NATIONAL
ATOMIC ENERGY
AGENCY

NATIONAL REPORT OF POLAND
ON COMPLIANCE WITH THE OBLIGATIONS
OF THE CONVENTION ON NUCLEAR SAFETY

Polish 7th national report as referred
To in Article 5 of the Convention on Nuclear Safety

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1. Introduction

This report has been prepared, according to the guidelines established by the Contracting Parties under Article 22, to fulfill the obligations of the Article 5 of the Convention on Nuclear Safety (CNS), signed by Poland on 20th September 1994 in Vienna and ratified by the President of the Republic of Poland on 10th May 1995. Present Report is the seventh one, following national reports issued in September 1998, October 2001, September 2004, September 2007, August 2010 and August 2013. Previous reports were presented during Review Meetings of the Contracting Parties of the Convention on Nuclear Safety held in Vienna in 1999, 2002, 2005, 2008, 2011 and 2014. Moreover in May 2012 Poland prepared special report describing "post-Fukushima" actions which was presented during 2nd CNS Extraordinary Meeting held in Vienna in August 2012.

Although **Poland is a contracting party without nuclear installations in the sense of the Article 2(i) of the Convention**, in the current report as well as in the previous ones, information regarding application of provisions of the Convention for Polish nuclear installations (research reactor and spent fuel storages) is presented. Obviously compliance with all articles referring to establishment, functioning and independence of the Regulatory Body (which in Polish case is the National Atomic Energy Agency - PAA) is also described. Moreover taking into consideration governmental decision on embarking on nuclear power extensive development of Polish legal framework was performed over last couple of years resulting in amendments of Atomic Law (Journal of Laws of 2014, item 1512, as amended, latest amendment in 2016) and issuing a number of Council of Ministers regulations establishing more detailed safety requirements. This report presents current legal status of Polish regulatory framework but it must be taken into account that most of the newly introduced safety requirements (especially those referring to siting and design requirements) have not yet been used in practice.

During the 6th review meeting no recommendations were given to Poland in reference to our current nuclear program however four challenges and two suggestions were identified in connection with future plans of introducing nuclear power:

Challenges:

1. PAA should develop a strategy for attracting and retaining high quality staff
2. PAA should adopt an integrated management system
3. Poland should incorporate Fukushima lessons in the new nuclear program
4. Poland should Continue working in the refinement of the Polish Nuclear Power Program in areas such as:
   - identifying site and tender technology
   - obtaining all required licenses and approvals
   - obtaining building permits
   - construct and commission

Suggestions:

1. Since Poland is actively pursuing constructing new NPPs, more detailed information on the implementation of the lessons learned from Fukushima should be incorporated in the National Report for the 7th CNS Review Meeting

2. Poland was encouraged to consider establishing a relationship with the regulator of the vendor country early in the process. This has been found to be useful in other embarking countries.

Abovementioned challenges and suggestions has been very seriously taken by the Polish government and PAA itself. Results of activities focused on implementing challenge 1 and 2 are described in subsections 8.1.6, 8.1.8. Incorporation of Fukushima Lessons in Polish Nuclear Power Programme (challenge 3 and suggestion 1) is presented mostly as citing appropriate legal requirements in relevant articles: 14, 16, 17, 18. Subsection *18.5. Provisions concerning Fukushima Daiichi accident lessons learned* was created to show compliance with lessons listed in The Fukushima Daiichi Accident Report by the IAEA Director General. Information about actions taken by Government and future operator PGE EJ1 in regard to Polish Nuclear Power Programme - challenge 4 - are presented in Annex no. 2. Implementation of suggestion 2 is discussed in subsection 8.1.10.

President of 7th CNS meeting urged all Member States to report on five challenges identified at 6th review meeting and documented in Summary Report as well as to report on means of implementation of Vienna Declaration on Nuclear Safety. Challenges and Vienna Declaration principles with relevant sections and subsections are presented below:

1. Challenge 1 – How to minimize gaps between Contracting Parties' safety improvements? – refer to subsection 14.3
2. Challenge 2 – How to achieve harmonized emergency plans and response measures? – refer to article 16
3. Challenge 3 – How to make better use of operating and regulatory experience and international peer review services? – refer to subsection 19.7
4. Challenge 4 - How to improve regulators' independence, safety culture, transparency and openness? – refer to subsection 8.1.9 and article 10
5. Challenge 5 - How to engage all countries to commit and participate in international cooperation? – refer to summary
6. Principles 1 and 3 of Vienna Declaration – refer to subsections 17.1, 18.1 and article 19
7. Principle 2 of Vienna Declaration – refer to subsection 14.1

Poland is actively participating in international cooperation and in order to improve preparation for introduction of Nuclear Power Poland hosted INIR and IRRS missions in 2013, IPPAS mission and INIR follow-up mission in 2016.

IRRS mission has been conducted in Poland in Spring 2013. Team of international senior safety experts led by Mr. Robert Lewis (USA, NRC) and Mr. Karol Janko (Slovak Republic, UJD) spent two weeks in Warsaw to review Poland's regulatory framework for nuclear and radiation safety and its effectiveness. The mission took place from 15 to 24 April 2013.

The IRRS review comparing the Poland regulatory framework for nuclear and radiation safety against the IAEA Safety Standards addressed **all facilities and activities regulated by PAA**, including research reactor, radioactive waste management facilities and radiation source facilities. In addition, the IRRS review addressed **preparations for the development of the nuclear power program** from the regulatory point of view.

On the basis of the **mission report** it is worth to mention that the IRRS review team observed several good practices including: introducing changes to the Atomic Law Act and regulations, including those related to decommissioning, at an early stage in the NPP program; leveraging the considerable experience of senior management of the PAA in regulatory issues, and personally mentoring new inspectors; broad public consultations concerning the development of regulations and laws with the institutions engaged in the Polish Nuclear Power Programme and the public; and PAA's proactive coordination approach with Poland's Office of Technical Inspection.

On the other hand the IRRS team identified expected growth of PAA over the next few years as an ongoing challenge for PAA's leadership, and source of complexities with regard to the planned regulation of nuclear power. The IRRS team offered several recommendations and suggestions on how to address these challenges. The team observed that the leadership of PAA is very engaged in operational activities, which given the current size of PAA program, has enabled a healthy focus on both safety issues and corporate governance. However in the future there will be increasing demands on PAA's management as PAA's programs expand. A further challenge relates to knowledge management issues, e.g., the retirement of many senior managers and staff having experience in Poland's prior nuclear power program.

In order to position PAA to address its growth and additional responsibilities, and to maintain its strong focus on safety for currently regulated facilities and activities, the IRRS team advised PAA to:

- Establish and frequently review the nexus between PAA's organizational goals and objectives, and resource planning (staffing and external support strategies);
- Consider strengthening and documenting PAA's management system; and
- Develop and strengthen internal guidance to document authorization processes, review and assessment, and inspection procedures.

Particular IRRS team findings (recommendations, suggestions and good practices) relevant to given article of the Convention are inserted in the text of report in appropriate subsections. IRRS mission final report as well as PAA action plan have been published on PAA website in subsection about IRRS mission: http://www.paa.gov.pl/strona-194-irrs_review.html

Most of the actions which were taken as a result of action plan following IRRS mission are described in answer to article 8, as most of them were directed to PAA human resources development, management system, communication with public, use of external experts etc. Some other actions are also described in subsections 14.1, 16 and 19.7.

The 2013 INIR mission had provided five recommendations and six suggestions for concluding Phase 1 of nuclear infrastructure development. INIR follow-up mission from 21 to 23 of June 2016 assessed Poland's progress in its infrastructure development activities concluding that **Poland has implemented all the recommendations and suggestions** of a 2013 INIR mission. The main achievements identified by the expert team were:

- The Council of Ministers adopted the updated Polish Nuclear Power Programme in 2014, which shows Poland's commitment to safety, security and non-proliferation and also includes policies on radiological protection, energy security and waste management;

- Poland has facilitated and strengthened the coordination among the main stakeholders, which are the Ministry of Energy, the regulatory body PAA and the future owner/operator, PGE Polska Grupa Energetyczna S.A., with due respect to the regulatory body's independence;
- Poland has invested efforts and financial resources in human resource development, training and equipment purchase to identify the needs of the main stakeholders and to strengthen emergency preparedness and response;
- Poland has enhanced its mechanisms so that all entities dedicated to safeguards and handling of nuclear materials understand their obligations under the comprehensive safeguards agreement and the additional protocol;
- A revision of the Atomic Law, addressing security and non-proliferation issues, has been prepared and submitted for legislative work by the parliament.

Poland's INIR mission report is publicly available on IAEA website: https://www.iaea.org/NuclearPower/Infrastructure/INIR.html

Although nuclear security is outside the scope of CNS it is worth to mention that from 22nd February until 4th March 2016 the IAEA conducted the two-week International Physical Protection Advisory Service (IPPAS) mission at the request of the Government of Poland. The mission reviewed Poland's nuclear security-related legislative and regulatory framework for nuclear material and associated facilities, as well as security arrangements applied to the transport of nuclear material. In addition, the team reviewed physical protection systems at the Maria research reactor and the Radioactive Waste Management Plant located in Otwock-Świerk, as well as at the National Radioactive Waste Repository in Różan. Findings identified by team members will serve as basis for action plan which will lead to enhancement of Polish nuclear security regime.

Important Notice: All information presented in this report are up to date as of 1 July 2016 (unless otherwise stated in the text)

2. COMPLIANCE WITH ARTICLES 6 – 19

Article 6. Existing nuclear installations

Each Contracting Party shall take the appropriate steps to ensure that the safety of nuclear installations existing at the time the Convention enters into force for that Contracting Party is reviewed as soon as possible. When necessary in the context of this Convention, the Contracting Party shall ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation. If such upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible. The timing of the shut-down may take into account the whole energy context and possible alternatives as well as the social, environmental and economic impact..

At the moment Poland has no nuclear installations according to definition in Article 2(i) of the Convention. There is neither NPP in operation nor in construction in Poland. The one planned in Żarnowiec (construction of two units of WWER-440/V213, started in 1985, and terminated in 1990) was finally cancelled in the year 1991. At present time Poland has only one research reactor in operation which recently has been given a new 10-year licence for operation (the other reactors, operated in the past, had been either permanently shut down or decommissioned - see **Annex no.1** for details). The licensee prepared new Safety Analysis Report which was carefully assessed by PAA in first part of 2015.

Regarding future nuclear power programme *Resolution no. 4/2009 of the Council of Ministers of 13 January 2009 on nuclear power development activities* stated among others that:

- Nuclear Power Program for Poland will be prepared and implemented (after public discussion and government's approval);
- Government Commissioner for Nuclear Power in Poland will prepare Nuclear Power Program for Poland (1st draft of this document was published in August 2010);
- PGE Polska Grupa Energetyczna SA (Polish Energy Group SA) will play a leading role in the implementation of Nuclear Power Program for Poland;
- At least 2 nuclear power plants will be built; first NPP will be commissioned in 2025.

On 28 January 2014 the Council of Ministers passed a resolution regarding the Polish Nuclear Power Program, developed by the Ministry of Economy. The Program sets forth a list of tasks ensuring safe use of nuclear power in Poland. **Annex no. 2** gives information on the implementation of nuclear power in Poland prepared by Ministry of Energy for the needs of this national report.

In December 2015 the Ministry of Economy, acting previously as a Nuclear Energy Programme Implementing Organisation, has been transformed into the Ministry of Energy and Ministry of Economic Development.

All competences in the field of nuclear power possessed previously by the Ministry of Economy has been transferred into the newly created Ministry of Energy. The main responsibility of the Ministry of Energy in this field is to plan and coordinate the implementation of the State's strategy for development of nuclear power in Poland. Other tasks of this Ministry cover issues like management of mineral deposits.

Ministry of Economic Development is responsible for areas covering: management of EU funds, national economic development policy, public-private partnership projects and international economic cooperation.

Principles of Vienna Declaration will be followed and implemented during Polish Nuclear Power Programme, nevertheless main provisions of law that already fulfil those principles are discussed in articles 14, 17, 18 and 19. As there are no nuclear installations in operation in Poland according to CNS definition, so there is no significant experience in this field the answer to the challenge concerning safety improvements can be found in article 14 and mainly apply to safety assessment and verification.

Article 7. Legislative and regulatory framework

Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations. The legislative and regulatory framework shall provide for:

i. the establishment of applicable national safety requirements and regulations;
ii. a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a licence:
iii. a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licences;
iv. the enforcement of applicable regulations and of the terms of licences, including suspension, modification or revocation.

7.1. National safety requirements and regulations

The issues of nuclear safety of nuclear facilities are regulated in the Act of 29 November 2000 "*Atomic Law*" (Journal of Laws of 2014, item 1512, as amended). The Atomic Law and its supporting regulations contain provisions that regulate the requirements related to:

1. radiological protection (of staff, society and patients);
2. nuclear and radiation safety, including
   - safety of nuclear facilities,
   - proceeding with nuclear material and sources of ionising radiation,
   - related to radioactive waste and spent nuclear fuel,
   - related to transport of nuclear material and radioactive sources, and spent nuclear fuel and radioactive waste,
   - assessment of radiation level and emergency actions,
3. physical protection (of nuclear facilities and nuclear material);
4. non-proliferation of nuclear material and technology (safeguards);
5. civil liability for nuclear damage.

Annexes no. 3 & 4 give summary of entire Atomic law and complete list of supporting regulations issued by Council of Ministers, Minister of Health, Minister of Internal Affairs, Minister of Finances and Minister of Environment.

The act incorporates a number of international regulations, such as:

- Convention on Early Notification of a Nuclear Accident, Vienna, 26 September 1986 (Journal of Laws of 1998, No. 31, item 216) (INFCIRC/335);
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Vienna, 26 September 1986 (Journal of Laws of 1998, No. 31, item 218) (INFCIRC/336);
- Convention on Nuclear Safety, Vienna, 20 September 1994 (Journal of Laws of 1997, No. 42, item 262) (INFCIRC/449);

- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Vienna, 5 September 1997 (Journal of Laws of 2002, No. 202, item 1704) (INFCIRC/546);
- 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)(INFCIRC/274/Rev.1);
- Amendment to Convention on Physical Protection of Nuclear Material, Vienna, 8 July 2005 (GOV/INF/2005/10-GC(49)/INF/6);
- Treaty on the Non-Proliferation of Nuclear Weapons, Moscow, Washington, London, 1 July 1968 (Dz. U. 1970, No. 8, item 60) (INFCIRC/140), and resulting acts:
  - Agreement between the Kingdom of Belgium, Kingdom of Denmark, Federal Republic of Germany, Ireland, Republic of Italy, Great Duchy of Luxembourg, Kingdom of Netherlands, European Atomic Energy Community and International Atomic Energy Agency, on Implementation of Article III, Sections 1 and 4, of the Treaty on Non-Proliferation of Nuclear Weapons, Brussels, 5 April 1973 (Dz. U. 2007, No. 218, item 1617);
  - Additional Protocol to the Agreement between the Republic of Austria, Kingdom of Belgium, Republic of Finland, Kingdom of Denmark, Federal Republic of Germany, Republic of Greece, Ireland, Republic of Italy, Great Duchy of Luxembourg, Kingdom of Netherlands, Republic of Portugal, Kingdom of Spain, Kingdom of Sweden, European Atomic Energy Community and International Atomic Energy Agency, on Implementation of Article III, Sections 1 and 4, of the Treaty on Non-Proliferation of Nuclear Weapons, Vienna, 22 September 1998 (Dz. U. 2007, No. 156, item 1096);
- Vienna Convention on Civil Liability for Nuclear Damage, Vienna, 21 May 1963 (Journal of Laws of 1990, No. 63, item 370)(INFCIRC/500);
- Joint Protocol Relating to the Application of the Vienna Convention and Paris Convention (on liability for nuclear damage), Vienna, 21 September 1988 (Journal of Laws of 1994, No. 129, item 633) (INFCIRC/402);
- Protocol Amending the Vienna Convention on Civil Liability for Nuclear Damage (Journal of Laws of 2011, No. 4, item 9) (INFCIRC/556).

In addition, the Republic of Poland is a party to the Treaty Establishing the European Atomic Energy Community (Euratom). Based on the treaty, a number of directives have been adopted and implemented in the Polish legal system, including but not limited to:

- 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 ionising radiation (OJ L 159 of 29.06.1996, page 1; OJ Polish version, chapter 5, vol. 2, page 291),
- 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, page 31; OJ Polish version, chapter 15, vol. 1, page 366),
- Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionising radiation during their activities in controlled areas (OJ L 349 of 13.12.1990, page 21, as amended, OJ Polish version, chapter 5, vol. 1, page 405, as amended).

- 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 directive 84/466/Euratom (OJ L 180 of 09.07.1997, page 22, as amended; OJ Polish version, chapter 15, vol. 3, page 332, as amended).
- Council Directive 2003/122/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, page 21),
- Council Directive 2006/117/Euratom of 22 May 2003 r. on the control of high-activity sealed radioactive sources and radioactive waste (OJ L 346 of 31.12.2003, page 57; OJ Polish version, chapter 15, vol. 7, page 694),
- Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (OJ L 172 of 2.7.2009, page 18, and OJ L 260 of 3.10.2009, page 40),
- 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 2.8.2011, page 48),
- Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (OJ L 13, 17.1.2014, p. 1–73) – during the implementation process
- Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations (OJ L 219, 25.7.2014, p. 42-48) – during the implementation process.

7.2. Licensing system for nuclear installations

The Act of Atomic Law requires (Art.4.1 p.2) a separate licence for construction, commissioning, operation and decommissioning of any nuclear installation, issued by the President of PAA. The requirements, concerning documentation to be submitted by an applicant and the procedure to be followed to obtain an appropriate licence, have been established in the *Regulation of the Council of Ministers of 30 June 2015 on the documents required for licence application submitted for the practices that involve or could involve radiation exposure or for the notification of such practices* (OJ item 1355). The general procedure of licensing nuclear installation (including power and research reactors, radioactive waste and spent fuel management facilities), in the phases of construction, commissioning, operation decommissioning or closure is described below.

Applications for a licence or for an official opinion related to a nuclear installation must be submitted to PAA President. It applies also, with some modifications, to the stage of siting, which does not require PAA President's licence, but only official opinion thereof (see reporting on Article 17 for details). Before applying for a licence, the investor may apply to the PAA President for a general assessment of the planned organizational and technical solutions and draft versions of documents to be submitted along with the application. In case of the construction licence, the application with an abbreviated safety report is immediately published in the Public Information Bulletin. Members of the public have the right to make submissions and observations within 21 days.

Draft licences and opinions are prepared by the PAA Department for Nuclear Safety, on the basis of review and assessment of safety documentation supplied by the applicant and also on the basis of inspections performed by PAA regulatory inspectors in applicant's premises if necessary. The reports from each of inspections, performed by PAA inspectors in nuclear installations are submitted to the PAA President. While performing the review and assessment tasks, PAA may use external experts or consultant organizations, but only on the condition that those experts or organizations are free from conflict of interest, i.e. they are not employed by or otherwise dependent on applicant/licensee or shall be excluded from participation in the proceedings by virtue of law. A draft licence or opinion is submitted to the PAA President for approval and for the official granting to the applicant. Before that, the PAA President has to apply to the Council for Nuclear Safety and Radiological Protection to state its opinion on the draft licence. Within one month from receiving this opinion, the PAA President sends the draft licence to the applicant, who can submit his reservations within another month.

In the siting stage of a nuclear installation (including NPPs, research reactors and spent fuel storages), the authority competent to issue the decision on terms of building and area development conditions on the site of a future nuclear facility, issues this decision after obtaining the PAA President's positive opinion on the matters concerning nuclear safety and radiological protection (Art.36). The "siting report" developed by the applicant is reviewed by the PAA President in the course of the proceedings for granting a construction licence (art. 35b s.3). Before applying for a nuclear facility construction licence, the investor must apply to the PAA President for a preliminary assessment of the site of a future nuclear power plant or facility that serves for the purpose of nuclear energy and can apply for a preliminary assessment of the site of a future facility other than nuclear power plant or facility that serves for the purpose of nuclear energy(Art. 36a).

Apart from issuing licences, the PAA President approves some documents important for nuclear safety of nuclear installations:

- documentation of safety classification of nuclear installation's systems, structures and components (Art. 36j s.3),
- documentation of integrated management system of the organizational entity conducting activities involving exposure and consisting in construction, commissioning, operation or decommissioning of nuclear facilities (Art. 36k s.3),
- nuclear facility commissioning programme (Art. 37a s.2),
- nuclear facility commissioning report (Art. 37b s.2),
- detailed periodical safety review plan (Art. 37e s.3),
- periodical safety review report (Art. 37e s.5),
- nuclear facility decommissioning programme (Art. 38b),
- nuclear facility decommissioning report (Art. 38c s.1).

Modernization of any nuclear facility system, structure or component important for the nuclear safety and radiological protection, and each reactor start-up following such modernization or fuel load requires a written consent of the Agency's President (Art. 37d).

The authorization process applies also to the staff of a nuclear facility. According to Art.12 of the Atomic Law Act in any facility performing activities involving radiation exposure, the position important for ensuring nuclear safety and radiological protection have to be occupied exclusively by an individual possessing appropriate authorization issued by the PAA President. Licences for such positions are granted on the basis of the qualification process, established by the Council Ministers' Regulation, issued pursuant to Art. 12b of the

Act, and of the exams performed by the Commission for Qualification of Staff for the Posts Important for Nuclear and Radiation Safety, appointed by the PAA President. The Atomic Law provides also for a separate authorization (on similar conditions) of staff performing activities important from the viewpoint of nuclear safety and radiological protection in any organizational entity conducting activities involving exposure and consisting in commissioning, operation or decommissioning of a nuclear power plant (Articles 12c – 12e of the Atomic Law).

