26.4 (5.1-77.4)
13	świętokrzyskie	1.28 (0.31-3.55)	12.8 (3.7-26.6)
14	warmińsko-mazurskie	1.02 (0.23-1.82)	10.0 (2.8-18.8)
15	wielkopolskie	0.68 (0.32-1.29)	6.5 (3.2-12.4)
16	zachodniopomorskie	0.50 (0.22-1.19)	5.1 (1.4-9.7)

Table 21. Average concentration of natural isotopes in the soil in particular provinces of Poland in 2012 (the Chief Inspectorate of Environmental Protection, measurements by the Central Laboratory for Radiological Protection)

No	Province	Average concentration (Concentration range) [Bq/kg]		
		Ra-226	Ac-228	K-40
1	dolnośląskie	41.1 (5.5-128.3)	36.0 (6.0-101.7)	551 (178-924)
2	kujawsko-pomorskie	16,4 (10.0-22.7)	16.4 (8.5-23.6)	409 (243-536)
3	lubelskie	17.6 (10.3-32.6)	17.8 (10.0-33.9)	330 (196-552)
4	lubuskie	13.5 (8.6-19.2)	12.7 (8.0-20.3)	312 (224-429)
5	łódzkie	13.1 (7.4-18.2)	13.3 (6.8-22.1)	297 (164-430)
6	małopolskie	33.7 (10.3-57.6)	33.9 (11.6-49.6)	507 (218-816)
7	mazowieckie	13.5 (7.6-21.0)	13.8 (6.8-25.8)	322 (166-525)
8	opolskie	26.9 (7.6-43.5)	25.8 (7.7-43.9)	445 (190-694)
9	podkarpackie	33.7 (4.6-57.6)	32.2 (4.3-47.2)	473 (115-834)
10	podlaskie	17.7 (7.8-26.6)	18.9 (4.4-24.9)	458 (63-588)
11	pomorskie	17.9 (6.0-39.9)	15.9 (4.7-32.8)	350 (175-564)
12	śląskie	28.6 (10.1-51.4)	27.7 (7.7-48.3)	393 (147-627)
13	świętokrzyskie	20.4 (12.6-33.7)	19.8 (6.3-36.1)	318 (112-585)
14	warmińsko-mazurskie	17.9 (9.6-24.2)	16.8 (8.9-28.8)	425 (218-676)
15	wielkopolskie	14.4 (7.6-24.5)	14.0 (6.6-21.0)	335 (212-461)
16	zachodniopomorskie	15.8 (4.3-29.7)	15.3 (4.1-30.3)	335 (181-574)

The average values of deposition of Cs-137 radioisotope in the soil in particular provinces is shown in Figure 16, whereas the average deposition of this radionuclide in the soil in the entire territory of Poland measured chronologically in the years 1988–2012 is presented in Figure 17.

Figure 16. Average surface concentration of Cs-137 (10 cm-thick soil layer) in 2012 in particular provinces of Poland (PAA on the basis of data provided by the Chief Inspectorate of Environmental Protection, measurements by the Central Laboratory for Radiological Protection)

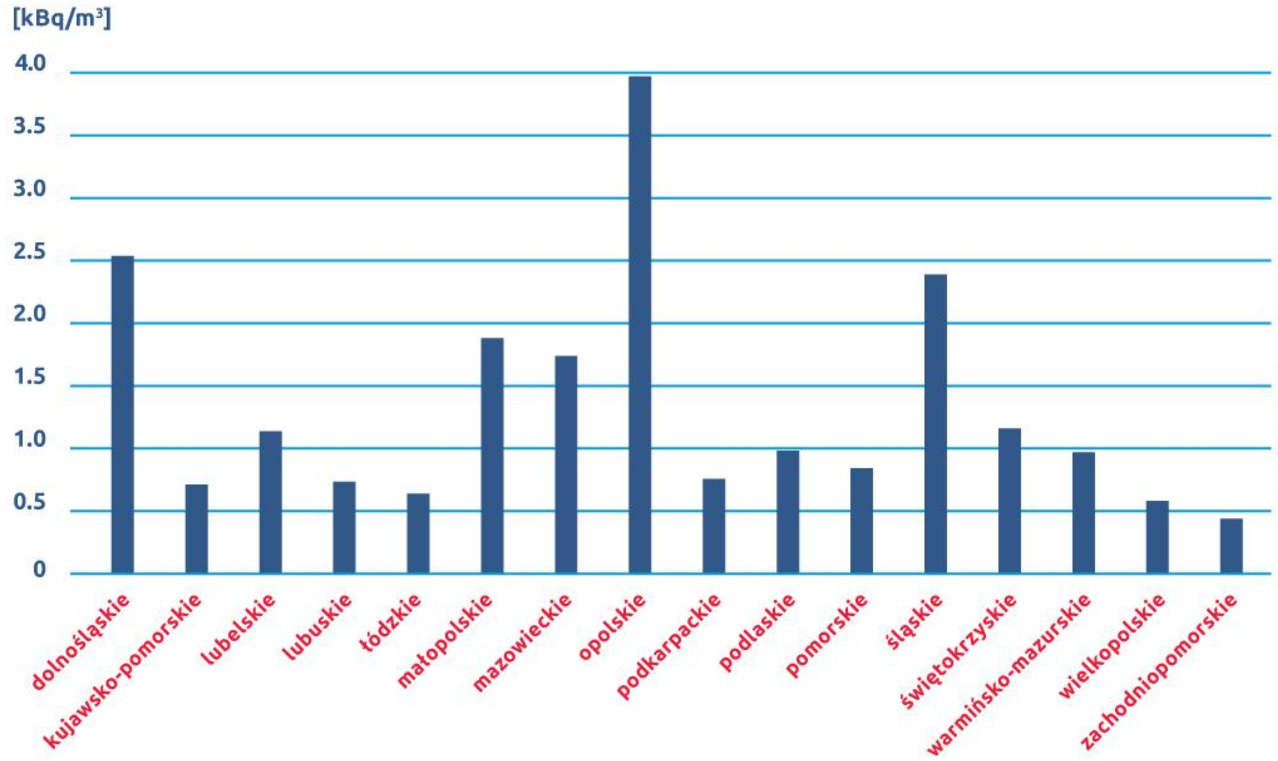
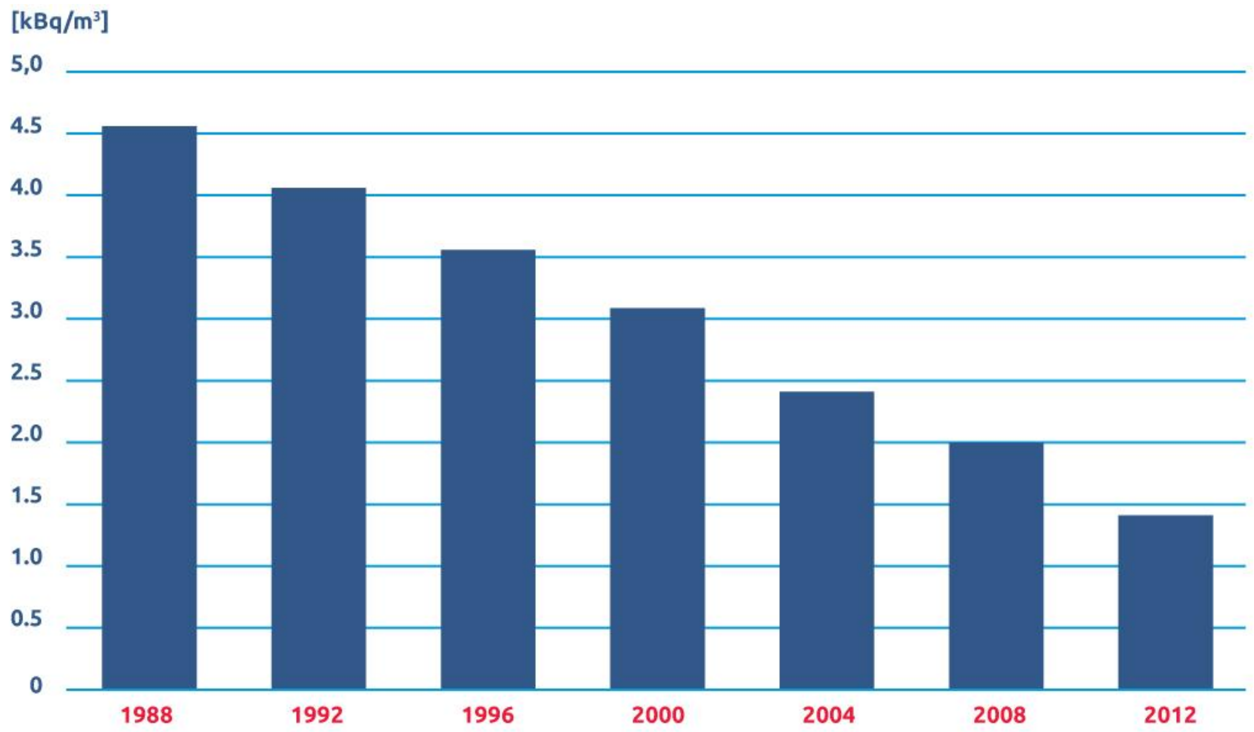


Figure 17. Average surface concentration of Cs-137 (10 cm-thick soil layer) in Poland in years 1998–2012 (PAA on the basis of data provided by the Chief Inspectorate of Environmental Protection, measurements by the Central Laboratory for Radiological Protection)



The average amounts of surface contamination of the soil by Cs-137 in 2012 in the surroundings of the nuclear centre at Świerk and the National Radioactive Waste Repository at Różan amounted to respectively 6.8 Bq/kg and 70.5 Bq/kg. In comparison, the concentration of Cs-137 in the soil within the territory of Poland in 2012 was in the range from 1.4 to 188.1 Bq/kg.

