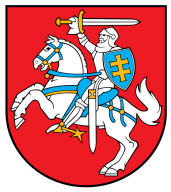

Republic of Lithuania

CONVENTION ON NUCLEAR SAFETY

SIXTH NATIONAL REPORT

Vilnius 2013

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ACRONYMS AND ABBREVIATIONS USED IN THIS REPORT

ABWR	Advanced Boiling Water Reactor
ALARA	As Low As Reasonable Achievable
ALS	Accident Localization System
AMC	Accident Management Centre
ASSET	Assessment of Safety Significant Event Teams
AS&QMD	Audit, Safety and Quality Management Department (INPP)
ATWS	Anticipated Transient Without Scram
BWR	Boiling Water Reactor
CPS	Control and Protection System
DSAR	Decommissioning Safety Analysis Report
DSS	Diverse Shutdown System
ECURIE	European Community Urgent Radiological Information Exchange
EIA	Environmental Impact Assessment
ENSREG	European Nuclear Safety Regulators Group
EML	Environmental Monitoring Laboratory
EPA	Environment Protection Agency
EPO	Emergency Preparedness Organization
EPP	Emergency Preparedness Plan
ERC	Emergency Response Centre
ESI	Emergency Support Instruction
EU	European Union
EURATOM	European Atomic Energy Community
FA	Fuel Assemblies
FC	Fuel Channel
FDP	Final Decommissioning Plan
FINAS	Fuel Incident Notification and Analysis System
FRD	Fire and Rescue Department
IAEA	International Atomic Energy Agency
IMS	Integrated Management System
INES	International Nuclear Event Scale
INPP	Ignalina Nuclear Power Plant
IRS	International Reporting System for Operating Experience
ISFSF	Interim Spent Fuel Storage Facility
ISI	In-Service Inspection
I&C	Instrumentation and Control
LBB	Leak Before Break
LTL	Lithuanian Litas
MCC	Main Circulation Circuit
MCP	Main Circulating Pump
MCR	Main Control Room
NI	Nuclear Installation
NIKIET	Research and Development Institute of Power Engineering
OEF	Operational Experience Feedback
OIL	Operating Intervention Level
OSART	Operational Safety Review Team

PSA	Probabilistic Safety Assessment
PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
QM	Quality Management
RATA	Lithuanian State Company “Radioactive Waste Management
RAMP	Review of Accident Management Programs
RBMK	Channel-type Large Power Reactor
RCR	Reserved Control Room
RPC	Radiation Protection Centre
RSR	Review of Safety Report
RUZA	Guidelines on the management of the beyond design accidents
SAR	Safety Analysis Report
SFA	Spent Fuel Assemblies
SF	Spent Fuel
SFSP	Spent Fuel Storage Pool
SIP	Safety Improvement Program
SOAI	Symptom Based Oriented Accident Instructions
SPH	Storage Pool Hall
SPI	Safety Performance Indicators
SSC	Structures, Systems and Components
SSRM	Site Safety Review Mission
TG	Turbine generator
TLD	Thermo-luminescent Dosimetry
TS	Training Subdivision
TSC	Technical Support Centre
TSO	Technical Support Organisation
USIE	Unified System for Information Exchange in Incidents and
VAE	Joint stock company “Visagino atominė elektrinė”
VATESI	Lithuanian State Nuclear Power Safety Inspectorate
VNIPIET	All-Union Research and Development Institute for Energy
VNPP	Visaginas Nuclear Power Plant
WANO	World Association of Nuclear Operators
WENRA	Western European Nuclear Regulators’ Association

INTRODUCTION

This report provides updated information as compared to the Lithuanian National Report issued in 2010 and National Report for Second CNS Extraordinary Meeting issued in 2012.

The present Report is intended to provide the general information about the current state of nuclear safety in Lithuania and measures taken to improve the nuclear safety in the light of Fukushima accident.

During reported period decommissioning activities of both Ignalina Nuclear Power Plant (INPP) units continued. Unit 1 was shut down on 31 December 2004 and Unit 2 was shut down on 31 of December 2009. Defueling of Unit 1 reactor was completed in December 2009, partial defueling of Unit 2 reactor was performed during 2010-2012. Both units are maintained in post-operation state, based on VATESI license and in accordance with the requirements of Technical specification. In 2012 Lithuania was participating in European "stress test" activities as far as spent nuclear fuel still remains in the reactor core of Unit 2 and in spent fuel pools of both Units. The INPP prepared the plan of measures to be implemented for safety improvement taking into account lessons learned from Fukushima Daiichi accident which was approved by the VATESI. The VATESI has developed and approved in 2013 the plan for upgrading of nuclear safety in Lithuania (National Action Plan of Lithuania) associated with post-Fukushima lessons learned and stress test peer review recommendations and suggestions.

Due to the planned development of nuclear energy and decommissioning of the INPP in Lithuania a legal and regulatory reform was performed in order to strengthen the regulatory body and to improve efficiency, transparency and streamline the regulatory process. The package of amendments to nuclear field related laws (such as Law on Nuclear Energy, Law on Radiation Protection, Law on Radioactive Waste Management and complementary legal acts) and a new Law on Nuclear Safety were adopted by the Parliament and came into force from on the 1st of October, 2011.

In 2009, the Ministry of Energy started tendering process which continues with selection of Hitachi as the Strategic Investor and the ABWR as desired technology for the new NPP in Visaginas site. In 2012, the VAE was appointed by the Lithuanian Government as a national investor of the VNPP, which together with other project participants will hold shares in the Project Company. National investor will have no less than 34% of the new NPP's shares. Sites for the construction of VNPP are selected in accordance with the IAEA recommendations and national requirements of nuclear safety. During the VNPP site evaluation process all available geological, geophysical, seismological, meteorological, hydrological and other data collected by expert teams for the region extending more than 300 km from the sites. New site vicinity and site scale electrical resistivity tomography, seismic and engineering geological surveys were conducted in 2009-2010. The gathered available data and newly acquired results were collected and analysed by Lithuanian and foreign experts in Site Evaluation Report. All documents following the IAEA requirements were independently reviewed and improved when necessary after the review.

Information presented in this report demonstrates how Republic of Lithuania is fulfilling its obligation under the Convention on Nuclear Safety.

ARTICLE 6 EXISTING NUCLEAR INSTALLATIONS

Each Contracting Party shall undertake 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.

6.1. List of existing Nuclear Installations as defined in Article 2 of the Convention

The Ignalina nuclear power plant (INPP) is the only nuclear installation in Lithuania. It contains two RBMK-1500 type reactors, which have their own design peculiarities as compared with the eleven RBMK-1000 type reactors currently in operation in the Russian Federation. The INPP is located in the north-eastern part of Lithuania, near the borders with the Republic of Latvia and the Republic of Belarus. The power plant was built as part of the Soviet Union's North-West Unified Power System. The INPP Unit 1 was connected to the power grid at the end of 1983, and Unit 2 - in August 1987. The design lifetime of the Units was projected to last till 2014 and 2017 respectively. The INPP Unit 1 was finally shut down on 31 December 2004 and Unit 2 was finally shut down on 31 December 2009 in compliance with the protocol of Lithuania's EU accession.