Moreover, according to Art.11 of the Act, employees of a nuclear facility have to be duly trained, according to the program prepared by the facility manager, to possess and maintain the knowledge of nuclear safety and radiological protection regulations appropriate for their positions, as well as appropriate skills and qualifications. In nuclear power plants the short and long-term training plans have also to be approved by the PAA President (Article 11b of the Atomic Law).

7.3. Prohibition of the operation without a licence

According to the Art. 2 of the Atomic Law Act, activities involving real and potential exposures to ionising radiation shall be permitted after undertaking the measures defined in appropriate regulations, aimed at ensuring the safety and protection of human life and health, as well as protection of property and the environment.

The Art. 4 s.1 p.2 requires that each subsequent stage, i.e. construction, commissioning, operation and decommissioning, requires separate licences, granted by the PAA President after ascertaining that the requirements and conditions relevant to radiation and nuclear safety at the given stage were met and fulfilled. Pursuant to Art. 34, no activities involving exposure and consisting in construction, commissioning, operation or decommissioning of nuclear facilities can be conducted by an organizational entity which fails to comply with the requirements concerning nuclear safety, radiological protection, physical protection and nuclear material safeguards. It means, in particular, that the operation of a nuclear installation without a licence is prohibited.

The applicant/licensee must submit at each of the stages, together with his application for the licence to the PAA President, a proper safety documentation for the nuclear facility. Results of the review and assessment of this documentation provide the regulatory body with the basis for preparation of a licence with relevant requirements and conditions.

The head of the organisational entity, who without the required licence, or in violation of the conditions stipulated therein , engages in the construction, commissioning, operation and decommissioning of a nuclear facility, is subject to fine (Art.123), imposed by the PAA President.

7.4. Regulatory inspections and assessment of nuclear installation

According to the Act of Atomic Law, Regulatory Body responsibilities include in particular conducting inspections in nuclear facilities and in other facilities possessing (or involved in activities with) nuclear materials, ionizing radiation sources, radioactive waste and spent nuclear fuel (Art. 64 s.4 p.2). PAA President performs regulatory tasks through nuclear regulatory inspectors. Nuclear regulatory bodies can carry out (Art. 65a.):

1. periodical inspections – as per inspection plan approved by PAA President;

2. ad-hoc inspections – whenever circumstances arise which may have a substantial impact on the nuclear safety and radiological protection at a nuclear facility subject to inspection;
3. continuous inspections - at nuclear power plants by virtue of permanent authorization.

In the context of conducted inspection the regulatory Inspectors are entitled to (Art.66 s.1):

- access at any time to the means of transport and to the sites, facilities and premises of organizational units, where nuclear materials, ionizing radiation sources, radioactive waste or spent nuclear fuel are produced, used, stored, disposed or transported (in particular – to nuclear installations),
- access to the documents and other data carriers relevant for nuclear safety and radiological protection in inspected organizational unit,
- request copies of the documents and data carriers mentioned above to be produced or provided,
- check whether the activity / practice referred to in Art. 4 s.1 of the Atomic Law (subject to obtain licence or to be notified to the regulatory body) is conducted in compliance with the nuclear safety and radiological protection regulations and with the requirements and conditions specified in the licence,
- conduct, if necessary, independent technical and dosimetric measurements,
- request written or oral information, when it is necessary for clarifying a concern,
- collect samples for laboratory tests,
- inspect the site, facilities, premises and installations of the inspected organizational entity and its transport vehicles,
- record the processes and results of inspection using audio-visual recording systems,
- secure and request securing (confirming security) documents and other proofs,
- during inspections of nuclear power plants – to request the assistance of expert laboratories and organizations authorized by the PAA President, and during inspections of other organizational entities – to request the assistance of experts, specialists and laboratories.

The head of the organisational entity being inspected is obliged (Art. 66 s.2) to take all necessary measures to allow the nuclear regulatory authorities to carry out the inspection. The employees of the unit being inspected have to give the inspectors oral or written explanations on the questions related to the subject of inspection. Should an inspection reveal a direct threat to nuclear safety or radiation protection, the President of PAA nuclear regulatory inspectors are obliged by Art. 68 of the Atomic Law Act to give immediately applicable injunctions or interdictions to impose emergency measures designed to eliminate the danger.

In the performing regulatory inspection also the international guidelines and experience from former inspections of nuclear facilities are taken into account. The primary purpose of regulatory inspection is the independent determination of how the licensee complies with the general nuclear safety and radiation protection requirements, with the licence terms, additional regulatory requirements and good engineering practices; the inspection also is a check of the implementation of the quality assurance programme.

Radiological Protection Department and Nuclear Safety Department have specific procedures and instructions regarding regulatory inspections. Inspections need to be planned (excluding necessary ad-hoc inspections), authorized by the PAA's President, prepared by the leading inspector, proceeded following prepared instructions and properly documented. This process ensures the effectiveness of routine regulatory inspections. The programme and scope of such inspections is formulated prior to visiting the site, relevant procedures are evoked or, if necessary, prepared by the inspectors. The personnel designed to carry out each inspection is selected and notified beforehand to provide adequate time to become acquainted with applicable instructions and appropriate background material. Inspection need to be properly reported, which includes naming inspectors, informants, describing scope of the inspection, procedure and results of the inspection, issued orders, bans or recommendations and conclusions of the inspection. When it is necessary post-inspection notice shall be issued by the PAA President.

7.5. Enforcement provisions

The Act of Atomic Law gives regulatory body adequate powers to enforce compliance with safety requirements imposed by laws, regulations and licence conditions (Art. 5 s.5). According to its Art. 5 s.11 the PAA President may revoke a licence or modify it as needed. In particular Agency's President shall revoke a licence if nuclear safety and radiation protection requirements imposed by applicable regulations and of the terms of licence have not been fulfilled. Depending of regulatory assessment of situation the following enforcement actions can be undertaken:
(1) oral or written immediately applicable order (Art.68),
(2) issuance of a written order or a recommendation to the licensee (Art.68a, Art. 68b),
(3) ordering the licensee to curtail activities (Art.37b s.1, Art. 37c s.3),
(4) revoking the licence (Art.5 s.11),
(5) fines enforced by mean of administrative enforcement proceedings (Art.123),
(6) punishment by fine or detention (Art. 127).
(7) recommendation of prosecution through the courts of law.
The nuclear regulatory inspectors have been equipped by art.68 of the Atomic Law Act with the authority to take on-the-spot decisions.

Article 8. Regulatory body

1. Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.
2. Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.

8.1. Establishment of the regulatory body

8.1.1. Legal foundations and statue of the regulatory body

The President of the National Atomic Energy Agency (PAA) constitutes the central organ of the governmental administration, competent for nuclear safety and radiological protection. The activities of the President of National Atomic Energy Agency are regulated on

the basis on the Act of Parliament on the Atomic Law (article 110) and its secondary legislation. The President of the National Atomic Energy Agency as the central organ of public administration is independent in taking decisions with regard to tasks entrusted to him on the basis of the Atomic Law Act. Since 1 January 2002 the supervision over the PAA President has been exercised by the Minister competent for the environmental matters on the basis of Article 28, Section 3 of the Act of Parliament on Governmental Administration Departments of 4 September 1997 and article 109 section 4 of the Atomic Law. PAA President is appointed for indefinite period of time. The Agency's President is nominated and recalled by the Prime Minister (Art.109.2).

The Agency's President is executing his tasks through the National Atomic Energy Agency (PAA). The PAA's internal organization is determined by Order No 69 of the Minister of Environment of 3 November 2011 on Granting Statute to the National Atomic Energy Agency (pursuant to Article 113 Section 1 of the Atomic Law). This Order also determines organizational entities which are included in the PAA's structure and perform particular functions.

8.1.2. Mandate, mission and tasks

Mandate, authority and particular responsibilities of PAA are defined in the Chapter 13 of the Atomic Law Act. In accordance with the Article 110 of the Atomic Law the scope of activities of the Agency's President includes the tasks that involve ensuring national nuclear safety and radiological protection, in particular:

1) preparation of draft documents related to national policies involving nuclear safety and radiological protection, taking into account the programme 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 environment, including the issuance of decisions on licences and authorizations and other decisions, as provided in this Act,
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 connected with public communication, education and popularization, scientific, technical and legal information concerning nuclear safety and radiological protection, including activities consisting in providing the general public with information about ionizing radiation and its impact on human health and the environment and about feasible measures to be implemented in the event of radiation emergency – excluding the promotion of the use of ionizing radiation, and in particular, the promotion of nuclear power sector;

7) cooperation with governmental and local administration authorities in matters involving nuclear safety and radiological protection, and in matters concerning scientific research in 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) preparing opinions, for the purposes of governmental and local administration, concerning nuclear safety and radiological protection with regard to the proposed technical activities involving peaceful uses of atomic energy;
10) cooperation with suitable foreign national entities and international organizations within the scope stated herein;
11) developing the drafts of legal acts on the issues covered by this 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.

PAA's internal document entitled "Mission, Vision and Operational Strategy of the National Atomic Energy Agency" determines the objectives, requirements and efforts undertaken to ensure that any activity which might lead to ionising radiation exposure is handled in a manner safe for the staff and the society.

8.1.3. Authorities and responsibilities

The Atomic Law requires that **activities involving real and potential ionising radiation exposures** from man-made radioactive sources, nuclear materials, equipment generating ionizing radiation, radioactive waste and spent nuclear fuel, **are supervised** and **controlled** by the State and can be permitted on the condition of employing regulatory means for the safety and health and life protection of humans, and also for the protection of property and environment (Art.2). This includes the **obligation of obtaining an appropriate licence**, excluding the cases when such activities may be performed on the basis of notification or do not have to be licenced or notified according to the criteria established in the regulation of the Council of Ministers of 6 August 2002 (amended in 2004), based on the Article 6.1 of the Atomic Law.

Under the Atomic Law (Article 4), the following activities / practices involving exposures require a licence or notification (with reservation as above):

1) 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,
2) construction, commissioning, operation and decommissioning of nuclear facilities,
3) construction, operation, closure and decommissioning of radioactive waste repositories,
4) production, installation, use and maintenance of the equipment containing radioactive sources and trade in such devices;
5) commissioning and use of the equipment generating ionizing radiation;
6) commissioning of laboratories and workrooms using ionizing radiation sources, including X-ray laboratories;

7) intentional addition of radioactive substances in the processes of manufacturing consumer products and medical devices, medical devices for in-vitro diagnostics, equipment for medical devices, equipment for medical devices for in-vitro diagnostics, active medical devices as defined in Act of Parliament on Medical Devices of 20 May 2010 (Journal of Laws of the Republic of Poland 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;
8) intentional administration of radioactive substances to humans and animals, for the purposes of medical or veterinary diagnostics, therapy or research

According to Article 5, Articles 36-39 and Article 63 of the Atomic Law Act, legal authority to issue licences, binding opinions and to perform regulatory inspection of the siting, design, construction, commissioning, operation and decommissioning of nuclear installations in Poland is given to the President of the National Atomic Energy Agency.

The President of the National Atomic Energy Agency issues the licences and accepts the notifications related also to other activities / practices that are listed above, with only the following exceptions: the licences for commissioning and use of X-ray equipment for medical purposes[1] and for commissioning of the laboratories using such equipment are issued by the state regional sanitary inspector or – for organizational units subordinated or supervised by the Minister of National Defence, the commander of the military preventive medicine centre, or – for organizational units subordinated or supervised by the minister for internal affairs – the state sanitary inspector in the Ministry of Internal Affairs.

As a consequence of the above exceptions also the **supervision and control** in the area of nuclear safety and radiological protection over the activities / practices resulting in actual or potential ionizing radiation exposures of people and environment, are executed by (Art. 6.2):

1) **"regulatory bodies" (as defined below) – in the cases** when the licence is issued or notification accepted by the President of the Agency;
2) regional sanitary inspector, commander of the military preventive medicine centre or state sanitary inspector in the Ministry of Internal Affairs and Administration in the sphere of activities / practices licenced by these bodies.

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

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

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

- **issuing licences and other decisions** in issues related to the nuclear safety and radiological protection, according to the principles and methods established by the Act;
- **conducting inspections** in nuclear facilities and organizational units which possess nuclear materials, ionizing radiation sources, radioactive waste and spent nuclear fuel,

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

- **issuing on-the-spot orders** if during the inspection it is found that nuclear safety and radiological protection are endangered,

8.1.4. Organizational structure of the regulatory body

The current structure of the PAA (Fig. 1) is determined by :

1) Act of Parliament the Atomic Law
2) Order No 69 by the Minister of Environment of 3 November 2011 on Granting Statute to the National Atomic Energy Agency;
3) Order no 4 by the President of National Atomic Energy Agency of 4th November 2011 on Establishing Organizational Bylaws of the National Atomic Energy Agency.

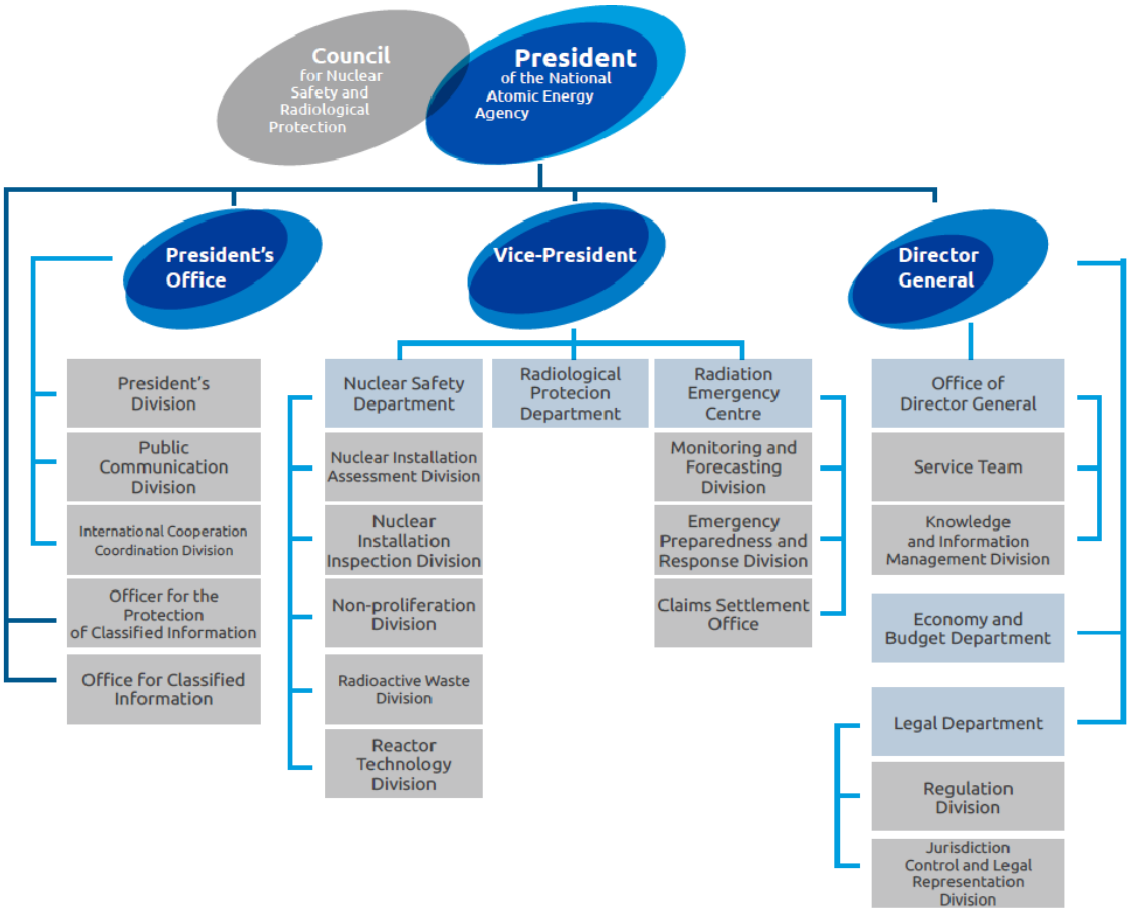

Fig. 1. Organizational Structure of National Atomic Energy Agency (as of 31 May 2016)

8.1.5. Human resources development

In 2009 PAA started self-assessment process which included an identification of the PAA needs in the Polish Nuclear Power Programme. As a result of this process, a document entitled "Guidelines for programme of necessary actions to be taken in the National Atomic Energy Agency" was prepared. The needs for recruitment and training of the staff were identified, so that PAA could meet the requirements of a nuclear regulatory body posed by the Polish Nuclear Power Program. In June 2011 the document entitled "A few notes on the tasks, organization, development and financial issues of the National Atomic Energy Agency

(Nuclear Regulatory Body) in the perspective of the construction of a nuclear power plant in Poland" summed up the results of analyses performed with regard to necessary organizational changes and development of the staff. These analyses took into account expected new tasks of the regulatory body relating to safety assessment of documentation submitted by an investor/operator in order to obtain opinion and licence of the PAA President at different stages of the nuclear power plant life. The identification of the need for additional staff was the result of comparison of the workforce of similar regulatory bodies in other states possessing a nuclear power sector with the number of the PAA staff and including budgetary capabilities. On the basis of this analysis the plans and costs of the staff development were identified till the end of 2014. According to those estimates the number of jobs in PAA should be increased by 39 new positions. The founds (called "specific provision") for hiring 39 employees were provided by the government. In January 2015 process of employment for those 39 positions was finished successfully. 23 new positions were created in Nuclear Safety Department, 6 in Radiation Emergency Centre, 4 in Radiological Protection Department, 3 in Legal Department, 2 in Office of Director General and 1 in President's Office.

Overall human resources changes during last 3 years (2014-2016) in departments mostly involved in regulatory work:

- Nuclear Safety Department – hired 10 people, 9 people left
- Radiological Protection Department – hired 4 people
- Radiation Emergency Centre – hired 8 people, 4 people left

„A few notes on the tasks, organization, development and financial issues of the National Atomic Energy Agency" document also contains financial issues showing an estimate of the PAA expenditures in next years. These expenditures include, among other things, costs connected with hiring new staff in the PAA. A need was also identified by Polish Nuclear Power Programme document (without presenting a financial estimate) to raise salaries in nuclear regulatory body in order to enhance its competitiveness in the labour market, which is necessary for the recruitment of new employees and for the retention of trained staff.

8.1.6. Competence development and maintenance

PAA management is very committed to develop competence of PAA staff. PAA has various agreements with regulatory bodies of countries with developed nuclear programmes like USA, France, United Kingdom or Republic of Korea. Thanks to this agreements and special funds both from Polish government and International Atomic Energy Agency a number of "on the job trainings" has been successfully completed by PAA staff. 2 nuclear inspector underwent training in England, 1 nuclear inspector in Korea, 1 nuclear inspector in USA, 1 candidate for nuclear inspector in France, 1 safety analyst in France and 1 in USA. The programme of "on the job trainings" is ongoing.

Recommendation from the IRRS mission's report on human resources development: "PAA should further develop a staffing plan for the current and future scope of regulatory functions that aligns the number of staff necessary and the essential knowledge, skills and abilities for them to implement the organizational goals and priorities. Such a staffing plan should leverage internal resources and external support."

Suggestion from the IRRS mission's report regarding attracting experienced staff: "The government should consider strategies and mechanisms to enable PAA to attract and retain high quality trained personnel."

At the 6th CNS Review Meeting Poland received 4 challenges and 2 suggestions. An answer to the challenge "PAA should develop a strategy for attracting and retaining high quality staff" is provided below. It is also an overview of actions taken to implement abovementioned suggestion and recommendation from IRRS mission.

The National Atomic Energy Agency (PAA) developing a hiring strategies allowing for the recruitment and retention in nuclear regulatory body highly skilled workers:

Hiring and retention of highly skilled workers is one of the key elements of the strategy to employ. The strategy in this area must include selected aspects of workstation design and take into account the personal circumstances of employees, their relationships, and even values.

The most important reasons for employee turnover CIPD include[2]: promotion outside the organization (50%), change of career (49%) and subsequently lack of development or career opportunities (37%), redundancy (36%), retirement (34%), level of pay (33%).

National Atomic Energy Agency developing a strategy to recruit and retain highly qualified employees in nuclear regulatory body, takes into account the following factors:

- position
- supervision and management,
- salary and benefits,
- training and professional development,
- career development,
- working conditions,
- ensuring equal opportunities,
- personal and family circumstances.

According to the document showing the status of the leading management control of the National Atomic Energy Agency in 2015 in terms of professional competence has been established that:

- managers and other employees should have the knowledge, skills and experience to effectively and efficiently carry out the tasks entrusted to,
- establish a procedure for recruitment and to include the controls necessary for an objective selection of the best candidate with the highest qualifications and competences,
- to establish appropriate and adequate scope of activities of employees,
- properly organized system of collecting information on training needs and their implementation,
- the creation of mechanisms to ensure the opportunity to develop professional skills of employees.

In addition to these activities, strategies to employ and retain highly qualified employees PAA is recommended to consult the following actions:

1. Improve the implementation of workers

[2] Annual Recruitment, retention and turnover survey, CIPD, 2009, p.31. Base size (n) = 715

- administrative arrangements,
- early feedback on the results and fit for the organization,
- capture success at an early stage,
- openness to new ideas.

2. The revision of the system of remuneration and bonuses to give employees a sense that their efforts are appreciated.
3. Systematic improving the competence of the Heads of human resource management, especially soft skills.
4. Increase employee engagement.
5. Offering coaching / mentoring / peer support schemes.
6. The reorganization of positions, so that people derive more satisfaction from work.
7. The change in the approach to the organization of career management.
8. Stepping branding as an employer among employees.