The analysis of the aforementioned data allows to state that:

- Cs-137 radioisotope in the soil comes mainly from the time of Chernobyl accident and its concentration is slowly decreasing due to radioactive decay,
- the average content of Cs-137 in the soil is 20 times lower than the average content of natural radionuclide K-40,
- the average content of Cs-137 radioisotope in the soil in surroundings of the nuclear centre at Świerk and the National Radioactive Waste Repository at Różan is in the range of values measured in other parts of Poland.

XI. 2. RADIOACTIVITY OF BASIC FOODSTUFFS

Activities of radioactive isotopes in foodstuffs, discussed in this section, should be referred to values specified in the Regulation of the Council of European Union No 737/90. This document states that the concentration of Cs-137 and Cs-134 isotopes jointly may not exceed 370 Bq/kg in milk and its products and 600 Bq/kg in all other foodstuffs. At present the concentration of Cs-134 in foodstuffs is below the level of 1‰ of Cs-137 activity. Therefore Cs-134 has been omitted in the further presentation of this section. Lower activities of Cs-137 (as compared to previous and following years) measured in 2006 in some foodstuffs were probably caused by meteorological conditions which had occurred at that time within the territory of Poland (drought periods).

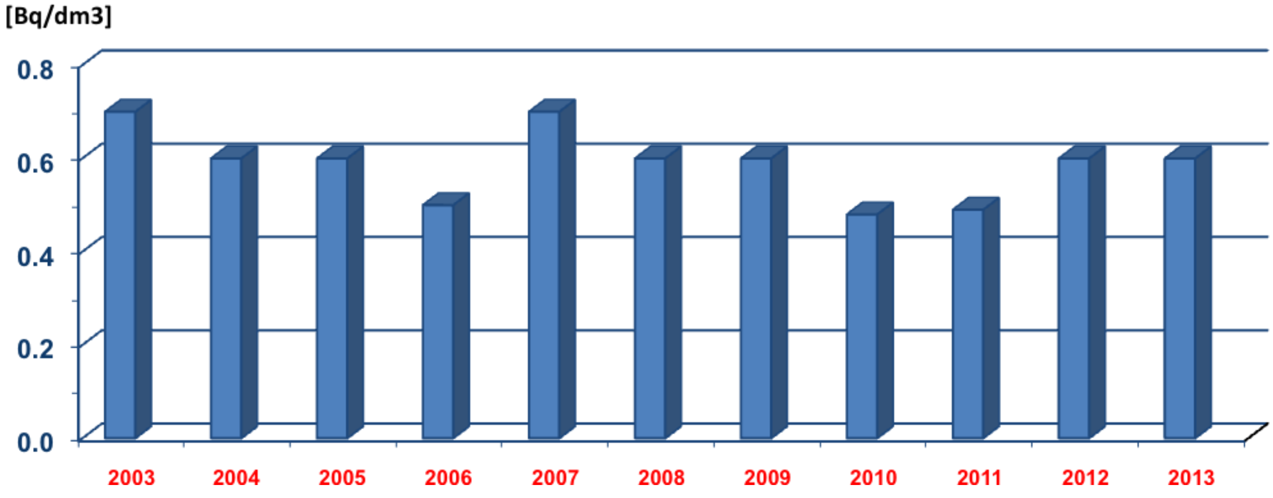
The data shown in this section comes from measurement results provided to the PAA by units conducting measurements of radioactive contamination (sanitary-epidemiological stations).

2.1. Milk

The concentration of radioactive isotopes in milk constitutes an important factor of the assessment of radiation exposure through the alimentary tract. It may be assumed that in an average Polish diet, milk constitutes 20–30% of total alimentary supply.

In 2013, the concentration of Cs-137 in liquid (fresh) milk ranged from 0.09 to 2.3 Bq/dm^3 and amounted on average to approx. 0.6 Bq/dm^3 (Figure 18) constituting approx. 25% of the total alimentary supply of Cs-137. So it was only by approx. 20% higher than in 1985 and by 10-times lower than in 1986 (Chernobyl accident). For the purpose of comparison it is worth reminding that the average concentration of natural radioactive potassium isotope (K-40) in milk amounts to approx. 43 Bq/dm^3.

Figure 18. Annual average concentration of Cs-137 in milk in Poland in years 2003–2013 (PAA on the basis of measurements conducted by sanitary-epidemiological stations)



2.2. Meat, poultry, fish and eggs

The results of Cs-137 activity measurement in various kinds of meat from animal farms (beef, veal, pork) and also in poultry, fish and eggs in 2013 were as follows (annual average concentration of Cs-137):

- meat from animal farms – approx. 0.95 Bq/kg,
- poultry – approx. 0.9 Bq/kg,
- fish – approx. 1.1 Bq/kg,
- eggs – approx. 0.6 Bq/kg.

The timetable of Cs-137 activity in years 2003–2013, in different types of meat from animal farms (beef, veal, pork), and also in poultry, eggs and fish is shown in Figures 19–21. The data provided indicates that in 2013, the average activity of caesium isotope in meat, poultry, fish and eggs was on the same level as in the previous year. Compared to year 1986 (Chernobyl accident), the said activities in 2013 were several times lower.

Figure 19. Annual average concentration of Cs-137 in meat from animal farms in Poland in years 2003-2013 (PAA on the basis of measurements carried out by sanitary-epidemiological stations)

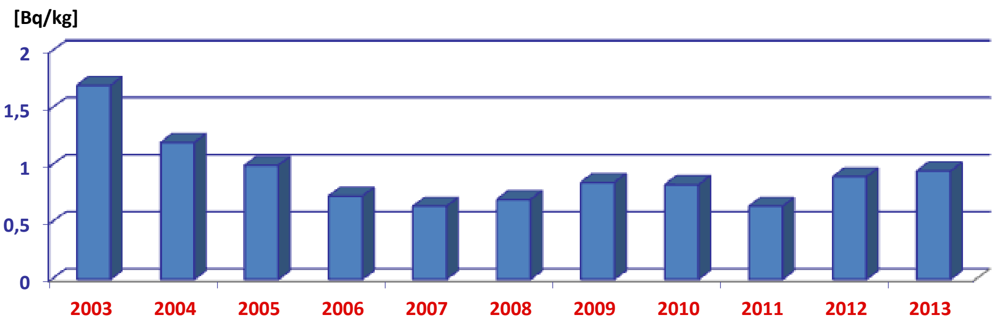


Figure 20. Annual average concentration of Cs-137 in poultry and eggs in Poland in years 2003–2013 (PAA on the basis of measurements carried out by sanitary-epidemiological stations)

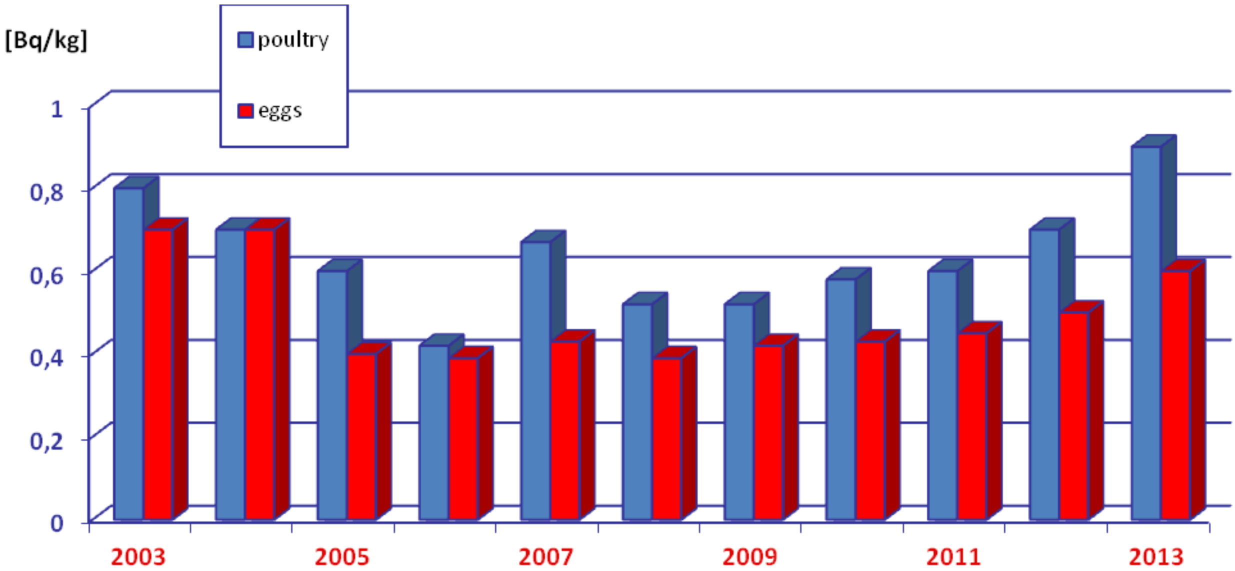
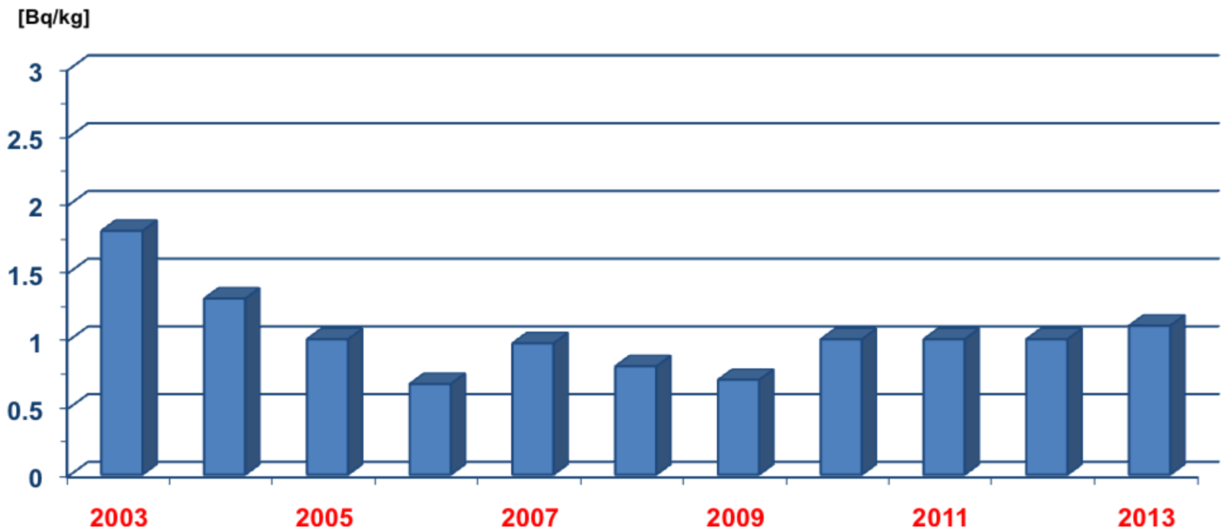