The development of the INPP design was implemented by the All-Russia Science Research and Design Institute of Power Engineering Technology (Russian abbreviation – VNIPIET), former Soviet Union, which was the principal designer. The INPP contains RBMK-1500 type reactors, designed and constructed by the former Ministry of Mid-Scale Industry of the Soviet Union. The turbine hall and the open switch-yard were designed by the Kiev branch of the Atomic Energy Design Institute (Russian abbreviation –"Atomenergoproekt"), Kiev, former Soviet Union. The scientific supervisor of the RBMK-1500 project was the Kurchatov Atomic Energy Institute (often referred to as the Russian Research Centre "Kurchatov Institute"), Moscow, former Soviet Union. The principal designer of the nuclear steam supply system was the Research and Development Institute of Power Engineering (Russian abbreviation –NIKIET), former Soviet Union.

Both INPP reactors have one circuit, two cooling loops; fuel assemblies are loaded into individual channels. The neutron spectrum is thermalized by a massive graphite moderator block. The plant uses slightly enriched nuclear fuel with or without burnable poison. Refuelling is performed during the reactor operation.

The INPP belongs to the category of "boiling water" channel-type reactors. The reactor cooling water, as it passes through the core, is subjected to boiling and is partially evaporated. The steam-water mixture then continues to the drum-separators, the elevation of which is greater than that of the reactor. Here the water settles, while the steam proceeds to the turbines. The remaining steam beyond the turbines is condensed in the condenser, and the condensate is returned via the deaerator by the feed water pumps to the water of the same drum-separators. The coolant is returned by main circulation pumps to the core, where part of it is again converted to steam.

This fundamental heat cycle is identical to the BWR cycle widely used throughout the world and is similar to the thermal cycle of the power plant using the carbon-hydrogen fuel. However, compared to BWRs used in Western power plants, the INPP and other plants with the RBMK-type reactors have a number of unique features. The most important plant parameters are listed in Table 6.1.

Table 6.1 The most important parameters of the INPP

Parameter	**Value**
Coolant	water (steam-water mixture)
Heat cycle configuration	single circuit
Power, MW:	
Thermal (design)	4800
Electrical (design)	1500
Core dimensions, m:	
height	7
diameter	12
Thickness of reactor's graphite reflector, m:	
end	0.5
side	0.88
Lattice pitch, m	0.25 x 0.25
Number of channels:	
fuel	1661
control and protection system	235
reflector-cooling	156
Fuel	uranium dioxide, uranium dioxide with erbium oxide
Initial fuel enrichment for ^{235}U, %	2.0
Enrichment for ^{235}U, % with 0.41% of erbium used since 1995	2.4
Fuel enrichment for ^{235}U, % with 0.5% of erbium, used since 2001	2.6
Fuel enrichment for ^{235}U, % with 0.6% of erbium, used since 2005	2.8
Nuclear fuel burn up, MW·day/kg	22.5
Uranium-erbium fuel with 0.41% of erbium addition burn-up, MW·day/kg	25.2
Nuclear fuel with 0.5% of erbium addition burn up, MW·day/kg	25.2
Nuclear fuel with 0.6% of erbium addition burn up, MW·day/kg	27.0
Temperatures, ^{o}C:	
maximum temperature in centre of the fuel pellet	2100
maximum graphite stack temperature	760
maximum fuel channel temperature	360
coolant temperature at the fuel channel inlet	260 – 266
coolant temperature at the fuel channel outlet	284
feed-water temperature	177 – 190
Excessive pressure, MPa:	
steam pressure at separators	6.38 – 6.87
pressure in MCP pressure header	8.6
Coolant flow rate through the reactor, kg/s	11111 – 13333
Steam produced in the reactor, kg/s	2361 – 2444
Void fraction at the reactor outlet, %	23 – 29
Maximum fuel channel parameters:	
fuel channel power, kW	4250
coolant flow rate through the fuel channel, kg/s	8.7
void fraction at the fuel channel outlet, %	36.1
Number of main circulation pumps	8
Capacity of main circulation pumps, kg/s	1944 – 3056

6.2. Overview of significant safety related issues, including events that occurred in the nuclear installations over the last three years, and measures taken in response to these issues

Defueling of Unit 1 reactor started in 2006 and was completed in December 2009. Currently Unit 1 is maintained in the post-operation state, based on VATESI operation license and in accordance with the requirements of the Technical Specification.

Unit 2 was shut-down on 31 of December 2009. Defueling of Unit 2 reactor started in 2010 and is continued up to now. Unit 2 is maintained in the post-operation state based on VATESI operation license and in accordance with the requirements of the Technical Specification for operation of Unit2.

Decommissioning of various Unit 1 and Unit 2 facilities is underway. These activities are performed in accordance with the INPP Final Decommissioning Plan and in line with Unit 1 and Unit 2 Decommissioning Projects.

6.3. Overview of planned programmes and measures for the continued safety upgrading, where appropriate, of each type or generation of nuclear installation

The INPP activity for safety improvement is based on priorities to meet the current requirements of national and international safety standards, on results of the analysis, carried out in SAR of Unit 1, SAR of Unit 2 (SAR-2) and RSR scope, it also includes additional calculations, implementation of VATESI requirements, modifications, which improve the system reliability, thus ensuring the INPP safety. Regardless of the fact that Ignalina NPP Unit 1 and Unit 2 are in permanent shut down, INPP further implements the safety improvement measures in accordance with INPP's Safety Improvement program (SIP-3). Each year INPP revises Safety Improvement program (SIP-3) and submits it to VATESI for approval.

Three SIP-3 measures are being implemented on a permanent basis: the measures for reducing the frequency of an individual exposure (the ALARA principle), managing the ageing of the safety-related systems and maintaining the qualified condition of the safety-related structures, systems and components.

Following safety improvement measures including ones linked to the Fukushima Daiichi accident lessons were implemented during 2010 – 2012 years period:

- Feasibility and safety assessment of conversion of the existing Bituminised Radioactive Waste Storage Facility (bld. 158) into a Radioactive waste Repository, development of the Safety Analysis Report and periodic safety assessment of this facility;
- Defining the seismic category of Buildings 159Б, 151, 155, 155/1, 157, 157/1;
- Conservation of the fully loaded compartments of the Solid Radioactive Waste Storage Facility (building 157/1).
- Assessment the possibilities of the emergency removal and repair works by organization of emergency preparedness for beyond design-basis emergency scenarios related to the level of earthquake above maximal calculated earthquake and resulting in the cracks or collapse of the construction structures of the operating spent fuel interim storage facility and new spent fuel interim storage facility, including casks blockage by debris, as well as cracks or collapse of the construction structures of the "hot cell" of the new spent fuel interim storage facility during the works with spent nuclear fuel in the "hot cell";
- Development of the report for justifying the possibility and safe performance of emergency recovery works in case of the beyond design basis earthquake;
- Assessment the robustness and availability of Accident Management Centre of organization of emergency preparedness against an earthquake;
- Assessment of the seismic alarm and monitoring system application for formalization of the emergency preparedness announcement criterion and including this criterion in the operational manual of the seismic warning and monitoring system.
- Organization of data transfer of the seismic alarm and monitoring system to the computer information system of Organization of Emergency Preparedness;

- Perform assessment and develop a report containing analysis of operability of the sensors of temperature measuring, water's level measuring and radiation level measuring in spent fuel pools in case of increased humidity conditions during beyond design basis accidents;
- Providing of the power supply of water temperature and level instruments in the spent fuel storage pools of both Units from diesel generator No. 7 of Unit 2 or from the mobile diesel generator connected to Unit 2.
- Organization of the diesel fuel supply for assuring long-term operation of diesel generators.
- Evaluation of the work capacities of water temperature and level instruments in the spent fuel storage pools as well as radiation detectors in the spent fuel storage pools halls of both Units in conditions of beyond design-basis accident.
- Additional assessment of the spent fuel storage pools safety on purpose to identify possible practical improvement.