8.1.7. Financial resources

The President of PAA is an administrator of his own part of the state budget - "National Atomic Energy Agency." All fees and penalties provided for in the Atomic Law Act constitute income of the state budget and cannot be used directly for the maintenance of the nuclear regulatory body. Latest amendment of the Atomic Law Act established the maximum limit of expenditure from the state budget to finance the hiring of additional 39 employees in the PAA.

8.1.8. Management system

At the 6th CNS Review Meeting Poland received 4 challenges and 2 suggestions. An answer to the challenge “PAA should adopt an integrated management system” is provided below. It as well reflects actions taken as an implementation of 3 recommendations regarding management system from IRRS mission.

The management system of PAA has been developed following the requirements of the GS-R-3 standard (IAEA Safety Standards Series, No. **GS-R-3**, The Management System for Facilities and Activities, Vienna, 2006).

In the period from the 2014 to May 2016 the following areas of management system were developed:

- Process management
- MS documentation
- Assessment and improvement

Process management

In the area of process management the following actions were taken:

- Identification of processes
- Structuring processes including setting the hierarchy: (general processes -process groups, basic processes, sub-processes) and classifying into 3 groups: operational (core), management and administrative (supporting)
- Appointing and training of process owners

- Agreeing the process chart template encompassing all key information needed to manage the process according to the rules of process approach**.** Works on preparation of process charts for each basic process are in progress.

Management System documentation

The draft MS Manual describing all key elements of management system of PAA was elaborated. The manual sets general rules in all key areas of the MS.

The structure of documentation and role of particular types of documents was set and described in the Manual. The key documents – orders of the PAA President and Director General and procedures regulate the performance of tasks and processes. Process charts and further procedures are under development.

Assessment and improvement

PAA has amended its approaches in the area of self-assessment and risk management. Self-assessment is conducted once a year in form of people survey (with use of questionnaire) and management workshop. Self-assessment is based on standards of management control binding in Polish public sector.

The risk management covers identification, analysis and assessment of risks. The Risks register is created once a year and reviewed twice a year. For the risk classified as nonacceptable or serious the mitigating actions are planned and implemented.

At the beginning of 2016 the Management system review was conducted according to the requirements of GS-R-3 standard.
On 1-3 December 2015 PAA hosted the MAEA Expert mission on IMS. Experts reviewed the key elements of the system and gave comments and recommendations for its further development

8.1.9. Transparency and openness

Suggestions from IRRS's mission report on communication with public:

- *"The regulatory body PAA should prepare a strategy for increasing transparency with the public about risks and incidents in the different facilities and activities subject to its regulations."*
- *"PAA should consider clarifying the steps necessary in the licensing process to elaborate on the existing provisions of the ALA, and communicate them internally and externally"*

The approach towards transparency and openness has undergone a significant change since 2013 (time of IRRS mission). PAA has widen and depend its information policy, as well as added some new instruments for providing openness and transparency of the regulatory body. Information presented below not only reports the progress that PAA made since last review meeting in the area of transparency and openness but can also be treated as Poland's input into findings on one of the challenges from 6th Review Meeting of CNS Contracting Parties - "How to improve regulators' independence, safety culture, transparency and openness".

According the Atomic Law Act PAA the scope of activities of PAA includes the tasks that involve activities connected with public communication, education and popularization, scientific, technical and legal information concerning nuclear safety and radiological protection, including activities consisting in providing the general public with information about ionizing radiation and its impact on human health and the environment and about feasible measures to be implemented in the event of radiation emergency. PAA goes beyond the legal requirements and has taken a proactive approach towards both informing the public and understanding its needs.

Ensuring effective and transparent communication with stakeholders is one of four strategic objectives of PAA, which marks the importance of the regulator's transparency and openness in communication with the public

In 2014 the *National Atomic Energy Agency Communication Strategy for 2014 – 2018* has been adopted, which contains a proposal for comprehensive communication activities for the next five years. The implementation of communication plan will serve to meet the information demand of the public opinion on nuclear safety and radiological protection, and help build authority of the PAA as a professional and efficient institution, holding public trust.

Communication strategy has been divided into three parts:

- Analytical – in which national rules and regulations specifying the disclosure obligations of the PAA and recommendations of international institutions dealing with the dissemination of the highest standards of operation in the nuclear power sector were analysed. It also considers good practices used successfully by foreign Nuclear Safety Authorities in countries with highly developed nuclear industry. In addition, this part formulates PPEJ's stakeholders, media and public opinion information expectations of the PAA.
- Strategic – in this part of the document the communication objectives, target groups, and key information messages were specified and communication challenges were diagnosed.
- Tactical – containing recommendation of the information activities and precisely planned communication tools that will allow to achieve selected goals effectively.

Communication strategy is based on three pillars:

- Safety – it has absolute priority comparing to other aspects of the nuclear industry and the use of ionizing radiation,
- Competence and professionalism – it is reflected in the knowledge and experience of the nuclear regulatory office staff,
- Public confidence - strengthen and maintained through full transparency of activities conducted by the office and the openness to the information demand of public opinion.

Accepted values are the basis for the delineation of the PAA strategic communication objectives, which are:

- improving the effectiveness of communication, information and education activities conducted by the PAA,
- building authority of the PAA as a competent and effective institution, holding the public trust,

- building image of the PAA as a professional, modern and independent office, whose goal is to provide the highest possible standards of nuclear safety and radiological protection.

Properly designed and consistently implemented communication strategy will allow to achieve goals as listed below:

- improving system (and its efficiency) of the nuclear safety and radiological protection,
- improving the functioning of the PAA's office,
- increasing public trust in the PAA and its undertaken actions and decisions,
- raising profile and authority of the office of nuclear regulator.

Properly-organized and efficient communication activities of the PAA will become a part of the national system of nuclear safety and will serve to promote safety culture.

It is required to monitor current communication strategy launch and eventually implement indispensable updates adequately to the current situation due to the particular social sensitivity to the subject of nuclear safety, the current status of nuclear sector development, and dynamics of PPEJ implementation in Poland.

Some new developments in the field of public communication, which have been undertaken by PAA in recent years include, but are not limited to:

- Re-development of PAA's website, which included its mobile version and adjusting the website for the partially disabled according to WCAG 2.0 standards,
- Providing newsletter service to the subscribers,
- Developing Public Information Bulletin – a separate website containing all the vital information on structure and functioning of PAA. The website has also been adjusted according to the WCAG 2.0 standards,
- Producing a series of short educational films which describe the issues of NPP siting, licensing as well as the principles of NPP's safety and safety of radioactive waste disposal
- Creating a professional multimedia presentation about PAA, its tasks and its role in Nuclear Power Programme,
- Initiating regular opinion polls on the perceptive nuclear safety conducted both nation-wide and in the potential NPP siting region,
- publishing quarterly communications to the general public about national radiation situation, also about radioactive contamination levels in normal conditions and in emergency,
- preparation of annual reports on the activities of the Agency's President.
- publishing a quarterly entitled "Nuclear Safety and Radiological Protection";

8.1.10. External technical support and advisory committees

Atomic Law Act provides that The Council for Nuclear Safety and Radiological Protection acts as the consulting and opinion-giving body of the Agency's President. The Council consists of 6 experts on nuclear safety, radiological protection and research reactors. The main task of the Council is in particular issuing opinions following the request of the Agency's President with regard to: draft versions of licences to conduct activities, draft

versions of legal acts drawn up by the Agency's President, draft versions of organizational and technical recommendations issued by the Agency's President.

PAA does not have any formal agreements with Technical Support Organizations yet. However PAA uses the support from various external organizations or experts when needed and orders scientific works in various areas. PAA cooperate inter alia with Office of Technical Inspection, Institute of Heat Engineering of Warsaw University of Technology and National Centre for Nuclear Research. The need to have support from national and international TSO's is recognized. Preliminary talks with Institute of Heat Engineering and Institute of Nuclear Chemistry and Technology were held in 2016, but it is still an ongoing process that will also demand the cooperation with Ministry of Energy. Those activities show that PAA is implementing measures to comply with the cited below suggestion from the IRRS mission:

Suggestion from the IRRS mission's report: "PAA should consider reviewing the availability of external support across the range of technical and other disciplines needed to support the delivery of regulatory functions relating to the NPP programme, especially the early steps of the licensing process (review of site documentation; organizational capability and preliminary safety analysis report) "

At the 6th CNS Review Meeting Poland received 4 challenges and 2 suggestions. One of the challenges for Poland was "Poland is encouraged to consider establishing a relationship with the regulator of the vendor country early in the process. This has been found to be useful in other embarking countries." As the technology for first Polish NPP is still not chosen, this challenge cannot be fulfilled thoroughly. Nevertheless PAA has agreements with various regulatory bodies and once the decision about the vendor is made, the cooperation will be enhanced even further.

8.2. Status of the regulatory body

The PAA independence in performing its functions is assured by the law. The President of the National Atomic Energy Agency constitutes the central organ of the governmental administration, competent for nuclear safety and radiological protection matters to the extent specified in this Act" (Article 109 of the Atomic Law Act).

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

1. matters related to social and economic use of Nuclear Energy are within the scope of activities of Minister of Energy (pursuant to the Act on Governmental Administration Departments)

2. nuclear safety and radiological protection matters are within the scope of activities of PAA President (pursuant to the Atomic Law Act)

Regulatory decision made by the PAA President cannot be affected by any other organ of governmental administration. This authority is ensured by the Atomic Law. The President of PAA and other nuclear regulatory bodies are independent in performing their regulatory functions, in particular regulation of activities involving exposure (issuance of licences and receipt of notifications) and inspection functions determines President's independence in "exercising regulatory control and supervision over the activities leading to actual or potential ionizing radiation exposure of humans and environment, including the

issuance of decisions on licences and authorizations and other decisions, as provided in this Act" (Article 110, Section 2 of Atomic Law) and no other organ can supervise their regulatory decisions except for the Administrative Courts of Law.

Minister of Environment provides administrative supervision of PAA's President and grants the statue of the Agency. PAA President reports annually to the Prime Minister of Poland. At least once in 3 years PAA President need to make assessment of nuclear regulatory activities and perform an analysis of the current legal status in terms of its adequacy and suitability to nuclear safety and radiological protection. Moreover at least once every 10 years, PAA's President shall subject the national nuclear safety and radiological protection system, including the nuclear regulatory activities, to external international review. This was covered by hosting IRRS mission in 2013.

Supreme Audit Office (NIK) which is the top independent state audit body whose mission is to safeguard public spending, have inspected PAA preparations to its role in Polish Nuclear Power Programme in 2013. 3 main tasks were audited – preparation of new regulations, human resources development and organizational changes in PAA. NIK gave PAA positive opinion on every audited task and did not point to any irregularities.

Article 9. Responsibility of the licence holder

Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

According to Article35.1 of the Atomic Law Act "The head of organizational entity authorized to conduct activities involving exposure and consisting in construction, commissioning, operation or decommissioning of nuclear facilities shall be responsible for nuclear safety, radiological protection, physical protection and nuclear material safeguards". Moreover Article 34. of the Atomic Law Act states that "No activities involving exposure and consisting in construction, commissioning, operation or decommissioning of nuclear facilities can be conducted by an organizational entity which fails to comply with the requirements concerning nuclear safety, radiological protection, physical protection and nuclear material safeguards".

Any activity involving exposure and consisting in construction, commissioning, operation and decommissioning of nuclear facilities require a licence from PAA President. System of periodic assessments, inspections and enforcement will serve PAA as the basis to assess whether the licence holder discharges its prime responsibility for safety. Please refer to compliance with article 7.4 and 7.5 for more details.

Licence holder is obliged to inform each asking individual on the status of nuclear safety and radiological protection of the facility, its impact on human health and natural environment, and of the volume and isotopic composition of radioactive substance emissions from the nuclear facility to the environment (article 35a). At least once in 12 months licence holder must publish such information on the website. Investor shall open a Local Information Centre, no later than on the day when the application for construction permit is issued. It is established to provide information on the operation of NPP, status of nuclear safety and radiation protection in the area surrounding the facility for the local community. A local community can establish a Local Information Committee which can provide community supervision over the investment implementation, represent the local community in relations with the investor/operator and inform the local community on the activities of the nuclear

power facilities**.** The Committee will be authorized to enter the facility and request information or documents concerning the investment implementation.

PGE EJ 1 conducts various nation-wide and local activities that aim at dissemination of knowledge about nuclear power, shaping awareness of benefits connected with NPP; challenging stereotypes and building public buy-in for nuclear power in Poland. "*Świadomie o Atomie"* initative is a programme of educational and information activities launched in 2011, which includes comprehensive communication activities carried out by PGE EJ 1 at the local and national level.
Some examples of PGE EJ 1 involvement in raising transparency and openness of the nuclear sector include:

- *Świadomie o Atomie* knowledge portal
- Cooperation with *Los Wiaheros* travel blog
- *Atom dla Nauki* educational programme at universities
- Preparing information materials
- *Pandora's Promise* documentary (translation, distribution in Poland)
- Science festivals

PGE EJ's regional activities (in potential municipalities) also include:

- Education of children and youth
- Running Local Information Points (LIPs) and Holiday Information Spots (HISs)
- Information stands at local open air events
- Study visits at home and abroad
- Updating the community on site investigation and environmental surveys

PGE EJ 1 also conducts local and nation-wide surveys focused on level of support for NPP build

Provisions for obtaining appropriate financial and human resources by the licensee are described in Article 11. The financial provisions to cover the possible harms caused by a nuclear accident have been arranged according to Vienna Convention to which Poland is a Party, by means of obligatory third party responsibility insurance required from the nuclear installation's operator, according to *the Minister of Finance' regulation on obligatory third party liability insurance of nuclear installation operator* (Art.103.10), issued on 14.09.2011.

Article 10. Priority to safety

Each Contracting Party shall take the appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety.

As stated in Article 9 the prime responsibility rests on the head of a licenced organizational entity. In addition to the investor's or operator's obligations, other persons (organizations) involved in the project of a nuclear installation are responsible, in accordance with their duties, for ensuring compliance with the nuclear safety and radiation protection requirements (Art.35.3.).

The Atomic Law Act requires that, beginning from site selection, through construction, commissioning and in operation, such technical and organizational measures shall be taken in accordance with the most updated scientific and technical knowledge, that are necessary to eliminate, in all operational stages of a nuclear facility and in emergency situations, the harmful effects to the facility staff, the public and the environment (Art.35.4.).

Furthermore any organization involved in construction, operation or decommissioning of nuclear facilities shall have an integrated management system which includes quality policy and quality assurance programme (Art. 36k.). The definition of Integrated Management System included in Atomic Law gives the priority to nuclear safety by making sure that all decisions are adopted on the basis of the results of nuclear safety analysis, radiological protection, physical protection and the protection of nuclear materials.

Recognizing the need to strengthen both knowledge about safety culture in PAA and safety culture in organization itself PAA hosted IAEA experts' mission in August 2015. The objective of the Mission was to support the PAA activities aimed at strengthening of internal safety culture in nuclear regulatory supervision. During three days of meetings and workshops the Polish and foreign experts exchanged their experience and best practices in the field of implementation and strengthening of safety culture. The PAA management had the opportunity to take part in very interesting workshops devoted to the leadership, organization culture and communication. During the meeting dedicated to all employees of the PAA Agency, the basic information on the issue of safety culture was presented.

One of the challenges from 6th Review Meeting of CNS Contracting Parties was "How to improve regulators' independence, safety culture, transparency and openness". As Polish regulatory body is growing with mostly young people being hired the need to learn about safety culture and its significance was identified. Abovementioned IAEA organized workshop with international experts definitely improved the understanding of safety culture within the organization, still PAA is aware that it is an ongoing process that requires challenging attitude. Nevertheless organizing workshops strictly on the issue of "safety culture" for the whole organization with strong engagement from management was a success for PAA and can be advised for any other regulatory body that would like to enhance its safety culture.

Article 11. Financial and human resources

1. Each Contracting Party shall take the appropriate steps to ensure that adequate financial resources are available to support the safety of each nuclear installation throughout its life.
2. Each Contracting Party shall take the appropriate steps to ensure that sufficient numbers of qualified staff with appropriate education, training and retraining are available for all safety-related activities in or for each nuclear installation, throughout its life.

11.1.Financial Resources

11.1.1.Financial provisions to ensure safety of nuclear installation throughout its lifetime

According to Article 38g section 1 item 2 of the Atomic Law Act the licence to conduct activities consisting in constructing, commissioning, operating and decommissioning of nuclear facilities shall only be granted to organizational entity which has sufficient funding to cover the costs of nuclear safety, radiological protection, physical protection and nuclear material safeguards at subsequent stages of the nuclear facility operation, until the facility is decommissioned and in the case of a licence granted to build the nuclear facility organizational entity needs to have sufficient founding to finish the construction.

In order to confirm that the required funding to cover the costs of nuclear safety, radiological protection, physical protection and nuclear material safeguards at subsequent stages of the nuclear facility operation, until the facility is decommissioned is available, the following documents shall be enclosed to the application to conduct activities consisting in

constructing, commissioning, operating and decommissioning of nuclear facilities: documents confirming the availability of funding, and in particular, bank account statement, bank guarantee or insurance guarantee, financial report featuring estimated costs and expenditure which need to be incurred.

In order to confirm that the required funding for construction of the nuclear facility is available the following documents shall be enclosed to the application: documents confirming the availability or possibility of obtaining funding to finish the construction including the financial plan and financial report featuring estimated costs and expenditure which need to be incurred.

The operator's policy regarding appropriate funding of its activities should therefore take into account the above principles. PAA will be assessing financial provision with other documentation required in the licensing process.

Principles for financing safety improvements to the nuclear installation over its operational lifetime, are ensured by the ability to enforce necessary actions by the PAA's President. Renovation of any nuclear facility system, construction element or installation important for the nuclear safety and radiological protection, and each reactor start-up following fuel load or renovation of any structure, system or component shall require a written approval of the Agency's President (Article 37d. of the Atomic Law). If it is considered necessary from the viewpoint of nuclear safety, radiological protection, physical protection and nuclear material safeguards – especially based on the conclusions from the periodical assessment reports, the Agency's President is authorized to amend the conditions of activities covered by the licence (Article 39h.1).

11.1.2.Financial provisions during the period of commercial operation for decommissioning and management of spent fuel and radioactive waste from nuclear installations

Article 38d of the Atomic Law provides for the system of financing the costs of the spent nuclear fuel and radioactive waste disposal and the costs of nuclear power plant decommissioning. 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 authorized to operate a nuclear power plant shall make quarterly payments to a "decommissioning fund", with dedicated bank account assigned to the found. Resources collected on the account can be deposited on fixed-term deposit accounts or invested in bonds emitted by the Minister competent in the matters of public finance.

Amount of the fee to be paid for the decommissioning fund was determined by Regulation of the Council of Ministers of 10 October 2012 on the amount of contributions to cover the cost of the final management of spent fuel and radioactive waste, and to cover the costs of decommissioning a nuclear power plant made by the organizational entity, which has received a licence for the operation of a nuclear power plant (Journal of Laws of 2012, item 1213) and is set to PLN 17.16 for each MWh of electricity produced in a nuclear power plant.

In determining the amount of payments for the decommissioning fund the Council of Ministers took into account expected: life of a nuclear facility, the amount of radioactive waste including spent nuclear fuel produced by the facility, the final cost of disposal of the waste, and the cost of decommissioning a nuclear facility. It should be also noted that with the progress in the implementation of the Polish Nuclear Energy Programme in the future it

may be necessary to amend the amount of payments to the decommissioning fund. Deadline for payments was determined on the fifteenth day of the month following the quarter to which the payment relates, as from the first day of the quarter following the quarter in which the nuclear power plant produced the first MWh of energy, until the start of the decommissioning.

Resources collected on the decommissioning fund may only be allocated to cover the cost of the final radioactive waste and spent nuclear fuel disposal from those plants and to cover the costs of decommissioning the nuclear facility. Therefore, withdrawal of resources from the decommissioning fund will take place only after approval granted by the President of the PAA.

In order to allow the President of the PAA to supervise organizational entity's obligation to make payments to the decommissioning fund, the manager of the organizational unit holding a licence for operation or decommissioning of a nuclear power plant will have to submit quarterly reports to the President of the PAA stating the amount of payments to the decommissioning fund and the amount of megawatt hours of electricity produced in this quarter. The report shall be produced according to the model prescribed in the Regulation of the Council of Ministers of 27 December 2011 on the model of the quarterly report on the amount of contributions paid to the decommissioning fund (Journal of Laws of 2012, item 43), no later than the twentieth day of the month following the quarter, which it relates to. In the event that organizational entity delays in making payments for at least 18 months, the President of the PAA will be entitled to stop operation of a nuclear power plant.

11.1.3. Aarrangements for ensuring that the necessary financial resources are available in the event of a radiological emergency

Article 93 of Atomic Law states that costs of intervention measures and of the elimination of radiation emergency consequences shall be borne by the organizational entity, which caused this radiation emergency. In the event of radiation emergency which has not been caused by an organizational entity, the costs shall be borne by the perpetrator, whereas in the event of emergency caused by an unknown perpetrator or when such costs may not be exacted from the perpetrator, and also in the event of emergency which has occurred outside the borders of the Republic of Poland - such costs shall be borne by the national budget. If the means at the disposal of the authority that directs the actions aimed at the elimination of the hazard and of emergency consequences are inadequate, this authority may impose the obligation to render personal and material services with respect to relevant regulations concerning the services rendered to overcome natural disaster situations.