Figure 21. Annual average concentration of Cs-137 in fish in Poland in years 2003–2013 (PAA on the basis of measurements carried out by sanitary-epidemiological stations)



2.3. Vegetables, fruits, cereals and mushrooms

The measurement results of artificial radioactivity in vegetables and fruits in 2013 show that the concentration of isotopes of Cs-137 in vegetables ranged from 0.11–3.84 Bq/kg, on average: 0.5 Bq/kg (Figure 22), and in fruits in the limits from 0.13–2.63 Bq/kg, on average: 0.6 Bq/kg (Figure 23).

In long-period comparisons, the results from 2013 were on the level from the year 1985, and in relation to year 1986 – several times lower.

Figure 22. Annual average concentration of Cs-137 in vegetables in Poland in years 2003–2013 (PAA on the basis of measurements made by sanitary-epidemiological stations)

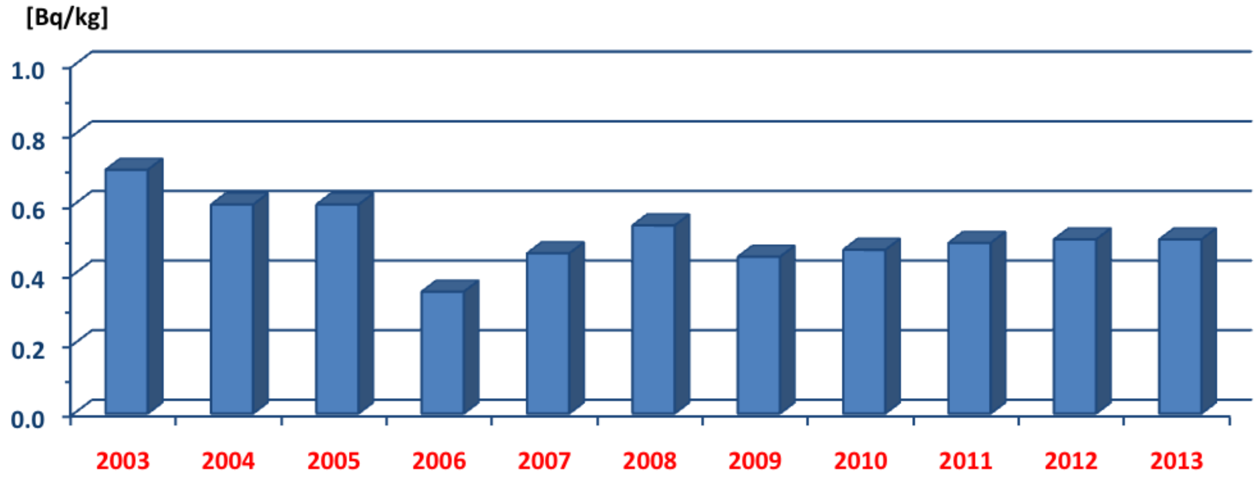
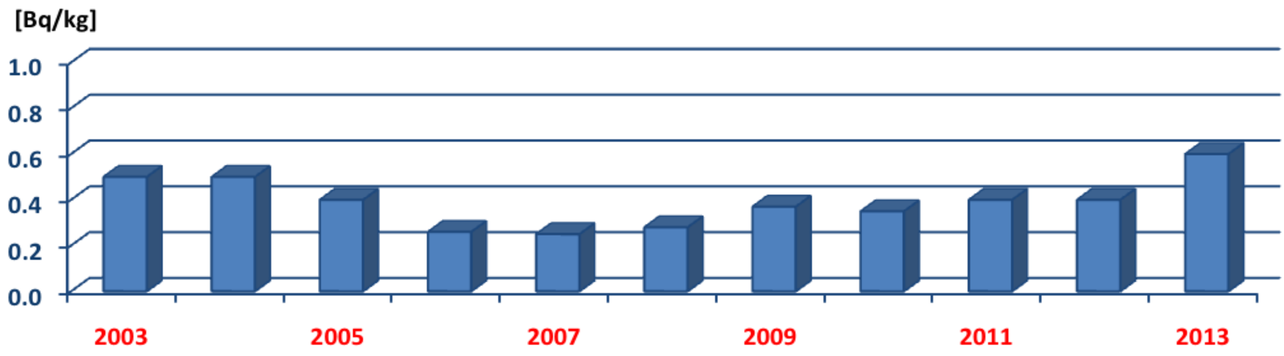


Figure 23. Annual average concentration of Cs-137 in fruits in Poland in years 2003–2013 (PAA on the basis of measurements made by sanitary-epidemiological stations)



The activities of Cs-137 in cereals in 2013 were in the limits from 0.11–3.34 Bq/kg (an average amount: 0.8 Bq/kg) and were similar to amounts measured in 1985.

In the year 2013 the measurements of the content of Cs-137 in cereals were carried out in the surroundings of the National Radioactive Waste Repository at Różan. The activity of Cs-137 in cereals in the surroundings of the NRWR at Różan in 2013 was on the very low level, below detection limit.

The average activities of caesium isotope in the grass in the surroundings of the nuclear centre at Świerk and the NRWR (in reference to dry mass) in 2013 ranged from 0.26 to 13.1 Bq/kg (an average amount: 7.77 Bq/kg) for the nuclear centre at Świerk and from 0.93 to 26.4 Bq/kg (an average amount: 11.99 Bq/kg) for the NRWR.

In comparison to basic foodstuffs, fresh forest mushrooms have got a slightly higher level of Cs-137 activity. The results of measurements carried out in 2013 indicate that the average activity of caesium in basic specimen of fresh mushrooms amounted to approx. 10 Bq/kg. It must be underlined that in 1985 i.e. before Chernobyl accident, the activity of Cs-137 in mushroom was also much higher than in other foodstuffs. At that time, the aforesaid radionuclide had been generated by nuclear weapons tests (which is confirmed by the analysis of relation of isotopes Cs-134 and Cs-137 in 1986).

XI. 3. RADIOACTIVITY OF NATURAL RADIONUCLIDES IN THE ENVIRONMENT INCREASED DUE TO HUMAN ACTIVITIES

Radiological monitoring of the environment also includes monitoring of radiation situation in the territories where there is an increased level of ionizing radiation from natural sources as a result of human activities. These territories cover (as it was already stated in chapter X 'Monitoring of national radiation situation') territories of former uranium ore plants near Jelenia Góra.

For the purpose of interpretation of measurement results, recommendations by the World Health Organization entitled Guidelines for drinking-water quality, Vol. 1 Recommendations. Geneva, 1993 (Item 4.1.3, p. 115) were used introducing the so called reference levels for drinking water. In accordance with the aforesaid guidelines, the total alpha activity of drinking water should not, as a rule, exceed 100 mBq/dm^3, whereas beta activity should not exceed 1000 mBq/dm^3. It must be emphasized that the said levels function as indicators. If they are exceeded, it is recommended to perform the identification of radionuclides.

In line with the monitoring program, in 2013 the measurements of alpha and beta activities were carried out for 45 water samples in the region of former uranium ore plants. The results were as follows:

- public intake facilities of drinking water:
- total alpha activity – from 2.9 to 49.1 mBq/dm^3,
- total beta activity – from 35.5 to 274.7 mBq/dm^3;
- waters flowing out of mining excavations (adits, rivers, ponds, springs, wells):
- total alpha activity – from 3.7 to 670.4 mBq/dm^3,
- total beta activity – from 34.8 to 325.5 mBq/dm^3,
  but the upper activity levels appeared in waters flowing out of the adit No 19a of the former mine 'Podgórze' in Kowary.

Despite the fact that surface and underground waters and waters flowing out of mining excavations are not used as drinking water and do not constitute a direct health hazard, they should be systematically inspected due to their increased radioactivity.

The measurements also included the concentration of radon in water from public intake facilities in the area of the Association of Karkonoskie Counties. The European Union Commission Recommendations No 2001/928 EURATOM state that for public intake facilities with radon concentration exceeding 100 Bq/dm^3, the Member States should individually establish the so-called reference levels of radon concentration; as for concentrations exceeding 1000 Bq/dm^3 it is necessary to take countermeasures for the purpose of radiological protection. In 2013, none of the results regarding radon concentration in water exceeded the amount of 1000 Bq/dm^3.