Based on the assessment of the results of the implementation of the INPP Safety Improvement Programme, the safety level of INPP during period 2010-2012 was acceptable. Safety Improvement Program (SIP-3) will be continued in 2014 year.

6.4. Identification of installations for which decisions on shutdown have been made

Following the Resolution No. 1491 as of 25 November 2004 and the Resolution No. 1448 as of 4 November 2009 of the Government of the Republic of Lithuania pursuant to the 4th protocol of Treaty between the Kingdom of Belgium, the Kingdom of Denmark, the Federal Republic of Germany, the Hellenic Republic, the Kingdom of Spain, the French Republic, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the Republic of Austria, the Portuguese Republic, the Republic of Finland, the Kingdom of Sweden, the United Kingdom of Great Britain and Northern Ireland (Member States of the European Union) and the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia, the Slovak Republic, concerning the Accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic to the European Union, the INPP Unit 1 was shutdown on 31 December 2004 and Unit 2 was shutdown on 31 December 2009.

On 29 September 2010 the Government of the Republic of Lithuania approved the new INPP Decommissioning Programme for the period from 2010 to 2014 which is a continuation of the previous Programme implemented during the period of 2005 – 2009. The Programme was amended in June 2012.

The Programme establishes the objectives and tasks related to the INPP decommissioning, radioactive waste management, assurance of power supply and INPP region development.

The main objectives of the Programme directly related to the INPP decommissioning are as follows:

- To ensure safe and efficient maintenance and supervision of the finally shutdown INPP;
- To handle existing radioactive waste and radioactive waste to be generated during decommissioning and to ensure their adequate storage and disposal.

Besides the Programme also establishes the following objectives that are not directly related to the INPP decommissioning:

- To implement the energy infrastructure development projects;
- To mitigate the negative social and economical consequences of the INPP decommissioning to the region.

In order to reach the objectives related to the INPP decommissioning and radioactive waste management a number of tasks must be fulfilled. Among others, the main tasks are as follows:

- Adopt and regulate the required legislation related to the INPP decommissioning;
- Ensure works of services performing decommissioning activities and those carrying out surveillance of these activities;
- Evaluate the preparation for decommissioning and decommissioning projects from the point of view of nuclear and radiation safety, as well as issue required licences for their implementation;
- Develop technical documentation of the INPP decommissioning projects and carry out preparatory works;
- Start dismantling of Unit 1 and Unit 2 equipment;
- Monitor, evaluate and predict radiological impact of the INPP decommissioning to the environment and the public;
- Implement the state-of-the-art spent nuclear fuel handling and storage technologies, analyse possibilities of their disposal;
- Develop radioactive waste management infrastructure based on the state-of-the-art technologies.

As an appendix, the Programme contains the Plan of Measures for Implementation of the State Enterprise Ignalina NPP Decommissioning Programme for the period of 2010 – 2014 covering the measures to be implemented in order to reach the above mentioned objectives.

The Final Decommissioning Plan

Pursuant to the provisions of the Law on Nuclear Energy (Off. Journal, 1996, No 119-2771) and General Requirements for Decommissioning of the Ignalina NPP, VD-EN-01-99, (Off. Journal, 1999, No 85 -2558) which were effective at the time of preparation for decommissioning of the INPP, the INPP prepared the Final Decommissioning Plan (FDP) which was finally approved by the Head of VATESI in May 2004 and in July 2005 the FDP was approved by the Ministry of Economy. In compliance with the Requirements for Decommissioning of Nuclear Facilities, P-2009-02, (Off. Journal, 2009, No 43-1708) superseding the above mentioned General Requirements for Decommissioning of the Ignalina NPP, VD-EN-01-99, the FDP shall be reviewed at least once per 5 years considering the experience gained during the implementation of the decommissioning process, changes in the decommissioning strategy, decommissioning performance schedule, financing, etc. Therefore, in 2010 the process for the FDP update was initiated which is still ongoing due to incorporation of comments provided by the interested state institutions participating in the FDP agreement process and the major delays.

Though the final date of termination of the overall decommissioning process has shifted, but the adopted decommissioning strategy remains unchanged and is further implemented as the strategy of immediate dismantling.

The FDP evaluates the main milestones of decommissioning including cost estimation for the post-shutdown period, and the cost of the necessary decommissioning preparatory work and decontamination and dismantling activities. The FDP also determines the configuration of Unit 1 and Unit 2 systems during fuel unloading from the reactor (first phase) and during fuel unloading from the spent fuel storage pools (second phase).

The Plan encompasses the entire period of the INPP decommissioning (starting with the preparatory works for step by step dismantling of separate installations, systems and equipment not needed any more to ensure the safe operation and maintenance of the INPP, actual dismantling and decontamination of those installations, construction of new facilities dedicated for interim storage of spent fuel and radioactive waste, removal of spent fuel from the units to the constructed interim storage facility, demolishing of emptied buildings and to the final recultivation of the site).

In order to implement the adopted strategy decommissioning activities and implementation of

separate projects are carefully planned. FDP describes principles, methods and technologies, as well as the general schedule necessary to ensure safe in respect to nuclear, radiation, physical protection, environment protection and efficient decommissioning process.

The INPP FDP covers the following areas of concern: Applied regulatory framework; Adopted dismantling strategy of the INPP installations; Description of the plant to be decommissioned; Decommissioning plan and schedule; Licensing strategy of the decommissioning process; Dismantling techniques and tools; Decontamination technology; Radiological characterization of the INPP installations, buildings and the territory; The INPP decommissioning project technical concept; INPP waste management strategy; Description of radioactive and hazardous materials already accumulated and to be accumulated during the decommissioning process; Decommissioning safety assessment; Description of the decommissioning environmental impact assessment process; Radiation protection program; INPP organizational chart during the decommissioning stage; Decommissioning expenses and financing; Description of the management system; Demolishing of buildings and recultivation of the site.

The overall INPP decommissioning process is subdivided into several stages in order to facilitate coping with the arising risks and to ensure reliable distribution of funds and consecutive implementation of works. The general planning of the decommissioning activities will be specified during implementation of separate dismantling and decontamination projects when identifying the interrelated activities. In respect to nuclear safety the activities such as handling of spent fuel, modification and isolation of systems, dismantling and decontamination of systems not related with safety are carried out after the final shutdown of the reactors. The preparatory works, actual dismantling and decontamination works are performed by the INPP qualified staff.

6.5. Statement on the position of the Contracting Party concerning the continued operation of the nuclear installations, explaining how safety and other aspects were taken into account in reaching this position

Currently both INPP Units have the status of the finally shutdown units. Based on paragraph 3 of Article 29 of the Law on Nuclear Safety the Licence for operation of the NPP is valid as long as all nuclear fuel is completely removed from it. Two defueling stages are differentiated in the Decommissioning Safety Analysis Report (DSAR):

- Defueling phase 1 – a stage starting after the final reactor shutdown, when the reactor is cooled down, fuel unloading from the reactor and the subsequent storage of spent fuel assemblies (SFA) in the SFSP or their transportation to Unit 2 for complete burn up (in case of Unit 1). The phase ends up when the reactor is completely defueled.
- Defueling phase 2 – a stage starting after the stage 1 and ends up by SFA removal from the SFSP to the ISFSF, i.e. the complete defueling of the Unit.

Both phases are associated with isolation, preparation for dismantling and subsequent dismantling of systems and equipment that are not needed any more to ensure safety and safe operation of the remaining in operation safety systems and equipment.