Civil liability for nuclear damage is also provided by the Atomic Law Act. Article 101 provides that exclusive liability for nuclear damage caused by a nuclear incident in nuclear installation or related to this installation, shall be borne by the operator, with the exception of damage caused directly by acts of war or armed conflict. The operator’s liability for nuclear damage shall be limited to the amount equivalent to SDR 300,000,000.

11.2. Human Resources

The requirements concerning competence of the part of the staff of investor/operator are specified in the Atomic Law Act:

„Article 12c.1. In any organizational entity conducting activities involving exposure and consisting in commissioning, operation or decommissioning of a nuclear power plant, all

positions important from the viewpoint of nuclear safety and radiological protection shall be occupied exclusively by individuals possessing an appropriate authorization.
2. The activities referred to in Section 1 herein shall include activities directly related to the management and operation of a nuclear power plant, and the management of nuclear fuel and radioactive waste at a nuclear power plant.
3. The authorizations referred to in Section 1 herein shall be granted by the Agency's President of by way of administrative decision, to individuals who:

1) have full legal capacity;
2) hold a medical certificate on the absence of contraindications for work in occupational exposure conditions issued according to the regulations issued under Article 229 § 8 of the Labour Code Act of 26 June 1974;
3) hold a medical certificate concerning the absence of mental disorders listed in the Protection of Mental Health Act of 19 August 1994 (Journal of Laws No. 111, Item 535, with later amendments), and the absence of any psychological disorders;
4) have a higher education degree and professional experience necessary to be authorized to conduct the relevant activities at a nuclear power plant;
5) successfully passed the post-training examination, both theoretical and practical, referred to in the regulations issued under Article 12d, Section 8;

4. The authorizations referred to in Section 1 herein shall be granted for the period of 3 years.

Regulation by 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, specifies inter alia: list of activities important for nuclear safety and radiological protection in an organizational unit; detailed conditions and procedure for granting by the President of PAA authorizations to perform those activities and required programmes of trainings, including practical trainings and forms of trainings organized. Types of activities which require authorizations are as follows: management of the organizational unit, management of commissioning and operation of NPP, operating supervision and control (of the reactor and operations with the fuel). Candidates who apply for the authorizations to perform those activities need to undertake trainings specified in the above regulation. Scope of the practical and theoretical training depends on the type of activity.

According to Article 11 of the Atomic Law also other employees of an organizational entity conducting activities involving exposure are covered by training programme. This is an internal training which is ensured by the head of entity after a prior verification of the training programme by PAA. The training programme is an element of documentation submitted by an applicant in order to obtain the PAA President's licence for the performance of activities involving exposure and is subject to analysis and assessment by the PAA departments conducting appropriate analyses and regulatory safety assessment of the activities specified in the application for a licence – i.e. depending on whether it concerns nuclear facilities or activities with radioactive sources: the Nuclear Safety Department or Radiological Protection Department. In case of nuclear power plants - trainings involving performance of tasks and activities using simulators of the actual nuclear installations operating at the given nuclear power plant, and for research reactors - trainings involving specialist software that imitate the operation of equipment and research reactor, should be undertaken. The head of the organizational unit shall draw up short-term personnel training plans at least once every 3 years, as well as long term personnel training plans at 10 year intervals.

Article 108a of the Atomic Law obliges Ministry of Energy to conduct activities aimed at ensuring competent professionals in the nuclear power sector. Ministry of Energy is preparing Human Resources Development Plan for Nuclear Power, with the aim to assess staffing needs for Polish nuclear power sector. The *Plan* will specify and detail the tasks to be delivered and the measures enabling to develop the staff training infrastructure for nuclear power in Poland.The document is expected to be finalized in the first quarter of 2017. More detailed information of Ministry Energy activities in the field of human resources development can be found in Annex no.2 – subchapter 2.3.

PAA prepared its own human resources plan. For more details see compliance with Article 8 – regulatory body.

Currently, several majors/specialties directly related to nuclear energy are already available at Polish universities, although presently there is no comprehensive system of staff training. Moreover, recognizing the role of science in the nuclear power development the Minister of Economy (currently Minister of Energy) has asked Minister of Science and Higher Education to establish a strategic project considering “Technologies supporting the development of safe nuclear power”. The Minister of Science has devoted 50 mln PLN for the activity. 10 scientific projects have been announced in 2012 and finished in 2014.

Article 12. Human factors

Each Contracting Party shall take the appropriate steps to ensure that the capabilities and limitations of human performance are taken into account throughout the life of a nuclear installation.

Polish regulatory system takes human factors into account both on the level of Atomic Law Act and several regulations including: Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design and 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 licence for the construction of a nuclear facility and the scope of the preliminary safety report for a nuclear facility.

According to Article 36c section 1 item 3 of the Atomic Law Act nuclear facility design shall include solutions that safeguard reliable, stable, easy and safe operation of the nuclear facility, with particular attention to factors related to man-machine cooperation between personnel and operating systems, construction elements and installations.

Also to ensure that the personnel working at a nuclear facility has all necessary knowledge and practice the head of organizational entity licenced to operate a nuclear facility is obliged to ensure preliminary and periodic trainings for workers at intervals defined in the licence, at least every 5 years (Atomic Law Act Art. 11). For nuclear power plants these trainings shall address among others:

- general radiological protection procedures;
- procedures of conducting workplace-specific tasks and activities;
- performance of tasks and activities using simulators of the actual nuclear installations.

The head organization is also obliged to prepare short-term personnel training plans at least once every 3 years and long term personnel training plans at 10 year interval. Those plans have to be approved by the President of PAA.

The Regulation on nuclear facility design provides more specific regulations. It states that the design shall apply solutions concerning safety level sequences in order to prevent

any possible negative consequences caused by human error during nuclear facility operations or during the performance of maintenance activities concerning operations, including nuclear facility repairs and modernization (§. 4.2.4)).

Furthermore (§. 43 of the The Regulation on nuclear facility design) nuclear facility shall be designed so as to minimise the possibility and limit the consequences of human error, with particular consideration being given to the spatial layout of the nuclear facility and to ergonomics. Nuclear facility design solutions shall ensure the conditions for the appropriate activities of the nuclear facility operator, taking into account the time available for these measures, the anticipated work environment and the psychological strain of nuclear facility operators. Nuclear facility design solutions shall minimise the probability of situations which require intervention measures by the nuclear facility operator over a short period of time; however, if such intervention measures are taken by the operator, the solutions shall ensure that:

1) the operator has at his disposal sufficient time to take the right decisions and measures;
2) the necessary information for the operator to make the right decision is presented in a simple and unequivocal manner;
3) following the accident, in the main control room or the back-up control room and in the route leading to the back-up control room, there is an acceptable occupational environment in terms of radiological protection and work health and safety.

§44 of the regulation on nuclear facility design considers human factors in main control room design. When designing the main control room and the back-up control room of the nuclear facility:

1) human factors shall be analysed and taken into account appropriately, in particular aspects of man-machine interaction so as to ensure an appropriate and transparent division of control functions and steering between nuclear facility operators and nuclear facility automated systems; furthermore, the nuclear facility design shall define the minimum number of operating personnel required for the simultaneous performance of measures necessary for the nuclear facility to attain a safe shut-down state;
2) application shall be made of solutions guaranteeing that nuclear facility operators are provided with complex but easy-to-understand information which is relevant in terms of the punctual making of the right decisions and the performance of activities.

Consideration of human factor is also taken into account in design of the protection systems. The protection system shall be designed so as to permit it to prevent nuclear facility operator activities which could foil the effectiveness of the protection system in operational states and accident conditions, but would not render impossible correct activities of the nuclear facility operator in accident conditions (§87.2.3).

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 licence for the construction of a nuclear facility and the scope of the preliminary safety report for a nuclear facility also gives some requirements to include human factors in safety analyses of a nuclear facility, identifying the internal PIEs and probabilistic safety analysis with particular interest in analysis performed in order to identify all failure and error sequences which contribute to the risk. It reflects in the structure and content of the safety analysis report, with chapter 5.6 devoted to “Consideration of human factors in the nuclear facility design” and taking human factors into account in chapter 7 – nuclear facility safety analyses.

Regulation by the council of ministers of 27 December 2011 on periodical safety assessment of a nuclear facility gives consideration to “impact of nuclear facility’s employees and their behavior and issues related to the performance of safety priority principle on the state of a nuclear facility” in the scope of the periodical safety assessment report

Article 13. Quality assurance

Each Contracting Party shall take the appropriate steps to ensure that quality assurance programmes are established and implemented with a view to providing confidence that specified requirements for all activities important to nuclear safety are satisfied throughout the life of a nuclear installation.

The Atomic Law Act requires (Art.7.2) that every holder of licence issued by the President of PAA is obliged to establish and implement quality assurance programme. Submission of this programme document as attachment to the application for the licence is prerequisite to obtain the licence. The programme is subject to review by regulatory body together with safety analysis report. Practical implementation of the programme is subject of control by regulatory body inspectors.

According to the Atomic Law (Art. 36k.) QA programme is a part of an integrated management system of nuclear facility. In order to ensure implementation and documentation of the system as a whole, the integrated management system should include actions that are taken directly by the licence holder as well as other actions crucial for nuclear safety and radiological protection that are taken by contractors and subcontractors. Integrated management system is defined via documentation that includes:

1) quality policy;
2) quality assurance programme;
3) description of the management system;
4) description of the organizational structure;
5) description of responsibilities, duties, authorizations of and interdependencies between personnel involved in management, implementation and assessment operations;
6) description of interdependencies between external entities;
7) description of organizational entity processes along with explanations concerning preparation, revision, implementation, documentation, assessment and improvement of the nuclear facility daily operations;
8) safety classification of nuclear facility systems, construction elements and installations;
9) preliminary safety report and final safety report.

Integrated management system records have to be submitted to the President of PAA for approval along with application for a licence.

The QA programme should describe the ways of assuring that all quality-related activities will be performed in the properly controlled conditions, i.e. by properly qualified personnel using appropriate tools, equipment, methods and technological processes and under suitable environmental conditions, so that the required quality is attained and may be verified by inspection or test. Review and assessment of this programme shall be carried out by the regulatory body at all stages of the licensing process, i.e. prior to and during the construction, during commissioning and operation. If necessary, suitable conditions and requirements will be included in the licence.

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

Article 14. Assessment and verification of safety

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

i. ***comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and throughout its life. Such assessments shall be well documented, subsequently updated in the light of operating experience and significant new safety information, and reviewed under the authority of the regulatory body;***
ii. ***verification by analysis, surveillance, testing and inspection is carried out to ensure that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, and operational limits and conditions.***

14.1. Assessment of safety

Article 36d of the Atomic Law provides that before applying for a nuclear facility construction licence to the Agency's President, the investor shall carry out nuclear safety analyses, taking into account the technical and environmental factors, and shall have them verified by independent entities which are by no way involved in the design process of the future nuclear facility. Safety analyses include probabilistic and deterministic safety analysis. Deterministic analyses for design conditions shall be based on the conservative approach and analysis of accidents which are more severe than design basis accidents may be analyzed based on best estimate methodology. Based on the safety analysis results, the investor shall draw up a preliminary safety report to be forwarded to the Agency's President along with the application for the construction licence.

Detailed requirements on the scope of the preliminary safety report are provided in 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 licence for the construction of a nuclear facility and the scope of the preliminary safety report for a nuclear facility. This regulation was based on several IAEA safety standards, including NS-G-1.2 (now superseded by GSR Part 4) SSG-2, SSG-3, SSG-4, GS-G-4.1 and relevant WENRA, "EUR" documents as well as guides and regulations from several other countries.

Safety report that need to be included with the application for commissioning must have a scope specified in the above mentioned regulation. Safety report that need to be included with the application for operation should have updated information included in the commissioning safety report along with information and assessment of commissioning stage. Detailed scope of these reports is described in Regulation of the council of ministers of 10 September 2015 on the documents required with the application for the licence for activities involving the exposure to ionizing radiation or with the notification of such activities.

According to Article 37e of the Atomic Law head of the organizational entity shall perform periodical safety review. The exact time interval will be stated in the licence but should not exceed 10 years. Detailed periodical safety review plan needs to be approved by the PAA's President. Based on the periodical safety review, the head of organizational entity shall draw up a periodical safety review report to be submitted to the Agency's President for approval until by the deadline stated in the licence for the nuclear facility operation. Regulation by The Council of Ministers of 27 December 2011 on periodical safety review of a nuclear facility provides for a detailed scope of periodical safety review of a nuclear and a scope of periodical assessment report. If - based on the conclusions from the periodical assessment report - it is considered necessary from the viewpoint of nuclear safety, radiological protection, physical protection and nuclear material safeguards, the Agency's President is authorized to amend the conditions of activities covered by the licence. Taking all of this into account it can be said that polish provisions of law meet the second principle of the Vienna Declaration and address the lessons learned from Fukushima accident concerning periodic reviews of plant safety.

During the licensing process of polish research reactor MARIA in 2014/2015 PAA has prepared Safety Evaluation Report which was the assessment of SAR prepared by operator. This experience will be a base to create internal procedure on reviewing the safety assessment reports in the licensing process of nuclear facilities. It will also comply with **suggestions** from the IRRS mission's report:

- *The regulatory body PAA should develop procedures covering the review and assessment of new facilities, design modification and SAR amendments for research reactors.*
- *PAA should consider defining a strategy for production or endorsement of internal guidance which specifies the principles, requirements and associated criteria for safety used to inform regulatory judgements, decisions and actions taken during the review and assessment of material submitted as part of licence applications.*

Review and assessment of the Research Reactor Maria that has been made, in the process of granting new licence for the research reactor complies with the r*ecommendation from the IRRS mission's report: "As part of the upgrading of MARIA research reactor to comply with the Atomic Law Act by 2015, PAA should conduct a full safety evaluation of the application".*

14.2. Verification of safety

Safety of nuclear installation during its operation is under constant verification performed by the licenced operator and by the regulatory body - PAA. Main responsibilities of licensee for performing verification of safety are stated in the Regulation of the Council of Ministers of 11 February 2013 on requirements regarding commissioning and operation of nuclear installations.

The Regulation states that operation of nuclear installation has to be conducted accordingly to the operational limits and conditions which are determined by the President of PAA. These conditions cover among others requirements for inspection and oversight of systems, construction elements and equipment which are important regarding nuclear safety and radiological protection. Moreover the head of organizational entity licenced to operate a nuclear facility is obliged to prepare a programme of maintenance, repairs, oversight and

inspection of these important systems and elements. This programme has to consider ageing processes.

Regarding regulatory verification of safety the nuclear regulatory bodies (the PAA President and nuclear regulatory inspectors) in accordance with Article 64 Section 4 of the Atomic Law Act, must first of all:

1) issue the licences (the PAA President) and other decisions in the matters involving nuclear safety and radiological protection, according to the principles and procedures established by the Act,
2) conduct inspections in nuclear facilities and in organizational entities which hold nuclear materials, ionizing radiation sources, radioactive waste and spent nuclear fuel.

Particular powers of a nuclear regulatory body were specified in Article 66 Section 1 of the Atomic Law Act. In accordance with this Article, in the context of regulatory control, nuclear regulatory bodies are authorized to:

1) around-the-clock access to the sites, facilities, premises and transport vehicles of the inspected organizational entities, being suitably equipped to do so;
2) scrutinize the documentation, logbooks and other data carriers concerning nuclear safety and radiological protection in the inspected organizational entity;
3) request copies of the documents and data carriers referred to in Item 2 to be produced or provided;
4) verify whether the activities of the inspected organizational entity are conducted in compliance with nuclear safety and radiological protection regulations and with the requirements and conditions established in the licences;
5) conduct independent technical and dosimetric measurements, whenever needed;
6) request written or oral information in matters under scrutiny, and to interview the head and personnel of the inspected organizational entity, as well as external workers and apprentices;
7) collect samples for laboratory tests;
8) inspect the site, facilities, premises and installations of the inspected organizational entity and its transport vehicles;
9) record the processes and results of inspection as referred to in Item 8 using audio-visual recording systems;
10) secure and request securing (confirming security) documents and other proofs;
11) during inspections of nuclear power plants – to request the assistance of expert laboratories and organizations authorized by the Agency's President and during inspections of other organizational entities – to request the assistance of experts, specialists and laboratories.

The head of inspected entity is obliged to enable nuclear regulatory bodies the performance of inspection ensuring suitable conditions for the inspection. In accordance with Article 37 of the Atomic Law Act inspection concerns producers and suppliers of nuclear facility systems, construction elements and installations, as well as contractors for systems, components and works important for the nuclear safety, radiological protection and safe operation of installations referred to in the regulations issued under Article 5, Section 4 of the Technical Inspection Act of 21 December 2000, carried out or provided during construction, fitting, commissioning, operation and decommissioning of a nuclear facility. The inspection

referred to above consist in checking selected nuclear facility systems, construction elements and installations which are ready or being made, as well as works which are being performed at the nuclear facility.

The head of organizational entity conducting activities involving exposure and consisting in the operation of nuclear facility is obliged to regularly forward the nuclear facility operating parameters which are important for the nuclear safety and radiological protection to the Agency's President.

The nuclear regulatory body possesses appropriate legal measures which enable it to respond to situation when the head of an organizational entity does not comply with the binding provisions of law concerning the performance of activities involving exposure. The nuclear regulatory body may first of all use legal measures specified in Chapter 9 of the Atomic Law Act i.e. injunctions and interdictions, including order to to stop the operation of a nuclear facility (Article 68 of the Atomic Law Act), decisions to eliminate non-conformances (Article 68b of the Atomic Law Act), post-inspection decisions (Article 69 of the Atomic Law Act), recommendations (Article 68a of the Atomic Law Act). The above measures are used if any non-conformances and irregularities are found during inspection and are intended to:

1) eliminate direct threat to nuclear safety and radiological protection (injunctions and interdictions);
2) eliminate non-conformances if it has been found that factual and legal status is not in compliance with conditions specified in the licence or in provisions regulating activities covered by the licence (decisions to eliminate non-conformances);
3) eliminate other errors or failures than those specified in Item 2 (post-inspection decisions);
4) improve the status of nuclear safety or radiological protection in the inspected entity (recommendations).

The nuclear regulator may also charge the authorized party with a fine in cases specified in Article 123 of the Atomic Law Act. Fines are imposed in the form of administrative decision.

Polish regulations allow for regulatory oversight of the safety of nuclear installations and to impose improvements in safety on operating organization so comply relevant lessons learned from Fukushima Accident presented in "The Fukushima Daiichi Accident Report by the Director General".

14.3. How to minimize gaps between Contracting Parties' safety improvements – challenge to all Member States

Propositions of ideas to minimize gaps between Contracting Parties' safety improvements:

- promotion of "good practices" in regard to action taken by Contracting Party with regard to lessons learned from Fukushima Daiichi accident. Whereas "good practices" are to be assigned only for exceptional actions and examples, "post-Fukushima good practices" may be more common, therefore giving the chance for other Contracting Parties to follow those actions. They may be the part of the Rapporteur Country Review Report and then collection of most important "post-

Fukushima good practices" may be included in Summary Report, that way promoting them for implementation in Contracting Parties Nuclear Installations.

- Promotion of safety improvements and good practices by organizations like WANO (World Association of Nuclear Operators)
- Strengthening regulatory bodies and their knowledge about worldwide good practices in safety improvements, by international cooperation, workshops and financial help. The main change of approach should nevertheless come from both strong regulatory body and operator willing to focus on safety, including safety improvements.

Article 15. Radiation protection

Each Contracting Party shall take the appropriate steps to ensure that in all operational states the radiation exposure to the workers and the public caused by a nuclear installation shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits.

The radiological protection issue at the national level is addressed in the chapter 3 of *Atomic Law Act* and several relevant secondary regulations in which internationally endorsed criteria and standards had been incorporated. The Act takes into account the *Basic Safety Standards for radiation protection* (BSS- *International Basic Safety Standards for Protection against Ionizing Radiation and for the safety of Radiation Sources, IAEA Safety series No.115* based on ICRP 60/72). It is aimed at ensuring the compliance with the provisions of the *EURATOM Treaty* and appropriate EU directives. Besides of the *Directive 96/29/EURATOM on basic safety standards in health services, for the protection of workers and of the members of the public against the ionizing radiation risks*, the Atomic Law provisions introduce the requirements contained in other EU directives, relevant for the protection of workers and general public. They provide for the fundamental set of nuclear safety and radiological protection requirements. Detailed requirements, concerning specific facilities and activities conducted by individual licensee are specified in the licensing conditions. These conditions take into account the results of assessments and analyses performed to establish the operational conditions and limits assumed in safety reports for these facilities and activities.