The concentration of radon in water from public intake facilities and household wells in villages and cities belonging to the Association of Karkonoskie Counties was from 1.5 to 359.0 Bq/dm^3. The concentration of radon in waters flowing out of mining facilities, which displayed the highest total alpha and beta radioactivity, showed the highest value of 422.7 Bq/dm^3 in water flowing out of the adit No 17 of 'Pogórze' mine.

Therefore we may say that even in this region of Poland, where there is potentially the highest radiation hazard from radon in water and from natural radioactive elements in the soil, the threat to local population is negligibly small.

On the basis of data presented in this chapter, it is possible to conclude that the concentration of natural radionuclides in the environment has been on the similar level for several years. However the concentration of artificial isotopes (mainly Cs-137) which originated from the Chernobyl accident and previous nuclear weapon tests is systematically decreasing owing to natural process of radioactive decay. The contents of radionuclides reported do not create radiation risks for the population and the environment in Poland.

NATIONAL ATOMIC ENERGY AGENCY

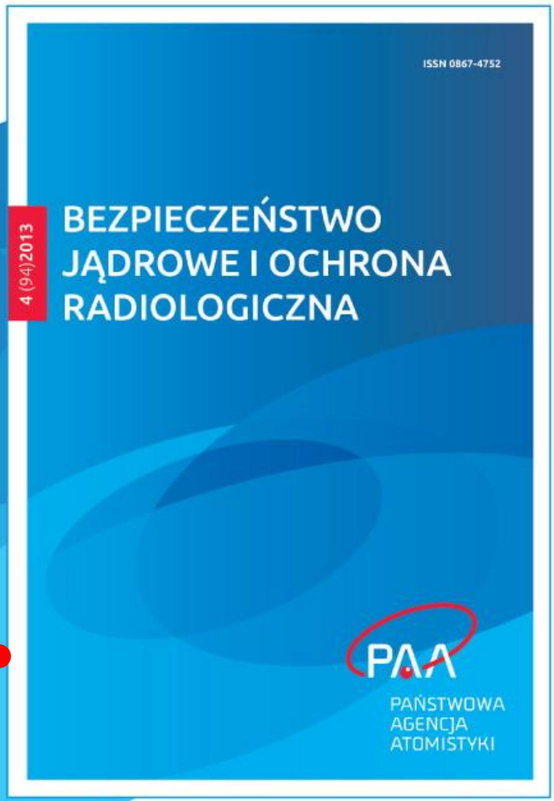
XII. INFORMATION AND EDUCATIONAL ACTIVITIES – PRESENT ACTIVITIES AND PLANS FOR THE FUTURE

Polls made in the countries which possess nuclear power plants show that in order to successfully conduct nuclear power program, it is necessary to gain public trust. It can be achieved only through an independent and competent nuclear regulatory authority. PAA's ambition is to become an office of public trust and one of the ways for fulfilling this objective is to disseminate information on nuclear safety and radiological protection.

Present information activities of PAA are conducted mainly by means of the Internet website. In 2013 PAA prepared a multi-media presentation regarding the extent of tasks and responsibilities of the Agency. The presentation in a friendly manner presents the most important issues concerning the functioning of PAA. It can be found on the Agency's Internet website.

The publication of a quarterly entitled *Nuclear Safety and Radiological Protection* is an important part of educational and promotional activities of PAA. This magazine has a professional character and is addressed to those individuals who work in the field of nuclear safety and radiological protection as well as researches and students (in particular students of technology or nuclear power disciplines).

Nuclear Safety and Radiological Protection bulletin has been published since 1989. So far 90 issues have appeared. In 2013 the magazine was refreshed changing its graphic design which was adjusted to the Visual Identification System. Its electronic version was also launched.



Cover of a quarterly entitled
NUCLEAR SAFETY
AND RADIOLOGICAL PROTECTION

NATIONAL ATOMIC ENERGY AGENCY

XIII. INTERNATIONAL COOPERATION

XIII. 1. MULTILATERAL COOPERATION

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2. BILATERAL COOPERATION

The coordination of Poland's international cooperation in the field of nuclear safety and radiological protection is a statutory task of the President of the National Atomic Energy Agency (PAA). This task is performed by the President in a close cooperation with the Minister of Foreign Affairs, Minister of Economy, and in particular with the Government's Commissioner for Polish Nuclear Power Program and other ministers (heads of central offices) in line with their responsibilities.

In 2013 the PAA President's activities at the international level involved the representation of the Republic of Poland at the forum of international organizations and the bilateral cooperation. The PAA actively participates in the international organizations (Figure 24).

Emblems, national flags of the states and institutions cooperating with the PAA.

XIII. 1. MULTILATERAL COOPERATION

In 2013 the PAA President was involved in the fulfilment of tasks resulting from Poland's multilateral cooperation within the framework of:

- The European Atomic Energy Community (EURATOM) – Poland has been its member since 2004 i.e. since the accession to the European Union;
- The International Atomic Energy Agency (IAEA) – Poland has been its founding member since 1957;
- The Nuclear Energy Agency of the Organization for Economic Cooperation and Development (NEA OECD) – in November 2010 Poland successfully completed its efforts to achieve the full membership;
- The Western European Nuclear Regulators' Association (WENRA) – the cooperation started in 2004 and since 2008 Poland has been holding the status of an observer;
- Meetings of Heads of the European Radiological Protection Competent Authorities (HERCA) – the cooperation started in 2008;
- The Council of Baltic Sea States (CBSS) – Poland has been its founding member since 1992;

By virtue of a decision of the Prime Minister of 20 December 2012, the Minister of Foreign Affairs was indicated as a competent authority for Poland's membership in the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) and for payment of contribution fees. In connection with the above decision, the cooperation task was transferred in 2013 by the National Atomic Energy Agency to the Ministry of Foreign Affairs. The contribution fee in 2013 was still paid by the Agency. This decision was taken on the motion of the PAA President in connection with the disarmament character of CTBTO tasks which are not within the scope of responsibilities of the nuclear regulatory authority.

By virtue of a decision of the Prime Minister of 13 February 2013, the Minister of Science and Higher Education was indicated as a competent authority for Poland's membership in the European Organization for Nuclear Research (CERN) and the Joint Institute for Nuclear Research (JINR) and for payment of relevant contribution fees to these organizations. In connection with the above decision the tasks of cooperation with CERN and JINR were transferred in 2013 from the National Atomic Energy Agency to the Ministry of Science and Higher Education. The contribution fees in 2013 were still paid by the Agency. This decision was taken on the motion of the PAA President in connection with scientific goals fulfilled by CERN and JINR which are not within the competence of the nuclear regulatory authority.

1.1. Cooperation with international organizations

1.1.1. The European Atomic Energy Community (EURATOM)

The European Atomic Energy Community is an intergovernmental organization established by virtue of the Rome Treaty which had been signed on 25 March 1957 by France, the Federal Republic of Germany Italy, Belgium, the Netherlands and Luxemburg. After the amendments made by virtue of the Lisbon Treaty which was signed on 13 December 2007, the modified EURATOM Treaty entered into force on 1 December 2009. The preamble of the treaty stipulates that nuclear energy is a necessary mean for development and revival of industry and it contributes to preserve peace in Europe. The aim of the Community is to contribute to the raising of the standard of living in the Member States and to the development of relations with the other countries by creating conditions necessary for the speedy establishment and growth of nuclear industries.

The PAA's activities connected with the membership of Poland in the EURATOM Community in 2013 focused mainly on works conducted in two groups which are crucial from the nuclear regulator's perspective:

- European Nuclear Safety Regulators' Group ENSREG consisting of representatives of the senior management of European nuclear regulators from the Member States and having advisory competence for the European Commission;
- Working Party on Atomic Questions – B.07 WPAQ in which the PAA holds leading competence. The most important subject of works in this Group was the continuation of a debate started in the second half of 2011 on the draft of new directive of the Council lying down basic safety standards for the protection against dangers resulting from the exposure to ionizing radiation, so called Basic Safety Standards (BBS)

Atomic Questions Working Party (end of Lithuanian presidency)

A new BBS directive was developed by combining in one five independent directives regarding protection against ionizing radiation:

- Council Directive 96/29/Euratom (BBS) laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation
- Council Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionizing radiation in relation to medical exposure,
- Council Directive 89/618/ Euratom on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency
- Council Directive 90/641/Euratom on the operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas
- Council Directive 2003/122/Euratom on the control of high-activity sealed radioactive sources and orphan sources

This merger clearly shows the process aimed at simplifying and ordering secondary legislation of the European Union. The directive takes into account the latest standards in terms of the protection against ionizing radiation developed by the specialized international institutions i.e. ICRP (*International Committee of Radiological Protection*) and IAEA.

The discussion in the EU Council devoted to BSS directive was conducted in technical meetings with the participation of national experts whose task was to prepare a common position regarding strictly technical issues and also in plenary meetings of the group whose task was to accept the arrangements made by experts and discuss the contents of BSS directive. In relation to ionizing radiation uses in medical procedures, PAA started cooperation with the Ministry of Health and National Centre for Radiological Protection in Health Protection (NCRP). A NCRP expert together with PAA expert each time participated in experts' meetings during which fragments of BSS directive regarding medical uses of ionizing radiation were discussed. In relation to issues regarding natural radioactivity in building materials, PAA started similar cooperation with the Ministry of Infrastructure, Construction and Sea Management.

The discussion on the BBS directive ended during the Irish presidency (after first six months of 2013) and then the full political agreement was reached in the EU Council with regard to the adoption of compromise text which was approved by all the Member States and the European Commission.