All requirements pertaining to the power unit in operation are applicable during this period. Isolation and dismantling of separate systems and components are performed in accordance with the Modifications Implementation Procedure in the scope of the changed Licence conditions issued by the regulatory body. Subsequently a common Unit 1 and Unit 2 Decommissioning Licence will be obtained for performance of remaining decommissioning activities at both Units.

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 license;

iii. a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licenses;

iv. the enforcement of applicable regulations and of the terms of licenses, including suspension, modification or revocation.

7.1. Article 7(1) – The legislative and regulatory framework governing the safety of nuclear installations

7.1.1. Overview of the primary legislative framework for nuclear safety, including interfacing national legislation

Due to the planned development of nuclear energy and decommissioning of INPP in Lithuania a legal and regulatory reform was performed in order to strengthen the regulatory body and to improve efficiency, transparency and streamline the regulatory process.

The package of amendments to nuclear field related laws (such as Law on Nuclear Energy, Law on Radiation Protection, Law on Radioactive Waste Management and complementary legal acts) and a new Law on Nuclear Safety were adopted by the Parliament and came into force on the 1st of October ,2011.

The main laws, regulating nuclear energy, are:

- Law on Nuclear Energy;
- Law on Nuclear Safety;
- Law on Radiation Protection;
- Law on Radioactive Waste Management.

The Law on Nuclear Energy was adopted in 1996 and was amended in 2011 (new edition). Law on Nuclear Energy establishes the general legal basis for activities involving nuclear materials, for other areas of nuclear energy involving sources of ionising radiation and for management of nuclear fuel cycle materials, including radioactive waste, managed at a nuclear installation. Regulation and supervision of nuclear safety, radiation protection and safety of radioactive waste management in the area of nuclear energy is performed under this Law, the Law on Nuclear Safety, the Law on Radiation Protection and the Law on Management of Radioactive Waste. The amendments to the Law on Nuclear Energy of 2011 establish the basis for a stronger nuclear regulatory authority with functions clearly separated from the functions of other authorities, institutions or organizations engaged in development of the nuclear energy or use of nuclear energy, including production of electricity. Regulatory body VATESI is now accountable to the President of Republic of Lithuania and the Government of Republic of Lithuania.

The Law on Nuclear Safety, adopted in 2011, among other provisions, establishes a detailed

procedure for issuing licenses, permits and other types of authorization, including the documents required and conditions to be fulfilled in order for an activity to receive authorization. This law also establishes the main principles for safety assessment and provides for different types of enforcement measures, including economic sanctions (penalties) for the most severe cases of noncompliance with safety requirements.

The Law on Nuclear Energy and the Law on Nuclear Safety transpose the Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community framework for safety of nuclear facilities.

Law on Radiation Protection establishes the legal basis for protection of people and the environment from the harmful effects of ionizing radiation. It also establishes a licensing system for the use of radioactive materials and radiation-emitting devices, and prescribes general rules for their use. The Law also provides powers and responsibilities of the authorities in this field. The amendments to the Law on Radiation Protection of 2011 are related to the separation of functions of the Radiation Protection Centre and VATESI in the field of radiation protection. VATESI is now responsible for exercising state regulation of and supervision over the radiation protection of those engaged in the practices in the area of nuclear energy involving sources of ionising radiation.

The Law in Radioactive Waste Management establishes the rights, duties and functions of the state executive and supervisory authorities and of persons and legal entities involved in radioactive waste management. The amendments to the Law on Radioactive Waste Management of 2011 are related to the change of competences in state regulation of radioactive waste management. VATESI is now entitled with the responsibility for the establishment of the clearance levels of radionuclides for the materials and waste generated during the activities involving sources of ionising radiation in the area of nuclear energy (formerly functions of the Ministry of Environment).

Other important laws, considering the primary legislation of nuclear energy development are as follows:

The Law on Environmental Protection in conjunction with the law on Environmental Impact Assessment stipulates that installation of any nuclear facility must be accompanied by an environmental impact assessment. The Law on Environmental Protection regulates all environmental issues, whereas the Law on Nuclear Energy regulates only nuclear facilities safety issues.

The Law on Nuclear Power Plant adopted in 2007, establishes provisions necessary to create legal, financial and organizational preconditions for the implementation of a new nuclear power plant project. According to the Law a project implementing company shall be established and shall be responsible for carrying out the implementation of the project in compliance with the safety requirements imposed on nuclear activities. A new edition of the Law was adopted in 2012. The purpose of the amendments is to establish favourable legal, financial and organisational conditions to implement new nuclear power plant project in Lithuania.

The Law on the Control of Strategic Goods regulates the import, export and transport of strategic goods and technologies that are considered as the activities that could contribute to the proliferation of nuclear weapons, thus ensuring the implementation of international agreements that prohibit such proliferation. The Law establishes lists of goods subject to control. Licenses are necessary for all goods subject to control, and are issued by the Ministry of Economy. The Ministries of the Environment, Defence, Finance and various other state entities whose activities involve goods subject to control, must consult the Ministry of Economy on any decisions concerning such goods.

The Law on Granting the concession and assuming the essential property obligations of the Republic of Lithuania in Visaginas nuclear power plant project No. XI-2085 dated 21 June 2012 approved by the Parliament of the Republic of Lithuania provides consent for granting concession to Visaginas nuclear power plant project development company and the concession agreement project, including the essential property obligations of the Republic of Lithuania in Visaginas nuclear power plant project.

Law Amending the Law on Enterprises and Facilities of Strategic Importance to National Security and Other Enterprises of Importance to Ensuring National Security No. XI-2087 dated 21 June 2012 approved by the Parliament of the Republic of Lithuania sets appropriate legal environment

to implement strategic energy projects in Lithuania with regard to the respective companies important for ensuring national security interests, including Visaginas nuclear power plant project development company.

7.1.2. Ratification of international conventions and legal instruments related to nuclear safety

Lithuania is a party to the main relevant international conventions. There was no new development in the area of ratification of international conventions and legal instruments related to nuclear safety during the reported period (see Annex I).

7.2. Article 7(2)(i) – National safety requirements and regulations

7.2.1. Overview of the secondary legislation for nuclear safety

The most significant Governmental legal documents approved during the reported period:

- The Resolution No. 1406, November 21st, 2012, of the Government of the Republic of Lithuania on the approval of Statute of VATESI and repeal of The Resolution No. 1014, July 1st, 2002, of the Government of the Republic of Lithuania on the approval of Statute of VATESI and the Statute of VATESI Board (Official Gazette, 2012, No. 137-7019). The new edition of the Statute was adopted due to amendments of the Law on Nuclear Energy, the Law on Radiation Protection, the Law on Radioactive Waste Management and new Law on Nuclear Safety, as these laws establish new functions and amend existing functions of VATESI.
- The Resolution No. 722, June 20th, 2012, of the Government of the Republic of Lithuania on the approval of Rules of Procedure for Issuing Licenses and Permits in the Area of Nuclear Energy and the repeal of The Resolution No. 103, January 27th, 1998, of the Government of the Republic of Lithuania on the approval of Regulations of Licensing of Nuclear Power Related Activities and its amendment (Official Gazette, 2012, No. 71-3659). The Rules of Procedure establish the detailed list of documents, which must be provided for VATESI by the applicant with the application for licenses and permits, specified in the Law on Nuclear Safety (licenses for construction, operation, construction and operation of a nuclear installation, for decommissioning of a nuclear installation, for supervision of a closed radioactive waste repository, for shipment of nuclear fuel cycle materials, and nuclear materials and fissile materials indicated in the Annex 1 to Law on Nuclear Safety in established quantities, for acquisition, possession and usage of specified nuclear materials and fissile materials in quantities established in Annex 1 to Law on Nuclear Safety; permits for first delivery of nuclear fuel to the site of a nuclear power plant, a nuclear power plant unit, a research nuclear reactor, for delivery of nuclear and (or) nuclear fuel cycle materials to the site of a nuclear installation, with the exception of a nuclear power plant unit and a research nuclear reactor, and (or) for the first test while using nuclear and (or) nuclear fuel cycle materials in such nuclear installations, for the first start-up of a nuclear power plant unit and a research nuclear reactor, for starting the industrial operation of a nuclear installation, for start-up a nuclear reactor after its shut-down) and list of documents, which must be provided with the application to amend the license or permit conditions. The Rules also establish detailed procedural aspects of the procedure of submission and review of applications.
- The Resolution No. 83, January 25th, 2012, of the Government of the Republic of Lithuania on the approval of Rules of Procedure of the Assessment of the Nuclear Power Plant's Site Evaluation Report (Official Gazette, 2012, No. 15-638). The Rules of Procedure establish the procedure of submission and review of the site evaluation report as well as the procedure of presenting the findings by state agencies, which are required to review and assess the report, and final approval of the report by VATESI. The specific requirements for the nuclear power plant's site evaluation are established by the Nuclear Safety Requirements BSR-2.1.3-2010 "General Requirements for the Site evaluation of a Nuclear Power Plants", approved by the Order of the Head of VATESI No. 22.3-58, 20th of July, 2010.

- The Resolution No. 99 of January 18th, 2012, of the Government of the Republic of Lithuania on the approval of National Plan for Protection of Population in Case of Nuclear Accident (Official Gazette, 2012, No. 15-654). The Plan establishes measures of emergency preparedness in case of nuclear or radiological accident at the state level.
- The Resolution No. 1273 of February 2nd, 2012, of the Government of the Republic of Lithuania on the approval of Rules of Procedure of the Development and Review of the Design Basis Threat and Submission of Information to VATESI (Official Gazette, 2012, No. 17-780). Rules of Procedure establish the procedure of the development and review of the Design Basis Threat, including procedural arrangements of the work of the Design Basis Threat Development Commission and responsibility of State agencies and other legal entities to submit information required to develop and review the Design Basis Threat.
- The Resolution No. 1872, December 3rd, 2002, of the Government of the Republic of Lithuania on the approval of the Rules of Procedure of Submission of Data on Activities Involving Radioactive Waste Disposal to the European Commission (Official Gazette, 2002, No. 116-5198; 2007, No. 55-2141; 2012, No. 39-1931). The revised version of Rules of Procedure was approved by the Resolution No. 1872, 3rd of December, 2002, of the Government of the Republic of Lithuania. The amendments derive from the Commission Recommendation 2010/635/EURATOM of 11 October 2010 on the application of Article 37 of the EURATOM Treaty (replacing Commission Recommendation 1999/829/EURATOM of 6th of December 1999 on the application of Article 37 of the EURATOM Treaty). The Rules of Procedure establish requirements for preparation of General Data document, including requirements for the content of the document and procedural requirements for submission of the document to national agencies (Environmental Protection Agency, Radiation Protection Centre and VATESI) for revision, the revision procedure and procedure for submission to the European Commission.

7.2.2. Overview of regulations and guides issued by the regulatory body

The most significant regulations and guides issued by the regulatory body during reported period:

Regulatory system, inspection and enforcement:

- Order No. 22.3-37, 15th of June, 2011, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.1.2-2011 "Rules of Procedure for Confirmed Written and Published Public Consultations" (Official Gazette, 2011, No. 76-3712) establishes procedure for providing confirmed written and published consultations to applicants, licensees and other interested persons.
- Order No. 22.3-82, 25th of August, 2011, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.1.3-2011 "Inspections Conducted by VATESI" (Official Gazette, 2011, No. 107-5083), amended in 2012. Nuclear Safety Requirements establish the procedure of different types of inspections, carried out by the inspectors of VATESI. Nuclear Safety Requirements replace previous Requirements of a similar scope, which had to be reviewed and replaced with this document due to changes of concepts, procedure, etc., after the adoption of Law on Nuclear Safety and revised version of Law on Nuclear Energy.
- Order No. 22.3-106, 24th of October, 2011, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.1.4-2011 "Rules of Procedure for Applying the Enforcement Measures Set by VATESI" (Official Gazette, 2011, No. 129-6120), amended in 2012. The officials of VATESI are entitled to apply enforcement measures in a case of non-compliance with the requirements of VATESI, such as compulsory prescriptions (to eliminate the violations, to suspend particular activities within the terms set by the Head of VATESI, so shutdown the nuclear reactor or reduce the power of the reactor, to suspend the operation of other installations or other activities) pursuant to Law on Nuclear Safety, administrative penalties pursuant to the Code of the

Administrative Offences for the natural persons and penalties for legal persons pursuant to Law on Nuclear Safety. Nuclear Safety Requirements BSR-1.1.4-2011 establish detailed procedures of the application of the enforcement measures mentioned above.

Site selection and approval:

- Order No. 22.3-58, 20th of July, 2010, approved by the Head of VATESI On the approval of Nuclear Safety Requirements BSR-2.1.3-2010 "General requirements on site evaluation for nuclear power plants" (Official Gazette, 2010, No. 91-4845), amended in 2012. The regulation set the main requirements for site evaluation as well as proposals to use IAEA standards and guides for more detail analysis. The regulation let to evaluate site without specific design of the nuclear power plant taking into account that further safety related site analysis is going to be performed during design process. The regulation foresees periodic review of site evaluation. The regulation together with the Paragraph 1 of the Article 32 of the Law on Nuclear Safety and The Resolution No. 83, January 25th, 2012, of the Government of the Republic of Lithuania on the approval of Rules of Procedure of the Assessment of the Nuclear Power Plant's Site Evaluation Report provides legal basis for nuclear power plant site evaluation concerning nuclear safety together with security aspects.

Radiation protection:

- Order No. 22.3-89, 27th of September, 2011, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.9.1-2011 „Limits of Radioactive Discharges into Environment from Nuclear Facilities and Requirements for a Plan for Radioactive Discharges into Environment" (Official Gazette, 2011, No. 118-5599). Nuclear Safety Requirements establish the limits of the discharges of the radionuclides from nuclear facilities to atmosphere and water, including methodology for calculating of activities of radionuclides discharged to environment, requirements for the preparation and submission of the Plan of Discharge of Radionuclides and requirements for the control of the discharges.
- Order No. 22.3-90, 27th of September, 2011, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.9.2-2011 "Derivation and Use of Clearance Levels of Radionuclides for Materials and Waste Generated during Activities in the Area of Nuclear Energy" (Official Gazette, 2011, No. 118-5608). Nuclear Safety Requirements establish conditions and criteria for the removal from regulatory control of materials, waste, devices, installations and structures, emerging or used in nuclear activities and contaminated with radionuclides or having radionuclides in them. The Requirements also provide for the limits of decontamination of materials and waste for removal of regulatory control. The Requirements do not apply to liquid radioactive waste and containers and vehicles contaminated during transportation of radioactive material.
- Order No. 22.3-95, 6th of October, 2011, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.9.3-2011 "Radiation Protection at Nuclear Facilities" (Official Gazette, 2011, No. 122-5798). Nuclear Safety Requirements BSR-1.9.3-2011 establish the radiation protection requirements for workers, particular risk groups of workers which work in the nuclear installations constantly or temporary and other natural persons, conducting activities in nuclear installations, including general radiation protection requirements at nuclear facilities, requirements for admission to controlled and supervised areas, requirements for internal procedures of licensee for insuring radiation protection, requirements for establishing dose constraints for outside workers, monitoring of ionizing radiation and workplaces of workers and outside workers, requirements for personal protective equipment, radiation control system, application of ALARA principle, training, etc. Requirements for the radiation protection program are also established in this legal document.