Dose limits are established strictly according to the EU Directive 96/29 EURATOM in the governmental regulation on ionising radiation dose limits, first issued on 28 May 2002, replaced by its updated version on 18 January 2005. The effective dose limit for workers is 20 mSv per year (or equivalent dose for the lens of eye – 150 mSv per year, for the skin 500 mSv per year and for the hands, forearms, feet and ankles – 500 mSv per year), it is allowed however to exceed it up to the 50mSv in calendar year provided that in any five-year period of his occupational exposure the worker shall not exceed effective dose of 100 mSv (average value of 20 mSv yearly). The same limits are for apprentices and students over 18 years old. For this category for age between 16 and 18 years old yearly limit is 6 mSv/y , for younger than 16 years – 1 mSv/y – the same as for general public. If the worker is pregnant woman, the limitation of her doses has to be such as her child to be born does not exceed the dose of 1 mSv. In special circumstances, strictly defined by law, the limits above may be exceeded with exclusion of apprentices, students and pregnant women. For population equivalent dose limits are 15mSv per year for the lens of eye and 50 mSv per year for skin; the limit of 1 mSv per year may be exceeded provided that in five-year period the effective dose shall not exceed 5 mSv. Workers exposures are subject to optimisation. For this purpose the radiation protection targets may be established by the management of facility. They are not subject to

review or endorsement by the regulatory authority. On the contrary, the discharges of effluents to the environment are under control by the regulatory body and numerical values of relevant limits are usually included into the terms of licence. For the purpose of protection of population groups living in vicinity of nuclear facility the zone of limited use is established within such distance from the facility, that the effective dose at its perimeter does not exceed the value of 0.3 mSv. Under the Atomic Law, the responsibility for compliance with the nuclear safety and radiological protection requirements rests upon the Head of organizational entity conducting activities / practices involving exposure (Art.7). This exposure must not exceed the dose limits described above, established in the regulation issued under the Art. 25.1 of the Atomic Law. At the same time the principle of exposure optimization must be observed (Art.9). This means that the activity should be conducted in such way that – after reasonable consideration of economic and social factors – the number of exposed workers and members of general public and their doses are as low as reasonably achievable. According to this principle, the Head of the organizational entities is responsible for assure and perform an assessment of the employees' exposure. If it seems to be necessary from the exposure optimization analysis – the Head of organizational entity shall establish the authorized limits for the workers' exposure (dose constraints) to ensure that their ionising radiation doses will be not greater than these limits, which in turn are lower than dose limits. If the authorized limits are established in the licence, the licensing authority has to be notified of the possibility of their overrun by the organizational unit manager. The assessment of the employees' exposure is based on individual dose measurements or radiation measurements in the workplace environment. The workers whose exposure – according to the manager's assessment – can exceed 6 mSv in one year in the terms of effective dose or three tenths of dose limit values for skin, limbs and eye lens in terms of equivalent dose, shall be subject to the exposure assessment based on systematic individual dose measurements (category A workers). For these workers the organizational unit director is obliged to maintain a register of their individual doses based on systematic measurements and doses' assessment conducted by accredited entities. The data concerning these exposures must be relayed systematically (in compliance with the requirements established in the *Regulation of the Council of Ministers of 23 March 2007 on the requirements for the individual doses registration*) to the authorized medical practitioner, who maintains medical records of these workers, and also to the Central Dose Register of the PAA President. To match the methods of exposure assessment to the expected exposure level for workers, two categories of workers are established: category A (for workers who may be exposed to an effective dose exceeding 6 mSv/y or to an equivalent dose exceeding three-tenths of the dose limits for eye lens, skin and limbs) and category B (for workers who may be exposed to an effective dose exceeding 1 mSv/y or to an equivalent dose exceeding one-tenth of the dose limits for eye lens, skin and limbs). The data related to the doses obtained by workers classified (by their supervisor) as "category A workers" is collected since year 2003 in the Central Dose Register of the President of the National Atomic Energy Agency. These data are based on the measurements of whole-body effective dose or equivalent dose to a specified exposed body part (e.g. the hands). Exceptionally, in the cases of exposures to radioactive contamination from the so-called unsealed sources, the assessment of committed dose from internal contamination is performed. Radiation dose measurements are performed by specialized laboratories. The Central Dose Register is kept in the form of an electronic data-base comprising electronic registration cards, separate for every "category A worker". Data are stored until the worker reaches the age of 75 years, but not shorter than for 30 years from the end of the calendar year in which the last entry concerning the given worker has been

made. The total number of workers classified as “category-A workers” and recorded in the Central Dose Register exceeded 5000. The data show that approximately 97% of category-A workers did not exceed the lower limit for this category of exposure (6 mSv/y) and above 99% did not exceed the 20 mSv/a limit. Each case of exposure exceeding the annual dose limit of 20 mSv is subjected to a detailed investigation by regulatory inspectors.

Head of organizational entity, prior to employing a worker in radiation exposure conditions, shall apply to the PAA President for the information from the Central Dose Register on the doses received by this worker in the calendar year in which the application is submitted, and also in the period of the four preceding calendar years. All employers of the category A workers are obliged to submit the dose data of their employees yearly before 15 April next year, and each time after the dose limits were exceeded or the employee finished its employment.

Article 16. Emergency preparedness

1. Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency.
For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body.
2. Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.
3. ***Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency.***

Regulation of the Council of Ministers of 20 February 2007 on the emergency plans for radiation emergency (issued on 23 December 2002, OJ (Dz.U.2002) no 239, item 2033, last amendment in 2007, OJ (Dz. U. 2007) no 131 item 912), defines the responsibilities, scope, requirements and general rules of cooperation in a case of radiation emergency. According to this regulation, the plans on different levels (facility level, province level, national level) and appropriate emergency preparedness arrangements have to be in place and maintained by the organizations and bodies responsible for directing actions aimed at eliminating the threat and its consequences, and in particular - for implementation of intervention measures in case of radiation emergency with consequences beyond the site where it has occurred. The same bodies are responsible for systematic testing of these plans and arrangements within the prescribed time-intervals as established by the Atomic Law for national level (Art.96) and by the regulation of the Council of Ministers on the emergency plans for radiation emergency. There are emergency plans for spent fuel and radioactive waste management facilities localized at Świerk site and for the National Radioactive Waste Repository in Różan.

The external transportation of radioactive waste is essential for these plans. The plans include internal and external communication and cooperation (President of the National Atomic Energy Agency, Province Governor office and services, State Regional Sanitary Inspector, police, fire-department). The Atomic Law Act requires that during on-site radiation emergency, the actions aimed at the elimination of the threat and its consequences shall be directed by the facility manager (licensee). During radiation emergency on regional scale

actions including intervention measures shall be directed by the governor of a province (Voivode) in co-operation with the proper Regional Sanitary Inspector. On national level this is responsibility of the Minister of Interior, with the PAA President assistance.

This minister is obliged by Law (Art.96.2 of Atomic Law) to perform exercise to test the national level radiation emergency preparedness plan at least once every 3 years. According to present requirements (Art.96.1 of Atomic Law, Regulation of the Council of Ministers on the emergency plans for radiation emergency) the frequency of testing of the relevant plans at regional (provincial) and facility level must be established within each particular plan by the province governor or the facility manager respectively. In practice such exercises are performed once every -two years for the facility and once every three years for the province. As there is no NPPs in Poland and existing other nuclear facilities are sited far from the national borders, it is rather unlikely that Poland could create immediate radiation threat to a neighbouring country. Also the NPPs in neighbouring countries are not located in the close vicinity to Poland's borders. However appropriate arrangements have been made to be able to respond adequately to even very unlikely radiation emergency situation.

According to the Atomic Law the PAA President is responsible for performing the tasks concerning the assessments of national radiation situation in normal conditions and in radiation emergency situations, and the transmission of relevant information to appropriate authorities and to the general public. For the purpose of information gathering and of assessment and forecasting of radiation situation development, the President of PAA has established **the Radiation Emergency Centre** "CEZAR" being one of the departments **in the PAA structure,** which operates **National Contact Point** (for domestic matters and for EC, IAEA, CBSS, and bilateral agreements) and has direct access to the data from the Country-wide system for early detection of radioactive contamination (early warning radiation monitoring system), the meteorological data as well as appropriate computerized tools (decision support systems e.g. RODOS, ARGOS), relevant data bases, and the staff adequately trained to operate these tools, to perform analysis and prognosis and to formulate recommendations for decision makers.

CEZAR operates also the **International and Domestic National Warning Point** (NWP) working on 24h a day/7 days a week basis. It serves as a channel of exchanging information on radiation emergencies with IAEA, EC, CBSS, and neighbouring countries according to international conventions and bilateral agreements. Poland has signed bilateral agreements on early notification of a nuclear accident and on cooperation in nuclear safety and radiological protection with Denmark (1987), Norway (1989), Austria (1989), Ukraine (1993), Belarus (1994), Russian Federation (1995), Lithuania (1995), Slovak Republic (1996), Czech Republic (2005) and Germany (2009).

Poland participates in international projects in the emergency preparedness area, therefore Radiation Emergency Centre CEZAR of PAA regularly participates in many international exercises and tests organized by IAEA (CONVEX level 1, 2 and 3), EU (ECURIE level 1 and 3), NEA-OECD (INEX-5 in 2011), Council of Baltic Sea States (CBSS) EGNRS (Expert Group for Nuclear and Radiation Safety), and within bilateral agreements with neighbouring countries. Each year CEZAR participates in several domestic exercises on the national or regional level. Special attention is put on aspects of international and bilateral cooperation in case of emergency situation with transboundary imapct in order to identify gaps and areas for further improvement.

Based on the conclusions from 6-th Review Meeting of the parties of Convention on Nuclear Safety and lessons learned from Fukushima accident the proposal of Atomic Law amendment were developed in following topics:

- Expanding the scope of training program for emergency workers (both off-site and off-site)
- Ensuring preparedness for and response to multi-unit emergency event – (facilities of emergency preparedness category I and II)
- Ensuring harmonized emergency plans and response measures on facility, regional and national levels
- Ensuring cooperation and harmonized approach with neighbouring countries in areas emergency preparedness category V

Moreover, in order to support achievement of further harmonization of response (challenge 2 identified during 6th Review Meeting for all Member States), Poland participates in international initiatives focused on this issue, including HERCA activities.

Article 17. Siting

Each Contracting Party shall take the appropriate steps to ensure that appropriate procedures are established and implemented:

i. for evaluating all relevant site-related factors likely to affect the safety of a nuclear installation for its projected lifetime;
ii. for evaluating the likely safety impact of a proposed nuclear installation on individuals, society and the environment;
iii. for re-evaluating as necessary all relevant factors referred to in sub-paragraphs (i) and (ii) so as to ensure the continued safety acceptability of the nuclear installation;
iv. for consulting Contracting Parties in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation and, upon request providing the necessary information to such Contracting Parties, in order to enable them to evaluate and make their own assessment of the likely safety impact on their own territory of the nuclear installation.

17.1. Evaluation of site related factors

Atomic Law (Article 35b) provides that nuclear facilities shall be located within an area which ensures that nuclear safety, radiological protection and physical protection requirements are fulfilled during commissioning, operation and decommissioning of the facility, and that emergency measures can be effectively implemented in response to any radiation emergency.

According to the Atomic Law the licence holder (investor) being liable for nuclear safety, should independently evaluate the terrain for the prospect site of a nuclear facility using methods of evaluation which yield quantifiable results and appropriately reflect the actual conditions of such terrain. Such an evaluation is the prerequisite for selecting the site for a nuclear facility, and concerns:

1) seismic, tectonics, geological, geo-engineering, hydrogeological, hydrological and meteorological conditions;
2) man-made external incidents;
3) external incidents attributed to the forces of nature;
4) population density and land development;

5) conditions for the employment of emergency measures in response to radiological emergency;

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

In accordance with Article 35b point 4 of the Atomic Law on 10th of August 2012, Regulation by the Council of Ministers on detailed scope of assessment with regard to land intended for the location of a nuclear facility, cases excluding land to be considered eligible for the location of a nuclear facility and on requirements concerning siting report for a nuclear facility, came into force (hereinafter called Siting regulation).

List of site related factors is covered by § 2 of Siting regulation. Excerpt from § 2 of Siting regulation is provided below.

"§ 2 .A detailed scope of assessment with regard to land intended for a location of a nuclear facility shall include:

1) information from the field of seismology and tectonics, including inter alia seismic shocks, faults;

2) information from the field of geological and engineering conditions including inter alia geological and engineering conditions and their changes, intensity of erosion and accumulation processes, stability of existing scarps and slopes ;

3) information from the field of hydro-geological conditions including underground waters, filtration features of ground, physical and chemical features of underground waters, prognosis concerning changes of dynamics of underground waters;

4) information from the field of hydrology and meteorology including inter alia flooding threats and history, impact of different period of precipitation, extreme atmospheric phenomena, values (including extremes) of atmospheric and hydro-meteorological variables, impact of long periods of drought on the system of underground and surface waters

5) information from the field of external events being the result of human activity including i.a. transport infrastructure, distance from a nuclear facility to active and planned military facilities, potential threat to a nuclear facility posed by industrial plants and installations, acts of terrorism or sabotage, telecommunication devices

6) information from the field of external events being the result of the forces of nature including i.a. risk of seasonal loss or deterioration of capacity of nuclear facility's cooling systems, natural fire threat

7) analyses concerning pace, amount and paths of dispersing of radioactive substances outside the nuclear facility and the possibility to carry out intervention measures in case of radiation emergency under normal operating conditions, predicted operating events and emergency conditions

8) information from the field of population density and land management

9) survey of ground geological structure

10) distribution of radioactive isotopes' concentration in ground, surface waters, underground waters and in the atmosphere and analysis of distribution of ionizing radiation dose rate valid as of the day when the land assessment is carried out."

Concerning those topics PAA (with help from contracted experts and organizations) has prepared 3 regulatory guides in 2013-2014:

1. "Technical recommendations of the President of the National Atomic Energy Agency concerning the assessment of tectonic stability of substrata and seismic activity of faults with reference to locations of nuclear facilities",
2. "Technical recommendations of the President of the National Atomic Energy Agency concerning the assessment of geological, engineering and hydrogeological conditions for locations of nuclear facilities",
3. Technical recommendations of the President of the National Atomic Energy Agency concerning the assessment seismic activity of substrata with reference to locations of nuclear facilities".

There are works ongoing on development of another regulatory guides for siting process.

Some other provisions for site related factors affecting the safety of nuclear installation are provided by the Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design(hereinafter called Design regulation). § 45 of Design Regulation states that in multi-unit nuclear power plants the systems and components of construction and equipment important for ensuring nuclear safety and radiological protection cannot be shared by two or more reactors, unless it is demonstrated that for all reactors, in operational states, including maintenance activities in the scope of operation, repairs, modernisation and during the considered accidents, the requirements on nuclear safety and radiological protection shall be met, and in the event of a severe accident of one reactor, the orderly shut-down, cooling and discharge of post-shut-down heat will be ensured for the remaining reactors. § 49 of the Design regulation sates that design of the nuclear power plant shall take into account its mutual interaction with the power grid, including independence and the number of power lines connected to the nuclear power plant, possible fluctuation and anticipated interference in voltage, mains frequency and system failure, from the viewpoint of ensuring the necessary reliability of power supply to the nuclear power plant systems important for nuclear safety and radiological protection. § 47 - The spatial layout of the nuclear facility and the design solutions of nuclear facility buildings shall permit the effective control of access and the movement of people, equipment and materials onto the premises of the nuclear facility, including workers and emergency service vehicles, with particular consideration being given to protection against the unauthorized access of persons and the unauthorized introduction of objects. Nuclear facility shall be equipped with alarm systems and means of communication which also permit, under emergency conditions, the communication of warnings and instructions to people on the premises of the nuclear facility and informing persons and entities beyond the nuclear facility in keeping with the plant emergency procedure plans.

Design provisions used against:

- fire, explosion etc. – provisions are stated in the chapter 8 of the section IV of the Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design called **Requirements on the fire protection and the prevention of explosions**. Systems and elements of construction and equipment of the nuclear facility important for ensuring nuclear safety and radiological protection shall be designed and distributed so as to minimise the probability of fire and explosion caused by external

or internal events. Redundancy, diversity and physical separation of those systems are required. Fire barriers, fire detection systems, fire alarms and the extinguishing of fires at the nuclear facility shall be designed on the basis of the analyses on fire threat of the nuclear facility indicating required fire resistance, need for application and output.

- Aircraft crash – provisions are stated in the § 33 of the Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design. Design solutions ensuring NPPs safety in case of a large civilian aircraft crashing into it are required. Design should ensure that with limited operator's actions: the reactor core continues being cooled or the primary reactor containment remains intact and the cooling of spent nuclear fuel or the integrity of the spent nuclear fuel pool is maintained. Moreover § 67 of this regulation provides that two reactor containments should be constructed. Presence of the secondary containment increases nuclear safety and resistance to aircraft crash.
- External flooding – provisions are stated in the §23 of the Design regulation. In the event of locating the nuclear facility in the areas where the probability of flooding is once every 1000 years or more than once every 1000 years, the nuclear facility shall be designed in a manner to prevent the negative consequences brought about by floods or flooding. When designing anti-flooding protection for a nuclear facility, consideration shall be given to the maximum water surface ordinate with the probability to occur once every 1000 years. (it follows the European Commission recommendation from post-Fukushima stress tests):
- Severe weather conditions, earthquakes, heavy rains:
  Following provisions can be found in the Polish regulations:
  Siting regulation:
  § 5. The land shall not be considered to fulfill location requirements with regard to a nuclear facility location in case of the following factors
  2) in the location ground of a nuclear facility in the distance which is less than 20 km from the borders of planned placement of a nuclear facility there is an active fault or fault in relation to which the probability of activation is more than once in 10,000 years and such activation could cause a threat to nuclear safety of a nuclear facility (it follows the European Commission recommendation from post-Fukushima stress tests):
  3) in the location region there has been an earthquake of 8 grade in EMS-98 scale within the last 10,000 years or there is the probability of earthquake with the same scale which is more than once in 10,000 years
  4) there is the possibility of earthquake with the occurrence probability being more than once in 10,000 years and with the scale below 8 EMS-98, which will prevent the safe operation of a nuclear facility;
  Design regulation:
  §21. 1. Nuclear facility shall be designed so as to ensure its nuclear safety in case of the occurrence of seismic events and their consequences.
  3. When designing a nuclear facility, consideration shall be given to design seismic events with the shock repetition once every 10 000 years, which generates the highest horizontal ground acceleration spectra. The design seismic event shall define: the shock type and mechanism, its location, magnitude, duration, spectral

parameters, vertical and horizontal ground acceleration spectra and the seismic moment tensor.

4. When a nuclear facility is in danger of an induced earthquake taking place, natural and induced earthquakes scenarios shall be taken into account for the purpose of identification of design seismic event.

5. Nuclear facility design solutions shall ensure that in case of a design seismic event taking place, referred to in Section 3, systems and components of construction and equipment of the nuclear facility which are important for performing fundamental safety functions shall resist stress arising from such event, so that the nuclear facility could attain the state of safe switch-off.

6. The requirement defined in Section 5 shall be performed in particular by seismic classification of systems and components of construction and equipment of the nuclear facility depending on their required resistance to seismic stress, taking into account implemented safety functions, and by defining the appropriate technical requirements depending on seismicity class.

§22. 1. The nuclear facility design shall take into account the capability of its systems and components of construction and equipment important for performing fundamental safety functions, to resist the consequences of seismic events which are more severe than design seismic event, so as to demonstrate that they will not be suddenly damaged, even in the case of design stress being slightly exceeded.

2. In designing the facility for seismic events, an assumption will be made for the loss of electrical power supply to the nuclear facility from external power grids as a result of seismic shocks; including pre-emptive shocks and aftershock.

- External events and events resulting from human activities are taken into consideration in determining the Postulated Imitating Events adopted for the performance of the safety analyses.

Regulatory control and review – as Poland does not have any Nuclear Facilities according to definition in Article 2 of the Convention, therefore no control or review have been carried.

Siting regulation was based on the number of relevant IAEA safety standards including NS-R-3, series of NS-G's from 3.1 to 3.6 (now surpassed by newer documents). Taking this into account as well as above presented excerpt from regulations it can be sated that Polish provisions of Law are following Vienna Declaration and some of the lessons learned from Fukushima Accident.

17.2. Impact of the installation on individuals, society and environment

When applying for the licence for construction of Nuclear Power Plant operator will have to provide :

a. Decision on Environmental Conditions issued by General Directorate of Environmental Protection after PAA's president opinion
b. Preliminary Safety Report including chapter 13 - Impact of the nuclear facility on the environment.

Moreover § 9 of Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design provides that nuclear facility design shall ensure the limitation of releases of

radioactive substances beyond the reactor containment in case of the occurrence of accident conditions so that in the event of:
1) design basis accidents, there is no need to take any intervention measures beyond the limits of the restricted-use area;
2) extended design conditions, there is no need to take:
a) early intervention measures beyond the limits of the restricted-use area of the nuclear facility during the releases of radioactive substances from the nuclear facility,
b) medium-term intervention measures at any time whatsoever beyond the limits of the emergency planning zone,
c) long-term intervention measures beyond the limits of the restricted-use area of the nuclear facility

In the nuclear facility design consideration shall be given to the interaction between the nuclear facility and the environment (§ 17 of the Design regulation). The characteristics of the planned site and the region of the nuclear facility location should determine the impact of the nuclear facility on the environment. The interactions should in particular take into consideration:
1) defining the transfer of radioactive substances to persons belonging to the general population and the environment, including the spreading of radioactive substances in the air, surface water and groundwater;
2) in terms of possible impact on intervention measures and risk assessment for given persons belonging to the general population and the population as a whole in case of accident, such as:
a) population distribution around the nuclear facility,
b) the use of land and water,
c) communication routes.
To ensure the nuclear safety and radiological protection the nuclear facility design shall provide for components of equipment used for the purpose of monitoring ionising radiation in the operational states and during and after the considered accidents (§ 123 of the Design regulation).

On May 25, 2016 General Directorate for Environmental Protection (GDOŚ) issued a decision on the scope of the report of environmental impact assessment for identified by PGE EJ 1 variants locations of the first Polish nuclear power plant, i.e. "Lubiatowo - Kopalino" (municipality Choczewo) and "Żarnowiec" (municipality Krokowa and Gniewino).

17.3.Re-evaluation of site related factors

Not applicable as Poland does not have any Nuclear Facilities according to definition in Article 2 of the convention.

17.4. Consultation with other Contracting Parties likely to be affected by the installation

To ensure nuclear and radiological safety, the Republic of Poland signed a number of international bilateral agreements. Agreements concerning early notification of nuclear accident and exchange of information and experience were executed with the neighbouring countries under international Convention on Early Notification of Nuclear Accident, i.e. with 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 (30 July 2009).