Finally, Council Directive 2013/59/Euratom laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom was officially adopted by the EU Council on 5 December 2013.

The other vital topic discussed by the Group during the period of Lithuanian presidency (second half of 2013) concerned amendments to the Council directive, now enforceable, establishing a community framework for nuclear safety of nuclear facilities (*Nuclear Safety Directive*- NSD).

The most important proposals for amendments to the present directive consist in strengthening the role and actual independence of national nuclear regulatory bodies in the Member States, enhancing transparency in terms of access to information on nuclear safety and introducing, apart from the existing obligation for international review of nuclear regulators, the compulsory independent safety reviews of nuclear facilities and finally promoting 'nuclear safety culture' in its widest meaning.

Nuclear power plants operating within the territory of the European Union were in the year 2011 and 2012 subject to inspection procedures regarding natural dangers such as earthquakes and floods, which was a direct consequence of Fukushima accident. These procedures consisted in comprehensive safety and risk analyses and stress tests of nuclear power plants located in the European Union's territory and their objective was to identify safety areas for improvement.

Amendments to the NSD directive were proposed by the European Commission as a response to results of analyses conducted in the European Union in accordance with the conclusions contained in the document entitled: *The Communication from the Commission to the Council and the European Parliament on the comprehensive risk and safety assessments ('stress tests') of nuclear power plants in the European Union and related activities*

Owing to Poland's membership in the European Atomic Energy Community, the PAA representatives also participated in the proceedings of other working groups and consulting bodies of the Council of the European Union and the European Commission related to the PAA President's tasks and responsibilities. The PAA representatives participated in the works of:

- Committee for Nuclear Decommissioning Assistance Programme
- Working Groups: for basic safety standards for the protection of health of workers and population against ionizing radiation, established on the basis of Article 31 of the EURATOM Treaty;
- Working Group for radioactive waste management established on the basis of Article 37 of the EURATOM Treaty;
- Groups for continuous monitoring of the levels of radioactivity in air, waters, soil and for control of the compliance with basic safety standards and for control by the European Commission of radiation situation in Member States in accordance with Article 35 and for providing to the European Commission measurement results from national radiological monitoring in normal circumstances and in radiation emergency (Article 36 of the EURATOM Treaty);
- Advisory Committee established on the basis of Article 21 of the Council Directive 2006/117/EURATO of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent nuclear fuel;
- Standing Working Group of the European Commission for Safe Shipment of Radioactive Materials;

In 2013 the PAA's Nuclear Regulatory Inspectors continued their participation in the inspections of nuclear facilities carried out in Poland by the EURATOM inspectors. What is more, it must be emphasized that Poland represented by the PAA is a link of data monitoring exchange systems within the frame of the European Union.

These systems include: data exchange system from regular radiation monitoring of the environment and the European Radiological Data Exchange Platform ERDEP i.e. data exchange system from early warning stations for radioactive contamination (dose rate). More information about the functioning of the systems may be found in chapter X.3 'National radiological monitoring' – 'Participation in international exchange of radiological monitoring data'.

1.1.2. The International Atomic Energy Agency (IAEA)

The International Atomic Energy Agency is a specialized agenda of the United Nations Organization, established in 1957, functioning as a centre of cooperation in the fields relating to the safe use of nuclear energy for peaceful purposes.

The IAEA's aim, as provided for in its Statute is 'to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world' and to 'ensure so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose'. The IAEA's top policy making organ is the General Conference whose sessions are held every year. In 2013 the session of the General Conference was held in September in Vienna. The PAA delegation led by the PAA President attended the said Conference.

Poland's membership contribution payable to the IAEA (paid through the PAA budget) in 2013 amounted to:

- 1,943,516 EURO and 444,399 USD to the Regular Budget,
- 285,061 EURO and 354,113 USD for the Technical Cooperation Fund.

Both amounts are calculated on the basis of UN contributions scale for a given state in a given year.

Regulatory Cooperation Forum

The Regulatory Cooperation Forum (RCF) is a relatively new initiative of the International Atomic Energy Agency whose aim is to coordinate the cooperation between nuclear regulatory authorities in the countries which introduce nuclear energy industry and nuclear regulatory authorities of the countries which already have got a well developed nuclear energy sector. The strategy of the Forum's program concentrates on the elaboration of a plan of activities adjusting the nuclear safety infrastructure to the objective of supervision over nuclear power plants and the performance of this plan in cooperation with experienced international partners. The cooperation involves consultations, peer reviews, trainings and exchange of employees.

In September 2013, during a meeting with the PAA's representative, the PAA President's proposal was discussed regarding the start of cooperation between PAA and RCF in terms of the conduct of on-job-trainings for merit-based employees of PAA in nuclear regulatory authorities in countries which have got a developed nuclear power energy industry. The said proposal was accepted and will be further implemented in 2014.

Cooperation in establishing the IAEA Safety Standards

A vital part of IAEA's activities is dedicated to establishing safety standards for peaceful use of nuclear energy. Works on these standards are performed by five committees and one commission:

- Nuclear Safety Standards Committee (NUSSC),
- Radiation Safety Standards Committee (RASSC),
- Waste Safety Standards Committee (WASSC),
- Transport Safety Standards Committee (TRANSSC),
- Security Guidance Committee (NSGC)
- PAA experts actively participate in the works of all mentioned committees.

Scientific and technical cooperation and the IAEA's technical assistance for Poland

Table 22 shows data concerning amounts of technical assistance (supplies of unique equipment and devices, foreign trainings and fellowships, peer reviews) obtained by Poland through the IAEA in recent years.

Table 22. Technical assistance granted to Poland by the IAEA (in the form of national projects) in years 2002–2013

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
USD	428	278	579	1664	265	632	535	544	212	295	150	133

Table 23. The IAEA technical assistance programs implemented in Poland in 2013

The IAEA Program No	Project name (subject)	Beneficiary
POL/0/011	Development of capacities for basic and applied research in atomic energy field	Institute of Nuclear Chemistry and Technology
POL/2/016	Support of infrastructure development for nuclear power	Ministry of Economy
POL/9/021	Preparing nuclear regulator for the oversight of nuclear power	National Atomic Energy Agency

In 2013, Poland participated in 20 regional cooperation projects of the IAEA (Middle and Eastern Europe region) and inter-regional cooperation, out of which 13 were of strictly nuclear regulatory nature and were coordinated by the PAA representatives.

Other fields and forms of cooperation with the IAEA

Cooperation with the IAEA also included such areas as:

- participation in the Emergency Notification and Assistance Convention, ENAC – an international system coordinated by the IAEA. The National Contact Point of this system operates 24 hours a day at the PAA Radiation Emergency Centre.
- participation in the International Nuclear and Radiological Event Scale classification system, which ensures, among other things, updated information, available at the IAEA, about incidents, which due to local impact are not included in the early warning procedures.
- performance of obligations in the scope of state control over the trade and flow across the territory of Poland of nuclear materials and devices which are subject to special supervision in order to counteract the proliferation of nuclear weapons (including supervision over the realization of obligations connected with the safeguards system by Poland). This task is realized by a contact point at the Non-proliferation Unit at the Nuclear Safety Department of the PAA in cooperation with the Ministry of Economy and the Ministry of Foreign Affairs.
- current cooperation in nuclear safety and radiological protection consisting in, inter alia, the participation of Polish experts in developing and amending the IAEA requirements and guidance. In April 2013 the international team of senior experts appointed by the IAEA performed the review of PAA activities in the framework of Integrated Regulatory Review Service (IRRS) mission. The mission ended with the publication of IRRS report which is made available to the general public.

1.1.3. The Nuclear Energy Agency of the Organization for Economic Cooperation and Development (NEA OECD)

The Nuclear Energy Agency – NEA is an independent, specialized agency of the OECD with its seat in Paris. Its basic aim is to support the Member States in the development of peaceful use of nuclear energy in a safe, environmentally friendly and economically profitable manner. These aims are realized through international cooperation, organization of joint research, preparation of legal acts and technological solutions. The NEA includes 30 out of 34 OECD states and supports the Member States in their use of nuclear energy for peaceful purposes.

The NEA's activities are based on the cooperation of national experts in 7 standing technical committees and several working groups which report to them (there are only 65 employees working at the NEA). Poland became the NEA member in 2010. Poland's membership was preceded by study visits of the NEA management to Poland, also at the PAA. The membership in the NEA allows Poland to widely exchange experience with other Member States, which is particularly important as almost all countries having nuclear energy belong to the NEA.

Three out of the NEA committees deal directly with the PAA's scope of activity i.e. Committee on Nuclear Regulatory Activities – CNRA, Committee on the Safety of Nuclear Installations – CSNI and Nuclear Law Committee – NLC.

PAA joined the works of the aforesaid committees just before Poland's accession to the NEA. From the viewpoint of the PAA's preparations for the implementation of the Polish Nuclear Power Program, the participation, within the framework of the CNRA, in the Working Group on Regulation of New Reactors – WGRNR, is especially important. PAA also participates in the Working Party on Nuclear Emergency Matters – WPNEM, which seeks to improve national systems for detecting and mitigating radiation emergencies.

Since Poland's accession to the NEA, PAA additionally participated in the CNRA working groups such as Working Group on Public Communication of Nuclear Regulatory Organizations – WGPC, Working Group on Inspection Practices – WGIP and Working Group on Risk Assessment – WGRISK.

1.2. Other forms of multilateral cooperation

1.2.1. The Western European Nuclear Regulators' Association (WENRA)

The Western European Nuclear Regulators' Association WENRA assembles on a voluntary basis, the heads of nuclear regulators of the European Union Member States and Switzerland who operate nuclear power plants (in total seventeen states). The aim of this organization is harmonization of requirements and practices regarding siting, design, construction and operation of nuclear power plants and their decommissioning, storage and disposal of radioactive waste and also systematic enhancement of safety.