Safety of nuclear installations:
Management system:

- Order No. 22.3-56, 21st of June, 2010, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.4.1-2010 "Management System Requirements" (Official Gazette, 2010, No. 75-3852). The regulation sets requirements for establishment, implementation, assessment and continuous improvement of the management system of the licensees acting in the field of nuclear energy. It also defines basic requirements for development of safety culture. The regulation is based on IAEA Safety Standard "Management systems for facilities and activities", GS-R-3.

Design and operation:

- Order No. 22.3-117, 25th of November, 2011, approved by the Head of VATESI On the approval of Nuclear Safety Requirements BST-2.1.4-2011 "Preparation and Use of the Nuclear Power Plant's Safety Analysis Report" (Official Gazette, 2011, No. 148-6981). Nuclear Safety Requirements provide the basic requirements of structure, content and form of the safety analysis report (preliminary, updated and final) of a nuclear power plant.
- Order No. 22.3-91, 26th of November, 2010, approved by the Head of VATESI On the approval of Nuclear Safety Rules BST-2.1.1-2010 "Design, installation and operation of electric power supply systems" (Official Gazette, 2010, No. 141-7239).
- Order No. 22.3-60, 30th of July, 2010, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.8.1-2010 "Notification on Unusual Events in Nuclear Power Plants" (Official Gazette, 2010, No. 94-4975). Requirements set criteria and form for notification of VATESI about unusual events and content of corresponding information on the event.
- Order No. 22.3-99, 7th of October, 2011, approved by the Order of the Head of VATESI on the approval of Nuclear Safety Requirements BSR-1.8.2-2011 "Categories of Modifications of Nuclear Installations and Procedure of Performing the Modifications" (Official Gazette, 2011, No. 123-5856). The Requirements establish categories of modifications of nuclear installations and assigns the licensee with the responsibility to document the modification process, carry out safety assessments and in the case of safety related modifications – to submit documents for the approval of VATESI. The Requirements replace a previous version of requirements of a similar scope.

Radioactive waste and spent fuel management:

- Order No. 22.3-120, December 31st, 2010, approved by the Head of VATESI On the approval of Nuclear Safety Requirements BSR-3.1.2-2010 "Regulation on the Pre-disposal Management of Radioactive Waste at the Nuclear Facilities" (Official Gazette, 2011, No. 3-121) establish requirements for pre-disposal management of radioactive waste at the nuclear facilities and is applied to all types of radioactive waste, generated during operation and decommissioning of nuclear power plants and other nuclear facilities, except spent nuclear fuel, and other radioactive waste sent for storage and (or) reprocessing, managing until their disposal at repositories.

Emergency preparedness:

- Order No. D1-136/22.3-15, February 10th, 2012, approved by the Minister of Environment of the Republic of Lithuania and Head of VATESI "On Exchange of Information in Case of Extreme Radiological Situations" (Official Gazette, 2012, No. 61-3098) establishes detailed procedure of the exchange of information in case of extreme radiological situations between several main institutions having responsibilities in the area.

Nuclear Security:

- Order No. 22.3-37, 4th of April, 2012, approved by the Head of VATESI "On the Approval of Nuclear Safety Requirements BSR-1.6.1-2012 "Physical protection of nuclear facilities, nuclear material and nuclear fuel cycle material" (Official Gazette, 2012, No. 43-2138). The Requirements establish requirements for the physical protection of nuclear facilities, nuclear material (during acquisition, possession, usage and transportation) and nuclear fuel cycle material (during transportation), including the principals of physical protection, requirements for the system of physical protection, requirements for the division of the nuclear facility into physical protection zones, general requirements for preparation, revision, renewal and submission of the Security Plan. Requirements supersedes General Requirements of Physical Protection of Nuclear Facilities and Nuclear Materials, approved by the Order of the Head of VATESI No. 22.3-28, 13th of June, 2005 (the need for revision derived from the new Law on Nuclear Safety and the revised Law on Nuclear Energy, both adopted in 2011).
- Order No. 22.3-104, 4th of September, 2012, approved by the Head of VATESI "On the Approval of Nuclear Safety Rules BST-1.6.1-2012 "Preparation of the security plan" (Official Gazette, 2012, No. 105-5356) establish structure and contents of the Security plans, which have to be prepared, revised, renewed and submitted by the applicant or licensee. The Rules cover Security Plans for construction sites of nuclear facilities, nuclear facilities, acquisition, possession and usage of nuclear materials and transport of nuclear fuel cycle materials, and nuclear materials and fissile materials.

7.2.3. Overview of the process of establishing and revising regulatory requirements, including the involvement of interested parties

Pursuant to the Article 5 of the Law on Nuclear Safety, the Head of VATESI approves the nuclear safety requirements and the nuclear safety rules, mandatory to all persons acting in the field of nuclear energy and approves the description of the procedure for drafting the nuclear safety requirements and the nuclear safety rules (Nuclear Safety Requirements BSR-1.1.1-2011 "Rules of Procedure for Drafting of Nuclear Safety Requirements and Nuclear Safety Rules", approved by the Head of VATESI Order No. 22.3-58, 15th of June, 2009 (Official Gazette, 2009, No. 74-3052; 2011, No. 107-5082). The procedure of issuing these documents consists of these stages:

1. *Planning*. Pursuant to Nuclear Safety Requirements BSR-1.1.1-2011 "Rules of Procedure for Drafting of Nuclear Safety Requirements and Nuclear Safety Rules", the five-year Program for Development of Normative-Technical Documents, describing priorities and needs of the development of these documents in the different areas of nuclear safety (the Programme for 2010–2014 is currently in force; it is revised every year) and The Plan for drafting and review of Normative-Technical Documents (for each year) are approved by the Head of VATESI.
2. *Drafting*. The draft of nuclear safety requirements or rules is developed by specialists of VATESI and discussed internally.
3. *Agreement*. The draft of nuclear safety requirements or rules is provided for agreement of other state institutions (if needed) and for comments or proposals of other interested parties (licensees, such as INPP, RATA or VAE) by publishing it in the Database of draft legal documents of Seimas (Parliament of Republic of Lithuania) (the addressees get notifications about a new draft), which is a mandatory procedure. As the database is public, all drafts are also available for the comments of the public. If there are a lot of relevant and complex comments or proposals, meetings can be organized in order to discuss and solve the issues.
4. *Approval* by the Head of VATESI and *publishing* in the Official Gazette.

7.3. Article 7(2)(ii) – System of licensing

7.3.1. Overview of the licensing system and processes including types of licensed activity

The Law on Nuclear Energy and the Law on Nuclear Safety together with the regulations made under other laws establish the licensing system for activities related to nuclear materials or nuclear cycle materials (their transportation, acquisition, etc.), as well as for nuclear facilities of the following life-stages: site evaluation, design, construction, commissioning, operation, and decommissioning. The supervision of the closed radioactive waste repository, acquisition, keeping, use and transportation of nuclear or nuclear fuel cycle materials is also executed according to the laws mentioned above. This regulation should encompass the following areas:

- nuclear safety, radiation safety and physical security of nuclear facilities, nuclear and nuclear fuel cycle materials;
- fire protection of safety related structures, systems and components;
- emergency preparedness in nuclear facilities and during transportation of nuclear and/or nuclear fuel cycle materials;
- radioactive waste management safety;
- the release of radionuclides into the environment;
- management systems of legal entities engaged in a licensed activity and other activities involving nuclear and nuclear fuel cycle materials or carried out in nuclear facility as well as assessment of the nuclear facility construction site.