Due to the fact that the number of nuclear power plants operate in close vicinity of the territory of Poland, the cooperation with nuclear regulators of the neighbouring countries, conducted in accordance with the mentioned intergovernmental agreements, is an essential element of Polish radiological safety. While assessing possible radiation events, partners of the said agreements use consolidated criteria provided for by so called the International Nuclear Event Scale - INES, which was developed by the IAEA.

In accordance to Polish Nuclear Power Programme number of trans-boundary consultations were held and they delayed the approval of the PNPP. Specific information can be found in the Annex no. 4 section - Cross-border consultations of the Polish Nuclear Power Program and the Environmental Impact Assessment.

Article 18. Design and construction

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

- ***i. the design and construction of a nuclear installation provides for several reliable levels and methods of protection (defence in depth) against the release of radioactive materials, with a view to preventing the occurrence of accidents and to mitigating their radiological consequences should they occur;***
- ***ii. the technologies incorporated in the design and construction of a nuclear installation are proven by experience or qualified by testing or analysis;***
- ***iii. the design of a nuclear installation allows for reliable, stable and easily manageable operation, with specific consideration of human factors and the man-machine interface.***

General provisions for the nuclear facility design, which include prevention of accidents, are provided by Article 36c of the Atomic Law. More detailed requirements are contained in the Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design. This regulation is based on IAEA Safety Standards (in particular SSR 2/1), WENRA recommendations, European Utility Requirements for LWR NPPs and relevant regulatory provisions and requirements binding in particular UE countries, and as such it complies with the principles of the Vienna Declaration on Nuclear Safety. Furthermore siting requirements are contained in Regulation of the Council of Ministers of 10 August 2012 on detailed scope of assessment with regard to land intended for the location of a nuclear facility, requirements concerning siting report for a nuclear facility.

18.1. Prevention of early or large radioactive releases (implementation of 1st and 3rd principle of Vienna Declaration on Nuclear Safety in regulations)

§ 2 section 2 of the Regulation on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design provides that nuclear facility shall be designed in a manner which ensures limiting the radiation consequences of any possible accident without significant degradation of the reactor core, taken into account in the nuclear facility design, so as to prevent the evacuation of the population and long-term limitations in the use of land and waters around the nuclear facility.

Furthermore § 9 section 2 of this Regulation says that nuclear facility design shall ensure the limitation of releases of radioactive substances beyond the reactor containment in case of the occurrence of accident conditions so that in the event of extended design

conditions, there is no need to take neither early intervention measures beyond the limits of the restricted-use area of the nuclear facility during the releases of radioactive substances from the nuclear facility, nor long-term intervention measures beyond the limits of the restricted-use area.

18.2. Implementation of defence in depth

General provisions for the defence in depth concept are provided by the Atomic Law. Article 36c section 2 says that nuclear facility design shall take into account the sequence of safety levels to prevent deviations from normal operating conditions, predictable operating emergencies and design basis accidents, as well as severe emergencies unaccounted for in the nuclear facility design, and if any of the foregoing deviations, incidents or emergencies cannot be prevented – to control them and to mitigate radiological impact of the emergency. This requirement is described broader in the Regulation on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design. § 3 of this regulation develops five safety levels, as well as functions and actions that should be taken at each level. Sequence of protective barriers ensuring the maintenance of radioactive substances at given points of the nuclear facility and preventing their uncontrolled release to the environment, such as: nuclear fuel material (fuel matrix), fuel cladding, pressure boundary of the reactor cooling circuit and reactor containment need to be implemented in the nuclear facility design. In all circumstances, fundamental safety functions of the plant should be performed.

Defence in depth is also included in other requirements for facility design. General requirements provides that the design shall ensure:

1) high level of quality of the nuclear facility in order to minimize the occurrence of failures and deviations from normal operation and to prevent accidents;

2) technical solutions for controlling nuclear facility behaviour during and after the occurrence of a postulated initiating event, with the use of the built-in safety properties of the nuclear facility and appropriate components of the nuclear facility equipment

3) nuclear facility control by applying automatic actuation of safety systems in a manner limiting operator's activities in the earlier phase of the postulated initiating event, as well as the control of the nuclear facility by the operator;

4) as far as it is practically possible, equipment and procedures permitting the controlling of the course of accident and limiting its consequences;

5) multiple technical solutions in order to ensure the performance of each of the fundamental safety functions, attaining in this manner protective barrier effectiveness and limiting the consequences of postulated initiating events.

The nuclear facility design shall apply solutions concerning safety level sequences in order to prevent:

1) the strain of the integrity of protective barriers;

2) the failure of one or more protective barriers;

3) the failure of the protective barrier resulting from the failure of another protective barrier or system, component of construction or equipment of a nuclear facility;

4) any possible negative consequences caused by human error during nuclear facility operations or during the performance of maintenance activities concerning operations, including nuclear facility repairs and modernization.

18.3. Incorporation of proven technologies

Under the provision of the Article 35b of the Atomic Law it is required that in the design and construction process of a nuclear facility, no solutions or technologies shall be used which have not been demonstrated to be appropriate in practice in other nuclear facilities, or by means of tests, studies and analyses.

Integrated management system need to be presented by the licensee when applying for the licence to conduct activities involving exposure and consisting in construction, commissioning, operation or decommissioning of nuclear facilities. Producers and suppliers of nuclear facility systems, construction elements and/or installations, as well as contractors for construction works at the nuclear facility shall have appropriate quality systems implemented for the services they provide.

During construction and manufacture of the facility systems, installations and components nuclear regulatory inspectors and inspectors from Office of Technical Inspection will conduct inspections to ensure that high technological standards are met at every step of the construction. Experience of the Office of Technical Inspection inspectors will be a big asset in the inspection process.

Equipment qualification is also required. The safety system necessary for the nuclear facility to attain a safe shut-down and remain in this state shall be designed so as to permit it to perform its functions when fulfilling the single failure criterion and even when any other component of this system or of the auxiliary system required for it to function is excluded from operation.

Requirements regarding reliability and periodic testing of the control and measuring devices and systems are provided by the Regulation on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design.

18.4. Design for reliable, stable and manageable operation

§ 43 of the Regulation on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design provides that nuclear facility shall be designed so as to minimize the possibility and limit the consequences of human error, with particular consideration being given to the spatial layout of the nuclear facility and to ergonomics. It should be ensured that operator has conditions provided to undertake needed actions. Nuclear facility design solutions shall minimise the probability of situations which require intervention measures by the nuclear facility operator over a short period of time; however, if such intervention measures are taken by the operator, the solutions shall ensure that:

1) the operator has at his disposal sufficient time to take the right decisions and measures;

2) the necessary information for the operator to make the right decision is presented in a simple and unequivocal manner;

3) following the accident, in the main control room or the back-up control room and in the route leading to the back-up control room, there is an acceptable occupational environment in terms of radiological protection and work health and safety.

§ 44 of the Design regulation gives special attention to the design of the main control room and back-up control room in accordance to human factors and man-machine interaction. Back-up control room is required in the design of the NPP and should be physically separated from main control room, as to ensure the safety of the plant in case if all the necessary actions for ensuring safety cannot be undertaken from the main control room. Control room shall be designed to provide operators with comprehensive picture of the state and functioning of the nuclear facility and complex but easy to understand information.

Probabilistic safety analysis will be conducted and included in the Safety Analysis Report and will take into account inter alia possible workers errors.

18.5. Provisions concerning Fukushima Daiichi accident lessons learned

Many solutions which are now found as lessons learned from Fukushima Daiichi accident were already implemented in Atomic Law and the working version of Regulation on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design when the accident happened.

Based on the lessons listed in The Fukushima Daiichi Accident Report by the IAEA Director General, these are the most important provisions regarding design and construction:

1) As mentioned above back-up control room and the route leading to it shall have acceptable occupational environment after an accident occurs.

2) § 99 of the Design regulation gives special attention to sources of emergency power supply for the nuclear facility. These sources shall be selected in a manner to ensure reliable operation after the anticipated operational occurrences of the systems and components of equipment important for ensuring nuclear safety and radiation protection.
Furthermore In the event of a loss of alternating current supplied externally, the internal sources of power supply to the nuclear facility with alternating current, with the exception of those sources of supply, referred to in Section 4, shall ensure the power supply of systems and components of equipment important for ensuring nuclear safety and radiation protection, for at least 7 cycles of 24-hours in operational states and during and after the considered accidents.
Besides internal sources of power supply the nuclear facility design shall also provide for an alternative source of supplying the facility with alternating current to be used in case of unavailability of internal sources of power, in particular transportable or portable power generators or combined systems for supplying emergency power to a nuclear facility.

3) According to § 78 control and measuring devices used in nuclear facility, shall be qualified in keeping with environmental conditions which could occur in given nuclear facility states, ensuring that these devices are appropriate for nuclear facility parameter measurements in accident conditions.

4) § 58 to § 66 of the Design regulation are dedicated to reactor cooling circuit. Among others it provides that the design of a nuclear power plant shall provide for the application of the emergency reactor core cooling systems in order to restore and maintain nuclear fuel cooling during in accident states, even in the event of the loss of the integrity of the pressure boundary of the reactor cooling circuit.

5) Among other more specific requirements regarding containment Design regulation provides that the design solutions of reactor containment and its related safety systems shall in particular ensure the fulfilment of accident scenarios including nuclear meltdown, selected on the basis of engineering judgment and probabilistic safety analyses. Nuclear power plant and research reactor shall be designed so as to prevent the occurrence of severe accidents, which could lead to a premature failure of the primary reactor containment, or it shall be demonstrated that the probability of occurrence of such accidents is so small that it is not necessary to include it in the design. The design of a nuclear power plant and research reactor shall provide for solutions ensuring limitation, by means of the reactor containment system, of the consequences of severe accidents involving reactor core degradation.

6) §76 of the Design regulation states that reactor containment system design shall provide for, as required, systems used for limiting, reducing and controlling the quantities of products of fission, hydrogen, oxygen and other substances, which may be released into the reactor containment. Those systems should be designed with the appropriate degree of multiplicity (redundancy) and with appropriate mutual connections, with the purpose of ensuring that each safety group may fulfill the required safety function, with electricity supply from internal facility sources or from the external power grid, assuming the occurrence of a single failure. In order to reduce the concentration of flammable gases in the reactor containment, application shall be made of systems or components of equipment which do not require electricity.

Article 19. Operation

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

- ***i. the initial authorization to operate a nuclear installation is based upon an appropriate safety analysis and a commissioning programme demonstrating that the installation, as constructed, is consistent with design and safety requirements;***
- ***ii. operational limits and conditions derived from the safety analysis, tests and operational experience are defined and revised as necessary for identifying safe boundaries for operation;***
- ***iii. operation, maintenance, inspection and testing of a nuclear installation are conducted in accordance with approved procedures;***
- ***iv. procedures are established for responding to anticipated operational occurrences and to accidents;***
- ***v. necessary engineering and technical support in all safety-related fields is available throughout the lifetime of a nuclear installation;***
- ***vi. incidents significant to safety are reported in a timely manner by the holder of the relevant licence to the regulatory body;***
- ***vii. programmes to collect and analyse operating experience are established, the results obtained and the conclusions drawn are acted upon and that existing mechanisms are used to share important experience with international bodies and with other operating organizations and regulatory bodies;***
- ***viii. the generation of radioactive waste resulting from the operation of a nuclear installation is kept to the minimum practicable for the process concerned, both in activity and in volume, and any necessary treatment and storage of spent fuel and waste directly related to the operation and on the same site as that of the nuclear installation take into consideration conditioning and disposal.***

As Poland does not have any Nuclear Installations by the definition of Nuclear Safety Convention presented below information is based mostly on excerpts from Atomic Law and relevant regulations. Regulation of the Council of Ministers of 11 February 2013 on requirements regarding commissioning and operation of nuclear installations is based on IAEA Safety Documents (SSR – 2/2, NS-G-2.9, NS-G-2.2, GS-R-3) as well as relevant WENRA documents and regulations and guides from other countries. Preparation of relevant Polish regulations therefore meet the third principle of the Vienna Declaration.

19.1. Initial authorization

Article 4 of the Atomic Law states that separate licences for commissioning and operation are required. A list and scope of documents that are required at this stage of licensing process is provided by Regulation of the council of ministers of 10 September 2015 on the documents required with the application for the licence for activities involving the exposure to ionizing radiation or with the notification of such activities. Most important documents required at commissioning stage (there are 38 documents specified in Regulation):

- Commissioning Safety report including safety analysis, based on the Preliminary Safety Report with updates, clarifications and supplements arising from construction phase, including information about system, structures and components as built and every other change as important to nuclear safety and radiological protection
- commissioning programme and procedures
- operational limits and conditions
- nuclear fuel reloading program, supported by appropriate neutronic and thermal-hydraulic calculations for first fuel cycle
- operational procedures
- list of planned pre-operational tests
- training programme for NPP staff
- updated nuclear facility decommissioning programme
- description of the structure and activities of separated division or team responsible for maintaining knowledge about plant's project and design throughout plant's lifetime

Most important additional documents required at operation stage:

- Operation Safety Report
- Commissioning report, with pre-operational test results
- Statement of adequacy of human resources to perform activities important for nuclear safety and radiological protection
- Operation programme, including electricity production programme and plan of repairs for at least 10 years

Article 37a. 1. of the Atomic law states that "nuclear facility shall be commissioned and operated in a manner that will ensure nuclear safety and radiological protection of personnel and general public, in accordance with the licence issued by the Agency's President and the implemented integrated management system." Point 2 of Article 37a requires the licensee to submit commissioning programme to PAA's President for approval. The programme shall list all pre-commissioning tests of nuclear facility systems, construction elements and installations to be completed, and in particular:

1) pre-commissioning tests, including tests required under the technical inspection regulations;
2) fuel load and sub-criticality tests;
3) preliminary criticality tests and low power output tests;
4) power output tests.

Results of nuclear facility commissioning tests at every stage need to be submitted the Agency's President. The Agency's President may suspend nuclear facility commissioning if the results of commissioning tests indicate any risks for nuclear safety or non-compliances with the nuclear safety requirements.

Further requirements are provided by Regulation of the Council of Ministers of 11 February 2013 on requirements regarding commissioning and operation of nuclear installations.

During construction, commissioning and operation phase regulatory inspectors are authorized to inspect producers and suppliers of nuclear facility systems, structures and components as well as contractors for systems, components and works important for the nuclear safety, radiological protection and safe operation of installation (Article 37.1. of Atomic Law).

19.2. Operational limits and conditions

Every licence specify the conditions of activities covered by the licence, including operating limits and conditions (Article 39g). Requirements for operating limits and conditions for commissioning and operation of nuclear facilities are provided by Regulation of the Council of Ministers of 11 February 2013 on requirements regarding commissioning and operation of nuclear installations.

The licensee presents proposed operational limits and conditions with the application for commissioning. The President of PAA has right to modify them, taking into account operational experience or modifications of systems, structures or components, results of new safety analyses as well as scientific and technological developments. Operational limits and conditions are subject to reviews during commissioning and operation of the nuclear facility.

Operational limits and conditions shall include at least:

1) safety limits – defined as "values of these physical and technological parameters which must not be exceeded and which directly impact the condition of protective barriers";
2) limiting settings for safety systems, where safety system settings are defined as "parameter values at which protective devices are automatically actuated in the event of anticipated operational occurrences or accident conditions to prevent safety limits from being exceeded";
3) limits and conditions for normal operation;
4) requirements concerning inspection and surveillance over the systems, structures and components of the nuclear facility important for ensuring nuclear safety and radiological protection;
5) minimum required staffing of operational personnel, including the control room operators.

Safety limits shall be established with the application of conservative approach taking into account uncertainties of safety analyses. In the case of exceeding safety limits during commissioning or operation of the nuclear power plant or research reactor, the reactor shall be immediately shut down.

Limits and conditions for normal operation shall determine conditions for the safe operation of the nuclear facility in all the modes of its normal operation. They shall include in particular:

1) ranges and rates of permissible changes of physical and process parameters of the nuclear facility;
2) requirements for functional availability and effectiveness of the systems and components of the nuclear facility important for ensuring nuclear safety and radiological protection so that
they could fulfil safety functions in particular conditions;
3) measures which should be taken in the case when the requirements as referred to in Item 2 are not met and the identification of time period in which these measures should be taken.

Description of operational limits and conditions shall be made available to the operators of nuclear facility's control room in a separate document (technical specification for commissioning and operation respectively). Furthermore Regulation By 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 states that theoretical training for position of operator include inter alia "Limits and operating conditions and nuclear regulatory authority's requirements".

19.3. Procedures for operation, maintenance, inspection and testing

Requirements for appropriate procedures are provided by Regulation of the Council of Ministers of 11 February 2013 on requirements regarding commissioning and operation of nuclear installations and Regulation of the council of ministers of 10 September 2015 on the documents required with the application for the licence for activities involving the exposure to ionizing radiation or with the notification of such activities.

Operation of the nuclear facility shall be conducted in accordance with operating procedures developed, verified, approved, modified and revoked according to the principles set out in the integrated management system. Operating procedures of the nuclear facility shall be developed on the basis of the design documentation, in particular the safety analysis report, also on the basis of operational limits and conditions and the results of nuclear facility commissioning. Operating procedures of the nuclear facility shall be developed for particular states of the nuclear facility. Operating procedures of the nuclear facility shall be made available to employees of the nuclear facility on the permanent basis, and to the nuclear regulatory bodies – on demand. The Agency's President may order introducing changes in the operating procedures if the reasons for nuclear safety or radiological protection require so.

Regulation also obliges the operator to establish program of maintenance, testing, surveillance and inspection of the systems, structures and components of the nuclear facility important for ensuring nuclear safety and radiological protection with relevant procedures. This programme will need to include systematic assessments in order to confirm that the systems, structures and components are capable of performing their functions in the operational states and in accident conditions and management of aging processes. It subject to periodic reviews on the basis of operating experience. Specific scope of the programme and following procedures will be prepared by the operator during commissioning phase.

19.4. Procedures for responding to operational occurrences and accidents

Operating procedures of the nuclear facility shall be developed for particular states of the nuclear facility. That means that both at commissioning and operation phase operator need to have procedures for normal operation, procedures for anticipated operational occurrences and emergency procedures. More specific guides may be further developed by PAA.

19.5. Engineering and technical support

During the construction of Olkiluoto 3 in Finland significant share of work was done by Polish companies e.g. Polbau, Elektrobudowa, Energomontaż-Północ, KMW Engineering. Thanks to this experience big part of building can be done with the help of Polish engineers and companies. However there are very few experts in the field of design of nuclear power reactors and as well there is lack of experienced operational staff. The main scientific support for the Polish Nuclear Power Programme is National Centre for Nuclear Research in Świerk (NCBJ). NCBJ is operator of polish research reactor MARIA.

Due to these reasons PGE EJ 1, which is a special purpose company responsible for preparing the investment process and construction of the first nuclear power plant in Poland, in May 2013 signed an agreement with Polish universities to promote education and research in the field of nuclear power. Both PGE EJ1 and PAA recognize their need to have a strong backup in consultants, contractors and technical support organizations and are looking for the ways of cooperation both in Poland and abroad.

19.6. Reporting of incidents significant to safety

The Atomic Law Act states that “the head of organizational entity conducting activities involving exposure and consisting in commissioning, operation or decommissioning of nuclear facilities shall immediately notify the PAA President, the regional governor, district or municipal authorities competent for the area where the facility is located, as well as municipal authorities of the adjacent areas on all emergencies related to actual or potential nuclear hazards”. He also shall publish or update information concerning hazardous nuclear emergencies within the last 12 months on the facility’s official website and shall forward it to the Agency’s President (Article 35a).

In the event of radiation emergency, the head of the organizational entity shall secure the emergency site and shall notify immediately the Agency’s President and additionally, in justified cases, shall notify also other organizations and services, in accordance with the on-site emergency plan. The licence will specify the conditions concerning operating emergencies and emergency conditions which are required to be reported to nuclear regulatory bodies.

19.7. Operational experience feedback

According to Article 37c of Atomic Law head of the organizational entity operating NPP will keep records on the day-to-day operation of the nuclear facility; introduce technical and organizational solutions to be able to collect and analyse on an ongoing basis the nuclear facility operating parameters which are important for the nuclear safety and radiological protection, in consideration of the operating experience so far. Operator is also obliged to regularly forward the nuclear facility operating parameters which are important for the nuclear safety and radiological protection to the PAA’s President**.**

Regulation of the council of ministers of 10 September 2015 on the documents required with the application for the licence for activities involving the exposure to ionizing

radiation or with the notification of such activities obliges the licensee to include in Safety Analysis Report information about the programme of operational experience feedback based on operating experience of the plant and other nuclear facilities, especially those of similar type.

The specifics of this programme are provided by Regulation of the Council of Ministers of 11 February 2013 on requirements regarding commissioning and operation of nuclear installations, which also provides several further requirements. In order to ensure a proper level of nuclear safety and radiological protection at the stage of commissioning and at the stage of operation of a nuclear facility systematic analyses shall be conducted with regard to operating experience, development of international safety requirements, technological developments and new knowledge, and conclusions from these analyses shall be used to improve the safety state of the nuclear facility (§ 8.7). During commissioning and operation of the nuclear facility it shall be verified that the integrated management system has been implemented correctly in the scope of radiological protection and it shall be assessed whether this system meets the set objectives, and, if necessary, suitable corrective and updating measures shall be taken to ensure its implementation in the light of operating experience (§ 9.3). Program of maintenance, testing, surveillance and inspection of the systems, structures and components of the nuclear facility is subject to periodic reviews on the basis of operating experience (§37.3). During maintenance, modernization or modification outages of the nuclear facility the performance of comprehensive assessments should be made in order to draw conclusions and lessons learned to be used for future maintenance, modernizations and modifications (§45.2).