WENRA operates through permanent or ad hoc working groups and elaborates so called Safety Reference Levels (SRLs) in terms of safety of nuclear power plants (permanent: Reactors' Harmonization Working Group, RHWG) and decommissioning storage and disposal of weste (permanent: Working Group for Waste and Decommissioning, WGWD). WENRA Reference Levels were used in legislative works in Poland concerning the amendment of the Atomic Law Act.

PAA has been participating in plenary meetings of the Association since 2004 and since 2008 has been holding the observer status.

In 2013 WENRA meetings were dedicated to the review of the implementation of SRLs in WENRA countries taking into account changes resulting from lessons learnt after Fukushima nuclear power plant accident with regard to extreme external events, containment functions, guidance on the management of severe accidents (SAMG) and the role of periodic safety reviews (PSR) in the process of continuous improvement of safety level of nuclear power plants currently operated.
WENRA approved also the RHWG raport which determines WENRA positions regarding the fulfilment of safety objectives for new-built nuclear power plants, taking into account the extended design conditions. Apart from RHWG report, WGWD reports were approved which present the progress in the implementation of national action plans in terms of SRLs concerning waste storage and disposal. In 2013 two WENRA plenary meetings were held, with participation of PAA Vice-President. The first meeting was an occasion to present at WENRA forum legislative and organizational changes of nuclear regulatory authority in Poland necessitated by the preparations to the implementation of Polish Nuclear Power Program. The other meeting, combined with a technical visit to Chernobyl, was mainly devoted to safety issues regarding decommissioning of the nuclear power plant as well as storage and disposal of waste.

1.2.2. Meetings of Heads of European Radiation Control Authorities (HERCA)

The HERCA (Heads of European Radiation Control Authorities) is a relatively new platform for cooperation of European nuclear regulators. PAA representatives have participated in its plenary meetings and working groups since 2009. Last year the representative of Poland (the PAA Vice-President) participated in the meeting of its superior authority i.e. Board of Heads of Radiation Control Authorities in Reykjavík. The meeting was devoted to:

- tightening the cooperation with the International Commission of Radiological Protection represented in the meeting by the ICRP Chairman in the context of the ICRP's strategic plan for years 2011-2017,
- developing European platform ESOREX for electronic exchange of data on doses absorbed by workers who are exposed to radiation at work,

- a survey of activities and initiatives of the European Commission in radiological protection field, including training of Radiation Protection Officers and Radiation Protection Experts in radiological protection,
- current relations of HERCA with different stakeholders and
- a review of works performed in the following 4 working groups within HERCA with the participation, similarly to the previous years, of Polish representatives:

  - WG-E - group for radiation emergencies,
  - WG 1 - group for dosimetric passports and external workers,
  - WG MA - group for medical applications of ionizing radiation,
  - WG - group for non-medical sources and radiation uses

The following reports on radiation emergencies, presented at HERCA forum, deserve closer attention:
- Management of recovery phase after of a severe accident in a nuclear power plant with widely spread radiological consequences
- Harmonization of European response to a severe accident in the nuclear power plant situated in the EU or in a direct vicinity to the EU and in the area remote from the EU.

1.2.3. The Council of the Baltic Sea States (CBSS)

The Council of the Baltic Sea States was established in March 1992 at the Conference of Ministers of Foreign Affairs. It consists of the representatives of Denmark, Estonia, Finland, Iceland (since 1993), Germany, Lithuania, Latvia, Norway, Poland, Russian Federation and Sweden.

The PAA represents Poland in the Expert Group on Nuclear and Radiation Safety – EGNRS. The information about the exchange of data from early warning stations for contamination within the framework of the Council of Baltic Sea States (CBSS) system is presented in chapter X.3 entitled 'National radiological monitoring' – 'Participation in the international exchange of radiological monitoring data'.

1.2.4. The European Nuclear Security Regulators Association (ENSRA)

The beginning of the European Nuclear Security Regulators Association goes back to 1990, when an informal group was established consisting of the representatives of nuclear regulators of Belgium, Germany, France, Sweden, Spain and United Kingdom. This group was transformed into the Association called ENSRA in 2004. At present the Association groups 14 Member States of the European Union. The main goals of the Association include the exchange of information on physical protection of nuclear material and facilities and the promotion of harmonized approach to physical protection in the countries of the European Union.

In November 2013 an annual plenary meeting of the Association was held in Spain. It was the first meeting in which Poland participated as a regular member of the Association. The meeting was organized by the Spanish nuclear regulatory authority: Council of Nuclear Security – Consejo de Seguridad Nuclear, CSN.

The main items of the meeting's agenda included: information of ENSRA's members on activities in physical protection field, Report of the Working Group on the procedures for checking individuals allowed to work with nuclear material used in the EU countries and represented in ENSRA (background checks).

In 2013 Finland sent to ENSRA countries a questionnaire regarding the verification of individuals allowed to work in nuclear facilities. There are no identical procedures on this matter in ENSRA countries. Therefore, the suggestion was put forward by a few countries to discuss this issue during the meetings of Atomic Questions Working Group.

The Working Group's Report on training.
In October 2014 in Delft in the Netherlands a training will be organized entitled: 'Train-the-Trainers course for European countries.' The aim of this training is to prepare a group of experts who will act as lectures in trainings on physical protection organized by the IAEA in cooperation with ENSRA.

Review of the Association's 'terms of reference'.
Taking into consideration recommendations of Ad Hoc Group on Nuclear Security Report from May 2012, ENSRA undertook to review its terms of reference and to admit to the Association next countries with nuclear reactors and to tighten cooperation by the exchange of good practices between ENSRA countries. It is envisaged that new terms of reference will be adopted in 2014.
Fulfillment of AHGNS recommendations by ENSRA countries.
In accordance with AHGNS recommendations, ENSRA decided to conduct a review of the fulfillment of AHGNS recommendations among the EU member states which are also ENSRA members. Such review will be included in the agenda of annual plenary meetings of ENSRA.

Bulgaria and Romania were invited to participate in ENSRA's meetings as observers.

1.2.5. The European Safeguards Research and Development Association (ESARDA)

The PAA has been a full member of the European Safeguards Research and Development Association – ESARDA since 2009. It is an organization of the EU countries constituting a forum of the exchange of information and experience concerning nuclear material safeguards. The Association groups scientific institutes, universities, industrial companies, specialist and administration bodies of EU countries. Within the Association there are a few theme working groups. These groups deal with such issues as: implementation of principles for nuclear material safeguards, inspection of locks and access to nuclear material, damaging and non-damaging measurements, techniques and methodology of verification, knowledge and training management, application of Novell network technology, control of export of goods as well as strategic and dual use technologies.

In 2013 the annual meeting of the Association was held in Belgium. Around 200 specialists from the EU members states, invited employees from the IAEA and EURATOM and specialists from the U.S. took part in the meeting. The PAA representative participated in the meeting of the Steering Committee and in the meeting of the Working Group for Implementation of Nuclear Material Safeguards.

During the meetings, information was presented on current tendencies, problems and standards used in nuclear material safeguards and also reports were presented on trainings and workshops in nuclear material safeguards and accountancy. In connection with the Association's activities aimed at the popularization of knowledge on nuclear material safeguard and the cooperation with U.S. organizations, new ESARDA member organizations were introduced at the meeting, including the University of Liege, University of Hamburg and Oak Ridge National Laboratory from the U.S.

Trainings and courses under the auspices of the European Commission also for the states outside the EU are organized by the Joint Research Centre in Ispra. Information about courses and activities of ESARDA is available in the Internet website of the Association: http://esarda.jrc.ec.europa.eu/

XIII. 2. BILATERAL COOPERATION

To ensure nuclear and radiological safety, the Republic of Poland signed a number of international bilateral agreements whose performance was entrusted to the PAA President. The agreements concerning early notification of nuclear accident and exchange of information and experience were concluded with the neighbouring countries in accordance with the international Convention on Early Notification of Nuclear Accident, i.e. with the Russian Federation (it refers to the zone of 300 km from the Polish border, this area encompasses the Kaliningrad Oblast), Lithuania, Belarus, Ukraine, Slovakia, Czech Republic, Austria, Denmark, Norway and Germany. Additionally PAA signed agreements on cooperation with American and French nuclear regulatory authority.

Due to the fact that around Poland's borders there is a number of operating nuclear power plants, the cooperation with nuclear regulators of the neighbouring countries, conducted in accordance with the aforementioned intergovernmental agreements, is an essential element of our radiological safety.

In accordance with the agreements on bilateral cooperation, in 2013 the PAA representatives took part in the meetings with Austria, Belarus and Slovakia and PAA delegation paid visit to Swedish nuclear regulator (SSM).

The main topic of the meeting with Austria was Polish preparations to the Nuclear Power Program and the exchange of information concerning the Integrated Regulatory Review Service (IRRS) mission conducted in both countries.

During the meeting with Belarus, partners discussed issues regarding legal aspects of the functioning of nuclear regulators in both countries. Belarus' delegation provided information about the status of works with regard to Belarussian nuclear power plant and the involvement of Gostatomnadzor (Belarusian nuclear regulatory authority) in the construction process. The Belarusian partners were also informed about the process and results of IRRS mission in PAA.

The main topics discussed during the meeting with Slovakia were the functioning of radiological monitoring, oversight of nuclear material users and methods for the conduct of nuclear facilities inspections in Slovakia. The topics of discussions with Swedish partner focused mainly on issues regarding radioactive waste and spent nuclear fuel management as well as new safety requirements for Swedish nuclear power plants.