According to the Law of Nuclear Energy, the concept of nuclear facility includes:

- nuclear power plant,
- unit of nuclear power plant,
- non-power nuclear reactor,
- storage facility for nuclear materials,
- storage facility for radioactive waste,
- radioactive waste processing facility,
- radioactive waste disposal facility.

VATESI is a competent authority for the licensing of activities involving nuclear materials or nuclear cycle materials or carried out in nuclear facilities within the legally defined life-stages.

During the stage of site evaluation, VATESI shall review and assess the site evaluation report. The positive conclusions in respect of the site evaluation report shall be presented by the following institutions: the Ministry of Health, the Civil Aviation Administration, the Lithuanian Geological Survey, the Lithuanian Hydro Meteorological Service and the Fire Prevention and Rescue Department, in order to approve it. Before the design activities start, technical specification for design has to be approved by VATESI. Design of a nuclear facility has to be performed and assessed according to the requirements established by the competent institutions, including VATESI, Ministry of Environment, Ministry of Health, Ministry of Interior and other institutions involved according to the Law on Construction, the Law on Nuclear Energy and the regulations made under the Laws.

According to the Law on Nuclear Safety, the following types of licences and permits are established in order to be issued by VATESI:

- licence for construction of a nuclear facility (or facilities);
- licence for operation of a nuclear facility (or facilities);
- licence for construction and operation of a nuclear facility (or facilities);
- licence for decommissioning of a nuclear facility (or facilities);
- licence for supervision of a closed radioactive waste repository (or repositories);
- licence for transportation of nuclear fuel cycle materials, nuclear materials and other fissile materials with exception of the small amount as described in the Law;
- licence for acquisition, keeping and use of nuclear materials and other fissile materials

with exception of the small amount as prescribed in the Law;

- permit for first carry-in of nuclear fuel to site of nuclear power plant, unit or non-power nuclear reactor;
- permit for the first carry-in and testing of the nuclear facility using nuclear and/or nuclear fuel cycle materials;
- permit for first start-up of unit of nuclear power plant or non-power nuclear reactor;
- permit for industrial operation of the nuclear facility;
- permit for start-up of the nuclear reactor after its short-term shutdown;
- permit for shipment of radioactive waste generated in nuclear fuel cycle;
- permit for shipment of spent nuclear fuel.

Following the provisions of the Law on Radiation Protection VATESI issues licences and permits for the nuclear energy area activities involving the sources of ionising radiation, which mainly are a licence or a temporary permit to carry out activities under ionising radiation at a nuclear facility and a licence or a temporary permit to store, maintain sources of ionising radiation at a nuclear facility.

A licence for the construction of a nuclear facility may be granted only if the Parliament of Lithuania (in case of NPP) or the Government of Lithuania (in case of other facilities) has adopted a legal act on the facility.

Every licence may have licence conditions attached. Conditions attached to the licence ensure necessary control and enforcement of the purposes of the laws. Licence conditions should be observed during the construction, commissioning, operation and decommissioning stages of the facility.

As stipulated in the Law on Nuclear Safety, licences and permits shall be issued to legal entities or persons having sufficient technological, financial, management system, human, emergency preparedness, physical security capacities, capacities of safe storage, transportation, accounting for and control of nuclear materials meeting the provisions of IAEA and EURATOM for safeguard, allowing proper fulfilment of the conditions of the licensed activity and ensuring nuclear safety.

Lists of information and documents that applicant is required to provide for the issue of an appropriate licence or permit are established by the Resolution of the Government of Lithuania.

7.3.2. Involvement of the public and interested parties within the Contracting Party

The Figure A.1 (see Annex II) describes the involvement of the public and interested parties within Lithuania as established by the legislation provided in Article 7 (1) of the Report.

7.3.3. Legal provisions to prevent the operation of a nuclear installation without a valid licence

The Law on Nuclear Safety article 22, part 4 prohibits every activity associated with nuclear facility, nuclear materials and nuclear cycle materials without an authorisation issued by VATESI (licence or permit prescribed in the Law).

7.4. Article 7(2)(iii) – System of regulatory inspection and assessment

7.4.1. Regulatory strategies

VATESI regulatory inspections are conducted at all stages of the lifetime of a nuclear facility: during the evaluation of a construction site (site) for a nuclear facility, its design, construction, commissioning, operation or decommissioning stages, as well as in supervising the closed radioactive waste repository, procuring, storing or transporting nuclear and / or nuclear fuel cycle materials and / or dual use nuclear commodities. VATESI inspects applicants for obtaining licences and permits, license and permit holders, suppliers of goods or contractors performing works and other companies performing operations related to nuclear or nuclear fuel cycle materials. While performing inspection activities, it is critically important to adequately assess the current situation in the nuclear power sector, to identify priority areas in terms of radiation hazard so that the safety related issues would be

given proper attention. Every year VATESI develops a plan of inspections in accordance with the established criteria and with regard to the available human and financial resources. In addition to planned inspections as well as unplanned inspections which may be announced or unannounced are performed.

VATESI inspects those operations of an organization that are related to nuclear safety, radiation protection and physical security, control over dual use nuclear commodities and accounting of and control over nuclear materials. General Nuclear Safety requirements BSR-1.1.3-2011 „VATESI Inspections“ were approved by the order of VATESI Head on August 25, 2011. Based on these Requirements, VATESI quality management document The Procedures for Special Inspections and for Routine Inspections by VATESI was prepared and approved.

7.4.2. Overview of the regulatory inspection and assessment with regard to the safety of nuclear installations

Inspection activities during the period 2010 – 2012

Every December VATESI, having assessed the gained experience of previous inspection activities, having analysed the experience of organisations operating nuclear installations, the results of licensing, analysis of the safety improvement programme as well as other documents related to safety, VATESI specialists plan inspections for the coming year. Each year the following safety-related areas were inspected: training of INPP personnel, safety systems and safety-related systems (emergency core cooling system, emergency power systems, fire protection systems, system of protection against overpressure in the Main Circulation Circuit and others), management of beyond design basis accidents, quality management, management of radioactive waste, safety culture, ageing management, emergency preparedness, assessment of operational experience and others.

VATESI conducts four general types of inspections, namely Special inspections, Regular (routine) inspections, Technical inspections and Control Room operation inspections (see Figure 7.1).

Special inspections are carried out by VATESI inspectors to control the satisfaction of defined safety requirements, conditions of structures, systems and components, satisfaction of requirements defined in the normative technical documents of the licence holder.

Regular or routine inspections are periodically recurring activities which necessary to control the satisfaction of defined safety requirements by state management and supervisory bodies and by inspected organization.

Technical inspections are verification of technical conditions of nuclear facility’s separate systems, facilities and equipment, defined in the special (operation, test, repair and similar) technical normative documents. The objective of Technical inspections is to ascertain that the safety-related pressurized components at INPP (equipment and pipelines) have been manufactured, connected, installed, maintained and operated in accordance with the requirements of the regulations and operation manuals, as well as that they are in good condition and it is possible to use them in the course of the start-up – commissioning works and to operate the facility at the specified operational parameters (e.g. pressure and temperature).