Experience from the operation of the nuclear facility shall be subject to systematic assessment. It shall refer in particular to extraordinary events in the nuclear facility in order to identify their causes.Information resulting from the examination of events important from the viewpoint of nuclear safety or radiological protection, and also conclusions drawn from this examination shall be submitted to the employees of the nuclear facility. In order to draw conclusions regarding the operation of the nuclear facility, information shall be obtained and assessed with regard to operating experience of other domestic and foreign nuclear facilities, especially those of similar type. In order to detect states, situations or deficiencies which could potentially lead to deviations from the normal operation, assigned employees of the nuclear facility shall conduct appropriate analyses of operating experience so that it shall be possible to take necessary countermeasures to prevent such events. Internal procedures which are applicable in the nuclear facility shall oblige the nuclear facility's employees to notify the head of the organizational entity [licensee] about any events related to nuclear safety or radiological protection and shall also encourage employees to inform about the events which potentially could lead to adverse effects from the viewpoint of nuclear safety or radiological protection. Data on operating experience shall be collected, documented and kept in the manner enabling their easy retrieval and obtaining and performing the evaluation by authorized employees of the nuclear facility (§44).

Suggestion from IRRS mission report regarding operational experience feedback "The regulatory body PAA should establish an internal process for using the feedback from operating experience, incidents and accidents in Poland as well as in other countries". Actions has been fully implemented and described below.

Since the end of 2013 PAA has gained access to 3 databases consisting records and information about operational experience in various countries. Those are CONEX, CLEARINGHOUSE and IRS databases. Based on the information provided in those databases small team in PAA is preparing "quarterly reports on operational experience in NPPs" that is intended mainly for the employees of PAA's Nuclear Safety Department as the opportunity to learn about problems, occurrences, events at NPPs in different phases of the lifetime and regulatory approach in other countries. Every operational experience that was chosen to be described in the quarterly report is explained and followed by the conclusions important for the PAA. As Poland is still at the stage before tendering process for technology supplier, the most important events that are analyzed are those arising during the stage of construction. CONEX database is especially useful as it contains a lot of information about experiences during construction of new projects with modern reactor types that may be considered in Poland. PAA has found the usage of all databases as a great tool to prepare for upcoming challenges during Polish Nuclear Power Programme as it allows to learn what kind of problems may arise, what to consider during inspections and assessments, how vendors, contractors and regulatory bodies respond to problems or events. It also gives the opportunity to attend the annual meetings of database users, which helps to improve international cooperation in the matter of sharing operational experience. In future PAA will urge operator to participate in international cooperation on sharing operational experience and invite universities, technical support organizations etc. to use the databases.

Based on Polish experience of usage of abovementioned databases as well as hosting and participating in IRRS mission and considering one of the challenges from 6th Review Meeting of CNS Contracting Parties the following findings on how to "make better use of operating and regulatory experience and regulatory peer review services" were formulated:

- Embarking countries should gain access to international databases consisting records and information about operational experience (especially concerning construction of new reactors) as early as possible in their National Nuclear Power Programme;
- The knowledge about events and operational experience coming from databases should be shared with technical staff of regulatory body and as possible with other stakeholders;
- Publicly available reports form international peer-review missions constitute unique source of good practices, suggestions and recommendations which are to some extent applicable also for other countries.

19.8 Management of spent fuel and radioactive waste on the site

Article 50 of Atomic Law states that Radioactive waste and spent nuclear fuel shall be stored in conditions allowing their segregation and in a manner ensuring protection of humans and environment. Spent nuclear fuel, subsequent to the cooling period in the reactor pool, shall be stored in a wet storage facility (in aqueous environment) or in a dry storage facility (in inert gas atmosphere), under conditions ensuring that on the spent nuclear fuel element surface the temperature permissible for a given type of nuclear fuel shall not be exceeded, and preventing the occurrence of self-sustaining nuclear fission reaction (preservation of sub-criticality). Furthermore the Regulation on requirements regarding commissioning and operation of nuclear installations states that the collection, segregation, processing, movement and storage, on the facility site, and preparation for transport outside the nuclear facility site of radioactive waste and spent nuclear fuel during commissioning or

operation of the nuclear facility shall be in accordance with the radioactive waste and spent nuclear fuel safe management programme.

Specific requirements for the on-site handling of spent fuel and radioactive waste are listed in the Regulation of the Council of Ministers of 14 December 2015 on radioactive waste and spent nuclear fuel.

3. Concluding summary on the fulfilment of the obligations

Process of implementing Polish Nuclear Power Programme is progressing slowly, there were several amendments to the schedule with the latest presented in Annex no.2. Nevertheless some progress in assessing the proposed sites have been made, Polish Nuclear Power Programme has been adopted by the Council of Ministers in 2014, Atomic Law was amended in 2014 (to incorporate provisions of the Council Directive 2011/70/Euratom on the safe management of spent fuel and radioactive waste) and 3 new specific regulations were issued. Regulatory body PAA has been implementing actions with regard to IRRS action plan, enhancing inter alia its management system, communication strategy, preparing regulatory guides and fully reviewing research reactor's operator application for licence renewal. INIR follow-up mission has been conducted in 2016 and concluded that Poland has implemented all 5 recommendations and 6 suggestions of a 2013 IAEA INIR mission. In addition, the experts found that Poland is already implementing many of the actions that are expected for the next phase of developing its nuclear power programme. More information about IRRS and INIR mission is provided in Introduction.

During the 6th review meeting Poland received four challenges and two suggestions in connection with future plans of introducing nuclear power. Significant effort was made to introduce integrated management system and human resources development plan in PAA, which was also a part of IRRS action plan. Please refer to subsections 8.1.6 and 8.1.8 for details. Approach to lessons learned from Fukushima accident was more detailed in preparing this report, with specific information on requirements from Atomic Law and regulations cited in reporting on articles 14, 16, 17 and 18 especially. Dedicated subsection in article 18 was created to reflect on Polish regulations compliance with Fukushima Daiichi Accident Report by the IAEA Director General. Information about progress of Polish Nuclear Power Programme – which was one of the challenges - is presented in Annex no.2. Last suggestion concerned encouragement for PAA to consider establishing a relationship with the regulator of the vendor country early in the process. As there is still no vendor, this suggestion could not be fully followed, nevertheless PAA signed a number of agreements with various regulatory bodies, that resulted in fruitful cooperation. Please refer to reporting on article 8 for more details.

Vienna Declaration on Nuclear Safety principles will be one of the fundamentals in implementing Polish Nuclear Power Programme. In reporting on relevant articles (14, 17, 18, 19) Poland have presented that Executive Regulations to the Act of Atomic Law are developed based on IAEA Safety Standards, WENRA recommendations and regulations from experienced countries with Nuclear Programmes, therefore this is a good legal basis for introducing nuclear power in accordance with 1st and 2nd principle of Vienna Declaration. Poland will continue this practice in future amendments and in the process of issuing new regulations.

Five challenges were identified at 6th review meeting for all Member States. Poland presented propositions for actions, based on Polish experience, in relevant articles (please refer to introduction for specific information). Propositions for actions on challenge 5 – "How to engage all countries to commit and participate in international cooperation?" are presented below:

- Increasing global understanding that international cooperation is not the necessity but on the contrary it is the **opportunity** to share knowledge, good practices and more importantly reports on mistakes, providing a chance to avoid repeating others' mistakes. IAEA may be cooperator in the efforts to commit all countries to successful collaboration, but equally as important are bilateral agreements between neighboring states and cooperation with countries at the same stage of Nuclear Programme and developed countries that are willing to share experience. The will to improve international cooperation lies with the government, NEPIOs and regulatory management, so the role of experts in the country and worldwide respected organizations such as IAEA is to encourage decision makers to strengthen international cooperation,
- Participation of experts from developing countries in peer-review missions as observers or team members will boost their understanding of importance of international nuclear safety regimes, and facilitate experience sharing with representatives of other countries involved in given peer review.

Based on the presented evaluation, it can be concluded that **Polish regulations and practices continue to be in compliance with the obligations of the Convention** to the extent applicable to Poland, and further progress is underway in the view of Polish nuclear power programme.

Compliance with Convention on Nuclear Safety (and other instruments of international nuclear safety regime) was one of the key criteria when Poland was conducting works on the development national legal and regulatory framework as preparation to introduce nuclear power programme. Consequently in the future during continuation of these efforts, especially in the field of human resources development, CNS guidelines as well as IRRS mission results and principles of Vienna Declaration on Nuclear Safety will be always taken into account.

Annex no. 1 – Nuclear Installations

Installations (other than defined in the article 2(i) of the Convention on Nuclear Safety)

Research reactors

The only Polish **operational reactor „MARIA"** is a high flux **channel-pool type** one, of nominal thermal power **30 MW** (**first criticality date 1974/18/12**), at present operating at about 20 MW thermal power and used mostly to isotopes production, silicon doping and physical experiments. It was operating at the time of entering into force of the Convention, after an extensive process of upgrading. In the years 1999-2002 a process of conversion from 80% to 36% enriched fuel of reactor core was completed. Another conversion, this time from HEU to LEU, took place in the years 2012-2015. At this moment there are only LEU fuel assemblies in the core. The conversion of the reactor core necessitated modernization of the fuel channels' cooling systems which took place in 2013. Main point of this modernization was change of the pumps for new ones.

The facility, **operated by the National Centre for Nuclear Research NCBJ** (former Institute of Atomic Energy IEA and Institute for Nuclear Studies IPJ merged in 2011), on 31 March 2015 was granted with a new licence for operation valid until 2025. The reactor is subject to process of its constant upgrading and accommodation to actual tasks. All principles enumerated in Article 19, concerning its operation are observed. The exchange of experience (art.19 (vii)) is naturally limited as the design of the reactor is very specific.

The spent fuel from this reactor is stored in a technological pool connected to the reactor pool inside the reactor building (AR, wet type of storage).

The first research **reactor "EWA"** (pool type) 10 MW_{th} (first criticality date **1958/06/14**), used for isotopes production and physical experiments in horizontal channels, was shut down and unloaded of fuel in 1995. Its **decommissioning** process, authorized under general permission issued to its **operator (IEA)** - in 1997, recently has reached the end of its **2nd stage**, according to IAEA definition. The spent fuel unloading, decontamination and the majority of dismantling works were performed by IEA before the year 2002, when the facility was handed over together with spent fuel facilities to the newly created State owned public utility enterprise Radioactive Waste Management Plant (ZUOP). Since the beginning of the 2002 ZUOP has been continuing of EWA decommissioning works and operating 2 separate facilities that used to contain all EWA reactor spent fuel (AFR, wet type of storage), before their repatriation to Russian Federation GTRI (see more information below) initiative. **Currently no spent fuel is stored at Świerk site, beside that in MARIA reactor technical pool.**

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

Both reactors as well as the spent fuel storages are sited at nuclear research centre in Świerk, where also waste treatment and storage facilities for ILW and LLW are located. High activity spent sealed sources are also temporarily stored at Świerk.

Spent fuel facilities and GTRI

Before the year 2009 spent fuel elements from the MARIA reactor was stored in the MARIA reactor operated by IEA (**AR, wet**) and spent fuel storage facility operated by ZUOP. Spent fuel from EWA reactor (HEU and LEU fuel) was stored in two spent fuel storages operated by ZUOP. Within the framework of GTRI Poland implemented RRRFR Programme (Russian Research Reactor Fuel Return Programme). In the years 2009-2014 seven spent fuel shipments were performed and all HEU EWA SF and most of the MARIA SF (80% and 36% enrichment) was shipped back to Russian Federation. The last shipment is planned for 2016 and after that there will be no HEU spent fuel stored in Poland.

Radioactive waste facilities

Radioactive waste of low and intermediate activity produced in Poland is collected, processed, solidified and prepared for disposal by the State-owned public utility ZUOP.

ZUOP operates the following installations and facilities at Świerk site:

- LILW storage tanks for liquid waste,
- treatment station for LILW liquid and solid waste: evaporator and reverse osmosis unit, chemical treatment station (liquid waste), cementation unit, hydraulic press (12 ton),
- temporary storage facility.

At Różan site, ZUOP operates a surface type repository, which was originally a military fort, converted to a repository in 1961. This repository serves for the disposal of low- and intermediate level waste containing short-lived beta and gamma isotopes, SSRS, as well as a temporary storage for long-lived waste. In the first decade of the repository operation, the concrete facilities No. 2, 3 and partially No.1 were filled with not segregated, only partially conditioned waste. Since 1968, short-lived low- and medium level waste is being disposed of in a part of the dry moat area (facility no. 8) and alpha-bearing waste is being placed in temporary storage in facility no. 1 with the intention of retrieval. In the frame of the PHARE Project performed in the years 2003 and 2004, the safety reports related to respectively the operation, closure and post-closure phase of the Różan facility were also prepared. This project also considered the decommissioning options regarding facilities nos. 2 and 3 at the site, including waste retrieval, repackaging and re-disposal.

Różan repository is currently the only radioactive disposal site available in Poland. According to present expectations, this repository is foreseen to be completely filled by 2025. It is likely that another site for a national repository for future waste arising will have to be found. Recently, the National Plan for the Management of Spent Fuel and Radioactive Waste fulfilled the obligation imposed by the Council Directive 2011/70/EURATOM. The National Plan was prepared by the Ministry of Economy (now Ministry of Energy) and approved in 2015 by the Council of Ministers. It establishes actions in the scope of responsible and safe

management of radioactive waste and spent fuel and ensures effective and safe management of radioactive waste and spent nuclear fuel in Poland. The document covers such issues as:

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

-continuation of research and development on deep geological repository undertaken in the late 90s of last century,

-continuation of works connected with closure of Różan repository,

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

Concerning the siting activities for the near-surface repository for low- and intermediate-level waste recently the Ministry of Energy in cooperation with National Environmental Found has prepared a special project covering such issues as gathering, analysis, verification and evaluation of available archival materials collected as a result of a three-year Strategic Governmental Programme undertaken in 1999, as well as conducting additional research being necessary to enable the selection of optimal location of LLW/ILW-SL radioactive waste repository. With respect to the closure of Różan repository new safety report related to closure and post-closure phase will be prepared

Uranium mining

Most mining activities took place in the south-west of the country. Mining of ore ended in 1968, and processing was terminated in 1973. There are some 100 dumps, mostly abandoned, of waste rock and ore totalling approximately 1.4 x 10^6 m^3 as well as one tailing pond, which remediation project (partly funded by the EC) was finished in 2004.

Annex no. 2 – Implementation of Nuclear Power Programme

Prepared by Ministry of Energy

INFORMATION

on the implementation of the nuclear power in Poland

1. Current status of the Polish Nuclear Power Programme

On 28 January 2014 Polish Nuclear Power Programme (PNPP) has been adopted by the Council of Ministers. PNPP is a strategic document which presents the roles and responsibilities of the institutions responsible for the implementation of the programme, as well as issues related to nuclear safety and radiological protection. It includes a detailed scope of activities to be taken for the safe use of nuclear power in Poland and sets a timetable for the construction of two nuclear power plants and the preparation of regulatory and organizational infrastructure for these investments. The Programme envisages the construction of two nuclear power plants with combined capacity of 6 000 MWe (net), producing 50 ca. TWh of electricity per year, which will translate into annual savings of the range of at least 36 million tons of CO2 i.e. approx. 24% of the current CO2 annual emission level in the Polish electricity generation sector.

Schedule of the Programme (as from 2014) consists of the following stages:

- Stage I: selection of the location and signature of a contract with Vendor of the technology chosen for the first NPP (01.01.2014 - 31.12.2016)
- Stage II: technical project and obtaining required by law decisions and opinions (01.01.2017 - 31.12.2018)
- Stage III: building permit and construction of the first unit of the first nuclear power plant, the start of construction consecutive units/nuclear power plants, commissioning of the first unit (01.01.2019-31.12.2024)
- Stage IV: continuation and start building the next unit/nuclear power plants. Completion of the first nuclear power plant (completion of construction of a second nuclear power plant is planned for 2035) (01.01.2025-31.12.2030).

This schedule is currently under review and will be revised and updated after the report on the implementation of the Programme will be presented this year to the Council of Ministers.

Ministry of Energy (until November 2015 – Ministry of Economy) as a sponsor and coordinator of the Programme plays a role of the Nuclear Energy Programme Implementing Organization (NEPIO). Responsibility for the plant's construction rests with PGE EJ1 Sp. z o.o., which is controlled by the PGE Capital Group. It is responsible for direct investment preparations, site characterization work and receipt of all relevant decisions, licences and permits required for NPP construction in Poland. In 2014 PGE, Tauron (power utility), Enea (power utility) and KGHM (copper supplier) signed an agreement to buy shares (10% each) of the PGE EJ1.

In September 2014, PGE EJ1 concluded an agreement with AMEC Nuclear UK Ltd to provide technical advisory services for the investment process aimed at the construction of the first Polish nuclear power plant.

Launching of an tender for technology supplier will be the nearest milestone in the implementation of Programme. The tender qualification phase is expected to be in the first quarter of 2017. In November 2015 PGE EJ1 said that five consortia had expressed interest in bidding: GE Hitachi, Kepco, SNC-Lavalin, Westinghouse and EdF/Areva.

2. Main activities undertaken in implementing the Polish Nuclear Power Programme

2.1 Legislation

Legal framework for the development and functioning of nuclear power has been established, and updated, in line with the relevant international standards, European Union regulations and best practices of leading nuclear countries. A majority of this legislation has been passed and entered into force, already before the PNPP was adopted by the Council of Ministers. The key legislative developments in this area are as follows:

1) *Amendment to the Atomic Law of 29 November 2000, in force as from July 2011* (with the aim *to* provide for establishment of a transparent and stable regulatory framework covering the entire investment process by the National Atomic Energy Agency).

2) *Amendment to the Atomic Law of 29 November 2000, in force as from May 2014* (with the aim to implement the provisions of the Council Directive 2011/70/Euratom on the safe management of spent fuel and radioactive waste).

3) Secondary legislation to the Atomic Law of 29 November 2000, which consists of over forty regulations, mainly resolutions of the Council of Ministers, e.g.:

   - *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 licence for the construction of a nuclear facility and the scope of the preliminary safety report for a nuclear facility.*
   - *Regulation of the Council of Ministers of 10 August 2012 on detailed scope of assessment with regard to land intended for the location of a nuclear facility, cases excluding land to be considered eligible for the location of a nuclear facility and on requirements concerning the location report for a nuclear facility.*
   - *Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design.*
   - *Regulation of the Council of Ministers of 11 February 2013 on requirements for the commissioning and operation of nuclear facilities.*

4) *The Act of 29 June 2011 on Preparing for and Performing Investments Involving Nuclear Power Facilities and Accompanying Investments* (this statute facilitates the process of

constructing the nuclear power plant by significantly reducing the potential investment risks).

2.2 Site selection

In December 2010, Ministry of Economy began the process of public consultation of the PNPP and the strategic environmental impact assessment of the PNPP (Prognosis). Following this consultation, the cross-border consultations of the PNPP and the Prognosis were launched. 10 countries were invited to participate in the consultations: Lithuania, Latvia, Estonia, Sweden, Denmark, Germany, Austria, Czech Republic, Slovakia and Finland. Lithuania, Latvia and Estonia withdrew from participation in the consultation. After participating countries had submitted to Poland its final statement, the official minutes were signed by both parties, what formally ended the consultation process in May 2013.

In 2013 PGE started in cooperation with WorleyParsons site characterization works in the following sites, all located on the Baltic coast: "Choczewo", "Lubiatowo-Kopalino" and "Żarnowiec" after the contract with WorleyParsons was concluded. The contract pertained to the performance of site characterisation works and licensing support required to launch the first Polish NPP project. In December 2014, PGE EJ 1gave notice of the termination of the contract with WorleyParsons. Since then site characterisation is continued relying on the resources of PGE EJ1 and an experienced industry consultant. The scope of this research includes:

- geological, hydrological, seismic research,
- environmental research,
- current land use, availability of infrastructure (including network).

In August 2015 PGE EJ 1, has submitted an application to the General Director for Environmental Protection for issuing a Decision on Environmental Conditions and an application for specifying the scope of the Environmental Impact Assessment Report. These documents constitute a basis for initiating the environmental impact assessment procedure which is prerequisite in the process of the selection of a site for the NPP.

In January 2016 two sites were selected for the full program of site characterization and the environmental impact assessment - "Lubiatowo-Kopalino" and “Żarnowiec”.

2.3 Human resources development

The objective of PNPP with regards to human resources development is to achieve the quantity and quality of the staff which will ensure efficient and safe construction and operation and, at a later stage, decommissioning, of NPPs.

The key role in this field is being played by the Ministry of Energy, which is responsible for initiating, planning, coordination, implementation and monitoring efforts for the development of human resources of nuclear power in Poland. Main activities performed by the Ministry of Energy in this area include:

1) Preparation of documents, papers and materials, e.g.

- Human Resources Development Plan for Nuclear Power
- Report: *Identification of resources and staffing needs for developing nuclear power*
- Report: *Resources and staffing needs of higher education in connection with the PNPP*
- Educational materials on nuclear power

2) Launching a thematic tabs on the website: *Training of staff.*

3) The implementation of the internship program for 36 young Polish scientists, in 2009-2012, within the framework of international cooperation, the Ministry of the French Atomic Energy Commission (CEA).

4) Organization of seminars, conferences, trainings and meetings:

- National conference - The Educational Forum of Nuclear Energy
- Consultation meetings in the area of human resource development with stakeholders of PNPP
- Annual co-organization of the International School of Nuclear Energy
- Dissemination of knowledge of nuclear energy among students - scientific picnics, festivals science, "Atomic bus", etc.