During the analysis of possible radiation events, partners of bilateral agreements use identical criteria determined by so-called International Nuclear and Event Scale system (INES) developed by the IAEA.

NATIONAL
ATOMIC ENERGY
AGENCY

XIV. APPENDICES

APPENDIX NO 1

LIST OF SECONDARY LEGISLATION OF THE ATOMIC LAW ACT OF 29 NOVEMBER 2000

Regulations

1. Regulation of the Council of Ministers of 6 August 2002 on the cases when activities involving exposure to ionizing radiation do not require authorization or notification and on the cases when such activities may be conducted on the basis of notification (Journal of Laws, No 137, Item 1153 and Journal of Laws of 2004, No 98, Item 980),
2. Regulation of the Council of Ministers of 6 August 2002 on Nuclear Regulatory Inspectors (Journal of Laws, No 137, Item 1154),
3. Regulation of the Council of Ministers of 3 December 2002 on the documents required when applying for authorization to conduct activities involving exposure to ionizing radiation or when notifying the conduct of such activities (Journal of Laws No 220, Item 1851, Journal of Laws of 2004, No 98, Item 981, Journal of Laws of 2006, No 127, Item 883 and Journal of Laws of 2009, No 71, Item 610),
4. Regulation of the Council of Ministers of 3 December 2002 on radioactive waste and spent nuclear fuel (Journal of Laws,No 230, Item 1925),
5. Regulation of the Council of Ministers of 17 December 2002 on the stations for early detection of radioactive contamination and on the units conducting measurements of radioactive contamination (Journal of Laws, No 239, Item 2030),
6. Regulation of the Council of Ministers of 23 December 2002 on the requirements for dosimetric equipment (Journal ofLaws, No 239, Item 2032),
7. Regulation of the Council of Ministers of 27 April 2004 on values of intervention levels for particular types of intervention measures and criteria for revoking these measures (Journal of Laws, No 98, Item 987),
8. Regulation of the Council of Ministers of 27 April 2004 on specifying entities competent for performing inspection of foodstuffs and feeding stuffs with regard to their compliance with maximum admissible levels of radioactive contamination following a radiation emergency (Journal of Laws, No 98, Item 988),
9. Regulation of the Council of Ministers of 27 April 2004 on the protection against ionizing radiation of outside workers exposed during their work in the controlled area (Journal of Laws, No 102, Item 1064),
10. Regulation of the Council of Ministers of 27 April 2004 on prior information for the general public in the event of radiation emergency (Journal of Laws, No 102, Item 1065),
11. Regulation of the Council of Ministers of 18 January 2005 on ionizing radiation dose limits (Journal of Laws, No 20, Item 168),
12. Regulation of the Council of Ministers of 18 January 2005 on emergency response plans in case of radiation emergency (Journal of Laws, No 20, Item 169 and Journal of Laws of 2007, No 131, Item 912),
13. Regulation of the Minister of Health of 7 April 2006 on the minimum requirements for healthcare centres applying for the consent to conduct activities involving exposure to ionizing radiation for medical purposes which consist in the performance of services relating to oncologic radiotherapy (Journal of Laws, No 75, Item 528, Journal of Laws of 2011, No 48, Item 252 and Journal of Laws of 2012, Item 471)
14. Regulation of the Council of Ministers of 12 July 2006 on the detailed safety requirements for work involving ionizing radiation sources (Journal of Laws, No 140, Item 994),
15. Regulation of the Minister of Health of 21 August 2006 on the special conditions for safe work with radiological devices (Journal of Laws, No 180, Item 1325),
16. Regulation of the Minister of Health of 22 December 2006 on supervision and control of the compliance with radiological protection conditions at organizational entities using X-ray devices for the purpose of medical diagnostics, surgery radio therapy, surface radiotherapy and non-cancerous diseases radiotherapy (Journal of Laws of 2007, No 1, Item 11),
17. Regulation of the Council of Ministers of 2 January 2007 on the requirements concerning the content of natural radioactive isotopes: potassium K-40, radium Ra-226 and thorium Th-228 in raw materials and materials used in buildings accommodating humans and livestock, as well as in industrial waste used in construction industry and on the inspection of the content of these isotopes (Journal of Laws, No 4, Item 29),
18. Regulation of the Minister of Health of 2 February 2007 on the detailed requirements concerning the form and content of standard and working medical radiological procedures (Journal of Laws, No 24, Item 161),
19. Regulation of the Council of Ministers of 20 February 2007 on the basic requirements for controlled and supervised areas (Journal of Laws, No 131, Item 910);
20. Regulation of the Council of Ministers of 20 February 2007 on the conditions for import onto the territory of the Republic of Poland, export out of the territory of the Republic of Poland and transit through this territory of nuclear materials, radioactive sources and devices containing such sources (Journal of Laws, No 131, Item 911);
21. Regulation of the Council of Ministers of 23 March 2007 on requirements concerning registration of individual doses (Journal of Laws, No 131, Item 913);
22. Regulation of the Council of Ministers of 4 October 2007 on the allocated and special purpose subsidy, fees and financial management of the state-owned public utility enterprise – 'the Radioactive Waste Management Plant' (Journal of Laws, No 185, Item 1311);

23. Regulation of the Minister of Health of 27 March 2008 on the minimum requirements for health care entities performing health services in the area of X-ray diagnostics, surgery radiology, diagnostics and radioisotope therapy of non-cancerous diseases (Journal of Laws, No 59, Item 365),
24. Regulation of the Minister of Health of 27 March 2008 on the data base of radiological devices (Journal of Laws, No 59, Item 366),
25. Regulation of the Council of Ministers of 21 October 2008 on granting authorization and consent for import onto the territory of the Republic of Poland, export from the Republic of Poland and transit through this territory of radioactive waste and spent nuclear fuel (Journal of Laws, No 219, Item 1402),
26. Regulation of the Council of Ministers of 4 November 2008 on physical protection of nuclear materials and nuclear facilities (Journal of Laws, No 207, Item 1295);
27. Regulation of the Prime Minister of 8 January 2010 on the manner of exercising supervision and control at the Internal Security Agency, the Foreign Intelligence Agency and the Central Anticorruption Bureau by nuclear regulatory authorities (Journal of Laws, No 8, Item 55),
28. Regulation of the Minister of Health of 18 February 2011 on the conditions of the safe use of ionizing radiation for all types of medical exposure (Journal of Laws, No 51, Item 265 and Journal of Laws of 2012, Item 470),
29. Regulation of the Minister of Interior and Administration of 13 April 2011 on the list of border crossing through which nuclear materials, radioactive sources, devices containing such sources, radioactive waste and spent nuclear fuel may be imported into and exported from the territory of the Republic of Poland (Journal of Laws, No 89, Item 513);
30. Regulation of the Minister of Finance of 14 September 2011 on the guaranteed minimum amount of the compulsory civil liability insurance of the nuclear facility's operator (Journal of Laws, No 206, Item 1217);
31. Regulation of the Minister of Health of 29 September 2011on psychiatric and psychological tests of employees performing activities important for nuclear safety and radiological protection at the organizational entity conducting activities involving exposure which consist in commissioning, operation or decommissioning or a nuclear power plant (Journal of Laws, No 220, Item 1310);
32. Regulation of the Minister of the Environment of 9 November 2011 on the standard form of identity document of Nuclear Regulatory Inspector (Journal of Laws, No 257, Item 1544);
33. Regulation of the Minister of the Environment of 18 November 2011 on the Council for Nuclear Safety and Radiological Protection (Journal of Laws, No 279, Item 1643) which came into force on 11 January 2012;
34. Regulation of the Council of Ministers of 27 December 2011 on the standard form of the quarterly report on the amount of fee paid for decommissioning fund (Journal of Laws of 2012, Item 43), which entered into force on 28 January 2012;
35. Regulation of the Council of Minister of 26 March 2012 on the special purpose subsidy granted for ensuring nuclear safety and radiological protection of Poland while using ionizing radiation (Journal of Laws of 2012, Item 394) which came into force on 13 April 2012;
36. Regulation of the Council of Ministers of 27 December 2011 on periodical safety assessment of a nuclear facility (Journal of Laws of 2012, Item 556);
37. Regulation of the Minister of Economy of 23 July 2012 on detailed rules concerning the establishment and operation of Local Information Committees and cooperation in terms of nuclear power facilities (Journal of Laws of 2012, Item 861)which entered into force 11 August 2012;
38. Regulation of the Council of Ministers of 24 August 2012 on nuclear regulatory inspectors (Journal of Laws of 2012, Item 1014), which entered into force 28 September 2012;
39. Regulation of the Council of Ministers of 10 August 2012 on positions important for nuclear safety and radiological protection and radiation protection officers (Journal of Laws of 2012, Item 1022), which entered into force 9 September 2012 superseding Regulation of the Council of Ministers of 18 January 2005 on positions which are important for ensuring nuclear safety and radiological protection and radiation protection officers (Journal of Laws, No 21, Item 173);
40. Regulation of the Council of Ministers of 10 August 2012 on activities important for nuclear safety and radiological protection in an organizational unit conducting activity which consists in commissioning, operations or decommissioning of a nuclear power plant (Journal of Laws of 2012, Item 1024), which entered into force on 2 October 2012;
41. Regulation of the Council of Ministers of 10 August 2012 on the detailed scope of assessment with regard to land intended for the site of a nuclear facility, cases excluding land to be considered eligible for the site of a nuclear facility and on requirements concerning siting report for a nuclear facility (Journal of Laws of 2012, Item 1025), which entered into force on 2 October 2012;
42. Regulation of the Council of Ministers of 31 August 2012 on the scope and method for the performance of safety analyses prior to the submission of an application requesting the issue of a license for the construction of a nuclear facility and the scope of the preliminary safety report for a nuclear facility (Journal of Laws of 2012, Item 1043), which entered into force on 5 October 2012;
43. Regulation of the Council of Ministers of 31 August 2012 on the nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design (Journal of Laws of 2012, Item 1048), which entered into force on 5 October 2012;
44. Regulation of the Council of Ministers of 10 October 2012 on the amount of payment for coverage of the costs of spent nuclear fuel and radioactive waste management and the costs of nuclear power plant decommissioning performed by an organizational entity which received license for the operation of a nuclear power plant (Journal of Laws of 2012, Item 1213); which entered into force on 21 November 2012;
45. Regulation of the Minister of Health of 21 December 2012 on granting authorizations of a radiation protection officer in laboratories using X-ray devices for medical purposes (Journal of Laws of 2012, Item 1534) which entered into force 1 January 2013.

46. Regulation of the Council of Ministers of 11 February 2013 on nuclear safety and radiological protection requirements for the stage of decommissioning nuclear facilities and the contents of report on decommissioning of a nuclear facility (Journal of Laws of 2013, Item 270); which entered into force on 14 March 2013;
47. Regulation of the Council of Ministers of 11 February 2013 on requirements for decommissioning and operations of nuclear facilities (Journal of Laws of 2013, Item 281); which entered into force on 15 March 2013;

Major internal acts of law

3. Ordinance No 1 of the Minister of Economy of 16 January 2002 on establishing the statute of the public utility enterprise under the name of 'The Radioactive Waste Management Plant' with its registered seat in Otwock-Świerk,
4. Ordinance No 4 of the Minister of Interior and Administration of 26 March 2002 on the enforcement of the provisions of the Atomic Law Act in the Police, State Fire Service, Border Guard and organizational entities reporting to the minister competent for interior matters (Official Journal of Ministry of Interior and Administration No 3, Item 7),
5. Ordinance No 51/MON of the Minister of National Defence of 17 September 2003 on the enforcement of provisions of the Atomic Law at organizational entities reporting to the Minister of National Defence (Official Journal of Ministry of National Defence, No 15, Item 161),
6. Ordinance No 69 of the Minister of the Environment of 3 November 2011 on granting the statute of the National Atomic Energy Agency – PAA (Official Journal of the Minister of Environment and Chief Environmental Protection Inspector No 4 Item 66).

APPENDIX NO 2

LIST OF MAJOR ACTS OF INTERNATIONAL AND EUROPEAN LAW

International agreements

1. Treaty Establishing the European Atomic Energy Community (EURATOM)
2. Treaty on the Non-Proliferation of Nuclear Weapons done at Moscow, Washington and London on 1 July 1968 (Journal of Laws of 1970, No. 8, Item 60) (INFCIRC/140), and resulting acts:
   - Agreement between the Kingdom of Belgium, the Kingdom of Denmark, the Federal Republic of Germany, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of Netherlands, the European Atomic Energy Community and the International Atomic Energy Agency, in implementation of Article III, (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons, signed in Brussels on 5 April 1973 (Journal of Laws of 2007, No. 218, Item 1617);
   - Additional Protocol to the Agreement between the Republic of Austria, the Kingdom of Belgium, the Kingdom of Denmark, the Republic of Finland, the Federal Republic of Germany, the Hellenic Republic, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of Netherlands, the Portuguese Republic, the Kingdom of Spain, the Kingdom of Sweden, the European Atomic Energy Community and the International Atomic Energy Agency, in implementation of Article III (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons, Vienna, 22 September 1998 (Journal of Laws of 2007, No. 156, Item 1096);
3. Convention on Early Notification of a Nuclear Accident, done at Vienna on 26 September 1986 (Journal of Laws of 1998, No. 31, Item 216),
4. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, done at Vienna on 26 September 1986 (Journal of Laws of 1998, No. 31, Item 218),
5. Convention on Nuclear Safety, done at Vienna on 20 September 1994 (Journal of Laws of 1997, No. 42, Item 262),
6. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, done at Vienna on 5 September 1997 (Journal of Laws of 2002, No. 202, Item 1704),
7. Convention on the Physical Protection of Nuclear Material, including annexes I and II, open for singing in Vienna and New York on 3 March 1980 (Journal of Laws of 1989, No. 17, Item 93),
8. Vienna Convention on Civil Liability for Nuclear Damage, done at Vienna on 21 May 1963 (Journal of Laws of 1990, No. 63, Item 370),
9. Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (on liability for nuclear damage), done at Vienna on 21 September 1988 (Journal of Laws of 1994, No. 129, Item 633),
10. Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage done at Vienna on 12 September 1997 (Journal of Laws of 2011, No 4, Item 9).

Selected acts of the European Community law

1. Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers resulting from ionizing radiation (OJ L 159 of 29.06.1996, p. 1; OJ Polish version, chap. 5, vol. 2, p. 291) [1],
2. Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of radiological emergency (OJ L 357 of 07.12.1989, p. 31; OJ Polish version, chap. 15, vol. 1, p. 366) [2],
3. Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas (OJ L 349 of 13.12.1990, p. 21, as amended, OJ Polish version, chap. 5, vol. 1, p. 405, as amended) [3],
4. Council Directive 97/43/Eurtom of 30 June 1997 on health protection of individuals against the dangers of ionizing radiation in relation to medical exposure and repealing directive 84/466/EURATOM (OJ L 180 of 09.07.1997, p. 22, as amended; OJ Polish version, chap. 15, vol. 3, p. 332, as amended) [4],
5. Council Directive 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and radioactive waste (OJ L 346 of 31.12.2003, p. 57; OJ Polish version, chap. 15, vol. 7, p. 694) [5],
6. Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel (OJ L 337 of 05.12.2006, p. 21),

[1] In accordance with Article 107 of the Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure and repealing directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom i 2003/122/Euratom (O. J. EC L 13 of 17 January 2014, p. 1), this directive is repealed from 6 February 2018.

[2] In accordance with Article 107 of the Council Directive 2013/59/EURATOM, this directive is repealed from 6 February 2018

[3] In accordance with Article 107 of the Council Directive 2013/59/EURATOM, this directive is repealed from 6 February 2018

[4] In accordance with Article 107 of the Council Directive 2013/59/EURATOM, this directive is repealed from 6 February 2018

[5] In accordance with Article 107 of the Council Directive 2013/59/EURATOM, this directive is repealed from 6 February 2018.

7. Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (OJ L 172 of 02.07.2009, p. 18; OJ L 260 of 03.10.2009, p. 40),
8. Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (OJ L 199 of 02.08.2011, p. 48),
9. Council Regulation (Euratom) No 3954/87 of 22 December 1987 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feedingstuffs following a nuclear accident or any other case of radiological emergency (OJ L 371 of 30.12.1987, p. 11, with later amendments; OJ Polish version, chap. 15, vol. 1, p. 333 with later amendments),
10. Commission Regulation (EURATOM) No 944/89 of 12 April 1989 laying down maximum permitted levels of radioactive contamination in minor foodstuffs following a nuclear accident or any other case of radiological emergency (OJ L 101 of 13.04.1989, p. 17; OJ Polish version, chap. 15, vol. 1, p. 347),
11. Council Regulation (EEC) No 2219/89 of 18 July 1989 on the special conditions for exporting foodstuffs and feedingstuffs following a nuclear accident or any other case of radiological emergency (OJ L 211 of 22.07.1989, p. 4; OJ Polish version, chap. 11, vol. 16, p. 342),
12. Commission Regulation 770/90/EURATOM of 29 March 1990 laying down maximum permitted levels of radioactive contamination of feedingstuffs following a nuclear accident or any other case of radiological emergency (OJ L 83 of 30.03.90 p. 78, OJ Polish version, chap. 15, vol. 1, p. 379),
13. Council Regulation (EURATOM) No 1493/93 of 8 June 1993 on shipments of radioactive substances between Member States (OJ L 148 of 19.06.1993, p. 1; OJ Polish version, chap. 12, vol. 1, p. 155),
14. Commission Regulation (EURATOM) No 302/2005 of 8 February 2005 on the application of EURATOM safeguards (OJ L 54 of 28.02.2005, p. 1),
15. Commission Regulation (EC) No 1635/2006 of 6 November 2006 laying down detailed rules for the application of Council Regulation (EEC) No 737/90 on the conditions governing imports of agricultural products originating in third countries following the accident at the Chernobyl nuclear power-station (OJ L 306 of 07.11.2006, p. 3),
16. Council Regulation (EC) No 733/2008 of 15 July 2008 on the conditions governing imports of agricultural products originating in third countries following the accident at the Chernobyl nuclear power station (OJ L 201 of 30.07.2007, p. 1),
17. Commission Implementing Regulation (EU) No 284/2012 of 29 March 2012 imposing special conditions governing the import of feed and food originating in or consigned from Japan following the accident at the Fukushima nuclear power station and repealing Implementing Regulation (EU) No 961/2011, (OJ L 92 of 30.03.2012, p. 16),
18. Council Decision of 14 December 1987 on Community arrangements for the early exchange of information in the event of a radiological emergency (87/600/Euratom), (OJ L 211 of 22.07.1989, p. 4; OJ Polish version, chap. 11, vol. 16, p. 342),
19. Commission Decision of 5 March 2008 establishing the standard document for the supervision and control of shipments of radioactive waste and spent fuel referred to in Council Directive 2006/117/Euratom (2008/312/Euratom) (OJ L 107 of 17.04.2008, p. 32).


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