The most crucial activity listed above is the preparation of Human Resources Development Plan for Nuclear Power, with the aim to assess staffing needs for Polish nuclear power sector. The *Plan* will specify and detail the tasks to be delivered and the measures enabling to develop the staff training infrastructure for nuclear power in Poland.The document is expected to be finalized in the first quarter of 2017.

Regarding activities of investor, PGE EJ1 is continuously running a cooperation programme for universities, entitled „Atom for science”. The main aim of this programme is to interest students and academics in nuclear power, to promote young scientists and build a broad expert pool - for the needs of the investor, regulator, public administration and business related to the power plant - affecting the development of nuclear power in Poland.

Apart from Ministry of Energy and the investor, the institutions directly involved in the process of preparation and implementation of PNPP, as far as human resources development for new nuclear power plants in Poland is concerned, include the following entities: Ministry of Science and Higher Education, Ministry of National Education, Ministry of Labour and Social Policy, National Atomic Energy Agency, Radioactive Waste Disposal Enterprise, Office for Technical Inspection and other inspection/control bodies or authorities.

Besides, it must be noted that several Polish technological schools and universities have opened programmes or majors (undergraduate and graduate) directly connected with nuclear power.

2.4 Informative and social activities connected with the introduction of nuclear energy in Poland

As the public support is one of the major challenges for implementation of any new nuclear programme throughout the world, efforts to build the public awareness have been taken by various stakeholders of the Polish nuclear power programe. There are two main organizations responsible for public communication of the PNPP. The Ministry of Energy and PGE EJ 1 are simultaneously campaigning on the subject, which includes initiation of and participation in numerous activities both on the national and local level. The most significant among such activities is the informative campaign “Learn more about atom. Let’s talk about Poland with energy” aimed at supplying Poles with current and thorough information about nuclear energy which was launched in March 2012. Other activities includes web page, social media, contests, participation in public and expert debates, publication and distribution of printed and electronic information materials etc.

Important role in this context is being played by Local Information Centres which have been established by PGE EJ1 in April 2013 in the three municipalities related to the considered sites for the first Polish nuclear power plant - in Choczewo, Krokowa and Gniewino. At the Information Centers the residents and visitors can find information related to the project and to nuclear power on a daily basis. The Centres are equipped with multimedia to offer accessible information and understanding of nuclear power.

The research and scientific institutes (eg. National Center for Nuclear Research (NCNR), Nuclear Chemistry and Technology Institute) are also very active, informing on the wide scope of the nuclear energy applications including electricity generation.

The Ministry of Energy, PGE EJ 1 and the National Centre for Nuclear Research are also taking efforts on building basis for the education on nuclear energy. Direct cooperation with schools and teachers facilitates disseminating knowledge and will benefit in the future, since the PNPP is a long term effort.

Public opinion polls indicate stabile support for implementation of the nuclear energy in Poland. The research commissioned by the Ministry of Energy in November 2015 shows that on the national level 51% of Poles “rather support” or “strongly support” it, while opposite opinions are declared by 44%. Above that, reports commissioned by PGE EJ1 indicate that in three potential sites of the planned first nuclear power station, local support is strong and stable, varying from 66% up to 72%.

2.5 Radioactive waste management

On 16th October 2015 the Council of Ministers adopted a *National Plan for Radioactive Waste and Spent Fuel Management*. The existing national low and medium level radioactive waste repository is expected to be full in 2025, and thus Poland has to find a new site for the new repository. The process of site selection is ongoing and should be completed in 2017. In 2018-2020, the design and all permits should be obtained, allowing the repository to begin operation by 2024.

2.6 International cooperation

In order to ensure that implementation of Polish Nuclear Power Programme satisfy all relevant international standards, Poland is closely cooperating with the International Atomic Energy Agency since the very beginning of the Programme.

In March 2013 Poland hosted International Nuclear Infrastructure Review mission organized by the International Atomic Energy Agency. The mission reviewed the 19 infrastructure issues described in the IAEA publication *Milestones in the Development of a National Infrastructure for Nuclear Power*. The INIR mission team concluded that Poland has completed most of the Phase 1 actions and is progressing with several Phase 2 activities. The mission report identified good practices in the area of stakeholder engagement and transboundary consultation, and recommended that Poland to take further action to strengthen the regulatory framework and Government involvement in the programme, as well as to develop an integrated human resource development plan. In order to implement all the recommendations and suggestions of the mission National Action Plan was adopted by the Ministry of Economy in 2014. The post-INIR mission to assess the implementation of the aforementioned recommendations and suggestions took place in June 2016. Please refer to Introduction for more information about the mission outcome.

Irrespective of its cooperation with the IAEA, Poland remains an active participant of international forums and organizations related to nuclear energy. In 2010 Poland became a member of Nuclear Energy Agency and four years later in November 2014 accessed Agency's Data Bank to maximize benefits resulting from the participation in this organisation. Besides Poland is actively involved in the works of The International Framework for Nuclear Energy Cooperation (IFNEC).

Annex no. 3 – Atomic Law

Summary of the Act of Atomic Law

The Atomic Law Act, originally enacted by the Parliament of the Republic of Poland on 29 November 2000, has been amended several times in the years 2001-2015. Last significant amendment namely the act of 4 April 2014 amending the Atomic Law and certain other acts (Journal of Laws, item 587) entered into force on 24 May 2014. A draft of the said act had been prepared by the Ministry of Economy with the assistance of the PAA President. The act was aimed at complementing the national legal framework with 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 (OJ L 199 of 2.8.2011, p. 48).

The Act is divided into 20 Chapters:

Chapter 1 entitled *"General provisions"* defines the subject and presents definitions of terms used in the text of the Law. The list of definitions of terms has been extended by those connected with safety of nuclear facilities, also some old definition has been improved for example terms "nuclear safety", "nuclear installation". Last amendment of the Atomic Law has changed definitions of such notions as radioactive waste, radioactive waste management, spent nuclear fuel management, storage of radioactive waste or spent nuclear fuel, processing of radioactive waste, disposal of radioactive waste and closure of radioactive waste repositories, the foregoing being caused by a necessity to ensure that the said definitions match those provided in Council Directive 2011/70/Euratom. The definition of the decommissioning of a radioactive waste repository or a spent nuclear fuel repository has been removed from the Atomic Law, for it stems from the very definition of radioactive waste that, since radioactive waste is disposed at a radioactive waste repository without an intention of its subsequent extraction, the repository decommissioning process should not be taken into account at all.

Chapter 2 entitled *"Licences addressing nuclear safety and radiological protection issues"* lists the activities which require licences or notifications from the point of view of nuclear or radiological safety, and activities which are prohibited. It also sets up adequate procedures regarding the licensing and defines the authorities granting licences to perform activities. **Chapter 3** entitled *"Nuclear safety, radiological protection and health protection of workers"* places the responsibility for nuclear safety and radiological protection on manager of the organization pursuing the activities involving exposure and defines the scope of this responsibility, in particular in a case of ceasing activity. It formulates the requirement for justification of such activities, as well as a number of other requirements, such as supervision and inspection, the imperative to follow the "optimization principle" with regard to exposures, adequate training of workers, authorization of persons working on certain positions and performing certain activities important from the nuclear safety and radiological protection point of view, radiological safety of individuals in cases of medical exposures, occupational exposures and radiological protection of workers and external workers, and their rights. This chapter also specifies the conditions for carrying out actions aimed at elimination of radiation emergency consequences, maintaining of the central register of doses received by individuals, categorization of radiation workers (categories A and B) and requirements with

regard to dosimetric equipment. Finally, it introduces a system of subsidizing certain activities in the area of nuclear and radiological safety from the State budget;

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

Chapter 4 entitled *"Nuclear facilities"* places the responsibility for assuring nuclear safety, radiological protection, physical protection and nuclear material safeguards on manager of the organization which holds the licence for construction, commissioning, operation or decommissioning of a nuclear facility. For the process of construction of a nuclear facility, the scope of these requirements is extended to other participants in the investment process, the obligations of the manager of the organisation or unit notwithstanding. This chapter also addresses the fundamental conditions that must be met by a nuclear facility design, the questions of licensing and regulatory review in the stages of construction, operation and decommissioning of nuclear facilities and establishing of the restricted areas around such facility, the information duties of the manager of a nuclear facility and the PAA President concerning nuclear safety and radiological protection issues, as well as formulates the right for the PAA President to curtail or suspend the operation of nuclear facility when nuclear safety may be endangered. The nuclear facility (at stage of construction, commissioning, operation and decommissioning) is required to adopt the integrated management system that, among the others, must include a quality assurance programme One of the important licence prerequisites for the applicant is to possess appropriate financial means required to ensure:

1) fulfilment of the requirements of nuclear safety, radiological protection, physical protection and nuclear material safeguards during the respective stages of operation of a nuclear installation until decommissioning is completed; specifically, the operator of a nuclear power plant has to establish a special fund to cover the costs of the final management of radioactive waste and of the decommissioning costs;

2) for the licence for construction – completion of the construction of a nuclear installation.

Chapter 4a entitled "Public communication pertinent to nuclear power facilities" contains provisions to establish Local Information Centres, Local Information Committees and Municipal Information Points, which are meant, among others, to provide information on a nuclear power facility and to monitor the activities of the operator.

Chapter 5 entitled “Nuclear materials and technologies” formulates requirements for adequate nuclear materials accountancy and their physical protection as well as for appropriate control of nuclear technologies (as required by appropriate international agreements and conventions). In particular it includes prohibition of use these materials and technologies to construct nuclear weapon or nuclear explosives; any scientific researches in this area are subject to notification to the PAA President prior their commencement. It defines also other PAA President’s duties and responsibilities in this area as well as the obligations of the managers of units performing activities with nuclear materials and of other users of lend or buildings where such an activities could be possible, in connection with inspections performed by PAA, IAEA or EURATOM inspectors;

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

Chapter 7 entitled “Radioactive waste and spent nuclear fuel” classifies radioactive wastes, states the responsibilities of the manager of the organizational unit which is handling wastes, and addresses the questions of wastes disposal, including provisions on siting of waste repositories, and of the necessary protection of humans and of the environment. The amended Atomic Law introduced provisions that the organisational unit which has generated the radioactive waste or the spent nuclear fuel is held responsible for ensuring that it is possible to manage the radioactive waste and the spent nuclear fuel from the moment of their generation until their disposal at the repository, including for financing of this procedure and coverage of the related disposal costs, altered the principles of classification, storage, disposal and keeping records of radioactive waste and spent nuclear fuel. With regard to the classification of radioactive waste, the notion of activity level or dose rate on the surface of waste material has been replaced by a criterion of radioactive concentration of radioisotopes the former contain. Last amendment introduced also an obligation regarding the development of a national programme for spent nuclear fuel and radioactive waste management in Poland.

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

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

Chapter 9 entitled “Control and inspection from the viewpoint of nuclear safety and radiological protection conditions” allocates the control and inspection responsibilities to appropriate authorities, formulates these responsibilities as well as the rights of the regulatory authorities, introduces enforcement measures, and sets up qualification requirements with regard to nuclear regulatory inspectors;

Chapter 10 entitled “National radiation situation assessment” obliges the PAA President to conduct systematic assessments of the national radiation situation and formulates requirements thereof, including the use for these purposes of a dedicated Radiation

Emergency Centre established within the PAA and receiving appropriate data from “stations” and “units” serving for early detection of radioactive contamination (the list of such “stations” and “units” has been established by means of the Governmental regulation) and operates the International Contact Point for early warning and information exchange with IAEA, EU and other Countries in a case of radiation emergency. It also obliges the PAA President to provide information to the general public, regional governors, Council of Ministers and/or to the chairman of the appropriate crisis management team at the national level.

Chapter 11 entitled “Radiation emergency management” introduces distinction between different types of radiation emergencies and list the actions to be undertaken in case of such emergencies, as well as formulates the responsibilities on all levels. It refers to the national emergency preparedness plan established through a Governmental regulation and sets up rules for the implementation of specific intervention measures (including the issue of costs to be borne in such cases). It also formulates a requirement to conduct periodic exercises to test the national emergency preparedness plan and addresses the questions of protection against the use of food and feeding stuffs which exceed the permitted levels of radioactive substances contents, both produced within the Polish territory or imported;

Chapter 12 entitled “Civil liability for nuclear damage” allocates the responsibility for nuclear damage caused to individuals, property and environment to the operator and limits its liability to 300 million SDR, allows the operator to establish a limited liability fund in case when claims exceed this figure, obliges the operator to be insured (also in case of the transport of nuclear material from a nuclear installation), sets minimal guaranteed amount of insurance and procedures for claiming the compensation, sets time limits for suing for the damage, and locates the competence in the issues of nuclear damage.

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

Chapter 13 entitled “The President of the National Atomic Energy Agency” states that the President of the PAA is the central organ of the governmental organization and is nominated by the Prime Minister to whom he reports directly, on request by the Minister competent for environmental matters, who supervises PAA administratively. The President executes his tasks (which are listed in Art. 110 of the Atomic Law) through the National Atomic Energy Agency, statute of which is to be issued by the Minister for environmental matters. In addition, this chapter introduces a PAA President’s consulting and opinion-giving body, “Council for Nuclear Safety and Radiological Protection”, which is appointed by the PAA President (although the next amendment of Atomic Law Act will give the authority to appoint members of the Council to the Minister of Environment).

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

Chapter 15 entitled “Penal regulations” introduces financial penalty or other means of punishment for cases of violations of rules established by this Law.

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

Annex no. 4 – List of regulations

Executive Regulations to the Act of Atomic Law

1. Regulation of the Council of Ministers of 11 February 2013 on requirements concerning commissioning and operation of nuclear facilities (JL of 2013, item 281)

2. Regulation of the Council of Ministers of 11 February 2013 on nuclear safety and radiological protection requirements for the decommissioning phase of nuclear facilities and on the content of a nuclear facility decommissioning report (JL of 2013, item 270)

3. Regulation of the Minister of Health of 21 December 2012 on granting authorizations for radiological protection inspectors in laboratories using X-ray devices for medical purposes (JL of 2012, item 1534)

4. Regulation of the Council of Ministers of 10 October 2012 on the amounts of contributions to cover the costs of spent nuclear fuel and radioactive waste disposal and the costs of nuclear power plant decommissioning by organizational entity authorized to operate a nuclear power plant (JL of 2012, item 1213)

5. Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design (JL of 2012, item 1048)

6. Regulation of the Council of Ministers of 31 August 2012 on the scope and method for the performance of safety analyses performed before applying for a nuclear facility construction licence and on the scope of the preliminary safety report for a nuclear facility (JL of 2012, item 1043)

7. Regulation of the Council of Ministers of 10 August 2012 on detailed scope of assessment with regard to land intended for the location of a nuclear facility, requirements concerning siting report for a nuclear facility (JL of 2012, item 1025)

8. 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 (JL of 2012, item 1024)

9. Regulation of the Council of Ministers of 10 August 2012 on the positions important for ensuring nuclear safety and radiological protection and on radiological protection inspectors (JL of 2012, item 1022)

10. Regulation of the Council of Ministers of 24 August 2012 on nuclear regulatory inspectors (JL of 2012, item 1014 as amended)

11. Regulation of the Minister of Economy of 23 July 2012 on detailed rules and conditions for the establishment and operation of Local Information Committees and on the cooperation in the field of nuclear power facilities (JL of 2012, item 861)

12. Regulation of the Council of Ministers of 27 December 2011 on periodical safety review of a nuclear facility (JL of 2012, item 556)

13. Regulation of the Council of Ministers of 26 March 2012 on the special purpose subsidy awarded to ensure national nuclear safety and radiological protection while using ionizing radiation (JL of 2012, item 394)

14. Regulation of the Council of Ministers of 27 December 2011 on the standard quarterly report on the amount of decommissioning fund payment (JL of 2012, item 43)

15. Regulation of the Minister of Environment of 18 November 2011 on the Council for Nuclear Safety and Radiological Protection (JL no. 279, item 1643)

16. Regulation of the Minister of Environment of 9 November 2011 on the standard official identity document of nuclear regulatory inspector (JL no. 257, item 1544)

17. Regulation of the Minister of Health of 29 September 2011 on psychiatric and psychological tests of employees performing activities important for nuclear safety and radiological protection (JL no. 220, item 1310)

18. Regulation of the Minister of Finance of 14 September 2011 on value of the minimum guaranteed amount of the third-party liability insurance for the operators of nuclear devices (JL no. 206, item 1217)

19. Regulation of the Minister of Interior and Administration of 13 April 2011 on the list of border crossings 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 (JL no. 89, item 513)

20. Regulation of the Minister of Health of 18 February 2011 on conditions for the safe use of ionizing radiation for all types of medical exposure (JL no. 51, item 265, as amended)

21. Regulation of the Prime Minister of 8 January 2010 on the procedures for the supervision and inspection by nuclear regulatory authorities in the Internal Security Agency, the Intelligence Agency and the Central Anticorruption Bureau (JL no. 8, Item 55)

22. Regulation of the Council of Ministers of 21 October 2008 on the authorization and approval for import into the territory of the Republic of Poland, export from the territory of the Republic of Poland and transit through this territory radioactive waste and spent nuclear fuel (JL no. 219, item 1402)

23. Regulation of the Council of Ministers of 4 November 2008 on physical protection of nuclear material and nuclear facilities (JL no. 207, item 1295)

24. Regulation of the Minister of Health of 27 March 2008 on minimum requirements for health units providing health care benefits from the X-ray, interventional radiology and radionuclide diagnosis and therapy of non-malignant diseases (JL no. 59, item 365 as amended)

25. Regulation of the Minister of Health of 27 March 2008 on the database of radiological devices (JL no. 59, item 366)

26. Regulation of the Council of Ministers of 4 October 2007 on the allocated and special purpose subsidy, fees and finance management in the state-owned public utility ‘Radioactive Waste Management Plant' (JL no. 185, item 1311, as amended)

27. Regulation of the Council of Ministers of 20 February 2007 on the requirements for controlled and supervised areas (JL no. 131, item 910)

28. Regulation of the Council of Ministers of 20 February 2007 on the terms for import into the territory of the Republic of Poland, export from the territory of the Republic of Poland and transit through this territory of nuclear materials, radioactive sources and equipment containing such sources (JL no. 131, item 911)

29. Regulation of the Council of Ministers of 23 March 2007 on the requirements for the individual dose registration (JL no. 131, item 913)

30. Regulation of the Minister of Health of 2 February 2007 on the detailed requirements for the form and content of the reference and working medical radiological procedures (JL no. 24, item 161)

31. Regulation of the Council of Ministers of 2 January 2007 on the requirements concerning the content of natural radioactive isotopes of potassium K-40, radium Ra-226 and thorium Th-228 in raw materials and materials used in buildings designed to accommodate people and livestock, as well as in industrial waste used in construction industry, and the procedures for controlling the content of these isotopes (JL no. 4, item 29)

32. Regulation of the Minister of Health of 22 December 2006 on the supervision and control of observance of terms of radiological protection in the organizational units using x-ray devices for medical diagnosis, interventional radiology, surface radiotherapy and radiotherapy of non-malignant diseases (JL 2007 no. 1, item 11)

33. Regulation of the Minister of Health of 21 August 2006 on detailed safety requirements for work involving radiological devices (JL no. 180, item 1325)

34. Regulation of the Council of Ministers of 12 July 2006 on detailed safety requirements for work involving ionising radiation sources (JL no. 140, item 994)

35. Regulation of the Minister of Health of 4 May 2006 on the organization, operation mode and the specific tasks of the National Centre for Radiation Protection in Health Care (JL no. 85, item 592)

36. Regulation of the Minister of Health of 7 April 2006 on minimum requirements for health care facilities applying for authorization to conduct activities involving exposure to ionizing radiation for medical purposes, consisting in the provision of health services in the field of radiation oncology (JL no. 75, item 528 as amended)

37. Regulation of the Council of Ministers of 18 January 2005 on the emergency plans for radiation emergency (OJ No. 20, item 169 as amended),

38. Regulation of the Council of Ministers of 18 January 2005 on ionizing radiation dose limits (JL no. 20, item 168)

39. Regulation of the Council of Ministers of 27 April 2004 on intervention levels for various intervention measures and criteria for cancelling intervention measures (JL no. 98, item 987)

40. Regulation of the Council of Ministers of 27 April 2004 on the determination of entities competent to inspect maximum permitted levels of radioactive contamination of foodstuffs and feeding stuffs following a radiation event (JL no. 98, item 988)

41. Regulation of the Council of Ministers of 27 April 2004 on the protection against ionising radiation of outside workers exposed during their activities in controlled areas (JL no. 102, item 1064)

42. Regulation of the Council of Ministers of 27 April 2004 on prior information to the general public in the event of a radiation emergency (JL no. 102, item 1065)

43. Regulation of the Council of Ministers of 17 December 2002 on the stations for early detection of radioactive contamination and on the units that conduct measurements of radioactive contamination (JL no. 239, item 2030)

44. Regulation of the Council of Ministers of 23 December 2002 on the requirements for dosimetric equipment (JL no. 239, item 2032)

45. Regulation of the Council of Ministers of 14 December 2015 on radioactive waste and spent nuclear fuel (JL item 2267)

46. Regulation of the Council of Ministers of 30 June 2015 on the documents required with the application for the licence for activities involving the exposure to ionizing radiation or with the notification of such activities (JL item 1355)

47. Regulation of the Council of Ministers of 6 August 2002 on the cases when the exposure to ionizing radiation are exempted from mandatory licensing or notification, and on the cases when such activities can be conducted on the basis of a notification (JL no. 137, item 1153 as amended)

48. Regulation of the Council of Ministers of 14 December 2015 on periodical safety review of a nuclear waste repository (JL from 2016, item 28)