Control Room operation inspections are inspections of personnel particular actions (activities) given in nuclear facility’s Technical Specification (the principal document that defines safety of INPP operation). These inspections were relevant when both reactors were in operation stage.

Usually Regular inspections, Technical and Control Room operation inspections are carried out by VATESI’s resident inspectors from Surveillance Division.

The results of an inspection are put down in report, and the organization that has been inspected is familiarized with them. If some violations of authorization requirements or unsatisfactory conditions are found during the inspection, the enforcement actions are applied in accordance with the procedure set forth by the laws. The inspection report together with the resolution of VATESI Head providing binding measures is sent to the organization. The latter, after having analyzed the resolution of VATESI Head regarding application of the enforcement measures, has to draw up a plan aimed at implementing the resolution of VATESI Head. VATESI performs supervision of the corrective

measures implementation plan.

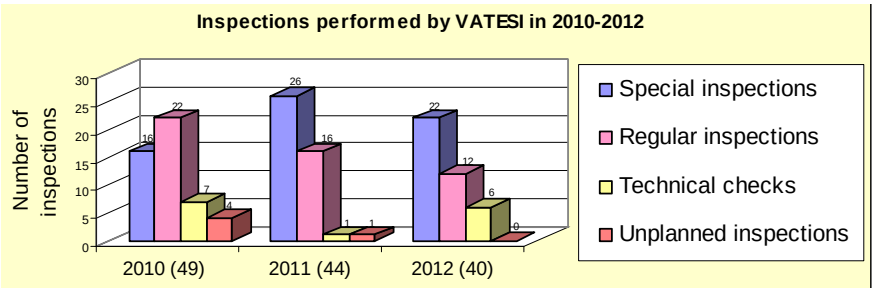

Figure 7.1 Inspections performed by VATESI in 2010-2012

7.4.3. Basic features of inspection programmes

VATESI's inspection activities concentrate on areas of safety significance. Basic features of inspection programmes are described in VATESI Nuclear Safety requirements BSR-1.1.3-2011 „VATESI Inspections" and quality management documents: The Procedure for Special Inspections by VATESI and The Procedure of Regular Inspections, Technical Inspections and Control Room Operation Inspections. List of organizations to be inspected and inspection areas are established considering following main criteria:

- Impact of activity to the nuclear facility's safety (Nuclear facility construction, operation, decommissioning, safety important structures, systems and components manufacturing or installation, implementation of nuclear facility modification etc);
- Number of shipments of nuclear and (or) nuclear cycle materials;
- Requirements, arising out of the international obligations for non-proliferation of nuclear weapons assumed by the Republic of Lithuania;
- Requirements, set out in Lithuanian legal acts;
- Nuclear safety review and assessment results;
- Pursuance of licenses or permission conditions terms.
- Inspections are planned and inspections areas are selected giving priority to the areas of higher risk.

Priorities of inspected activities are determined by risk, made by nuclear facility or licensed activity. This risk is estimated by performing analysis of present situation of:

- Licensed activity;
- Implemented or planned modifications;
- Unusual events;
- Performed safety analysis and results of VATESI review and assessment;
- Implementation of safety improvement program etc.

Periodicity of inspections is established considering results of previous inspections and essential events, which has influence on organization activities.

The annual inspections plan involves Special inspections, Regular inspections, Technical inspections and Control Room operation inspections. Comprehensive analysis of particular area (for instance, management of beyond design basis accidents, quality management, safety culture, ageing management, assessment of operational experience, implementation of modification) are performed during Special inspections. Also description of safety related areas, which should be cover during construction, operation or decommissioning, are described in The Procedure for Special Inspections by VATESI. Regular inspections are based on inspection areas (initiating events, safety systems, integrity of physical barriers, emergency preparedness, radiation protection, radioactive waste management), safety indicators (readiness of safety systems, integrity of fuel and others) as well as list of safety related systems (Emergency core cooling system, system of protection against overpressure in the Main Circulation Circuit, Accident confinement system, Service water system, Intermediate circuits, Electric power supply system, Reactor power control systems and others) which

are under supervision of VATESI.

7.5. Article 7(2)(iv) – Enforcement of applicable regulations and terms of licences

7.5.1. Power for legal actions

In performing the state regulatory and supervision functions of nuclear safety, pursuant to Article 11 Paragraph 2 the Law on Nuclear Safety, VATESI applies enforcement measures in the manner set out by the Law on Nuclear Safety and other legal acts, requires relevant persons to implement corrective measures and (or) to eliminate the violations, and supervises the implementation of such requirements.

7.5.2. Overview of enforcement measures available to the regulatory body

Enforcement measures are being applied in accordance with legal principal of graded approach. All enforcement measures which are used by VATESI are arranged progressively considering the character of violation.

VATESI is empowered to impose following administrative enforcement measures according to the Law of Nuclear Safety and other laws:

- to provide mandatory requirements to all licence or permit holders, committing them to eliminate the detected violations in nuclear safety, to suspend the works within the time-limits set by the Head of VATESI and/or to shut-down the nuclear reactor, to decrease its capacity, to discontinue operation of other equipment or activities according to Law on Nuclear Safety;
- to impose administrative fines on natural persons according to Code of Administrative Offences of the Republic of Lithuania;
- to impose fines on legal entities according to the Law on Nuclear Safety (otherwise known as economic sanctions).

Mandatory Requirements

Pursuant to the Article 6 of the Law on Nuclear Safety mandatory requirements are imposed on the legal entity in any of below listed cases:

- After the issuance of a licence or a permit it emerges that the information provided in the application and in other submitted documents was false, and within the time-limit prescribed by the Head of VATESI correct information is not provided;
- The licence or permit holder breaches the requirements of the legal acts;
- The licence or permit holder does not longer meet the requirements which it had met at the moment of issuance of the licence or permit, and fails to eliminate the detected violations within the time-limit prescribed in the notice of Head of VATESI as stated in the Law on Nuclear Safety;
- In case of failure to meet the requirements arising out of the international obligations for non-proliferation of nuclear weapons as assumed by the Republic of Lithuania;
- The licence or permit holder fails to meet, or meets improperly, the established terms and conditions of operation;
- On other occasions established by the Law on Nuclear Energy or other laws.

The Head of VATESI issues mandatory requirements as soon as the nuclear safety violations are detected in the activities of the licence or permit holder, taking into account the requirements for nuclear safety set by the Law on Nuclear Safety and other legal acts, as well as adhering to the nuclear safety requirements, the nuclear safety rules, the standards and the terms and conditions of the licence or permit. The type of mandatory requirements and their extent, on a case-by-case basis, have to be established upon evaluation of eventual threats, their impact on, scope of, and risk to residents, their property and the environment. The mandatory instructions have to be given on the basis of proportionality, justice, rationality and fairness.

Administrative sanctions for natural persons

According to Code of Administrative Offences of the Republic of Lithuania VATESI is empowered to impose administrative fines on natural person (for example, head of the legal entity) for the violations of the nuclear safety requirements. The Code of Administrative Offences sets down the administrative responsibility and sanctions for violations of nuclear safety rules and norms. Code of Administrative Offences sets liability and administrative sanctions (penalties) for natural person for following offences:

- noncompliance with normative and other legal acts regulating nuclear safety and radiation safety of nuclear energy activities involving sources of ionizing radiation;
- disobeying legal orders of the officials of VATESI or any other obstruction of carrying out their duties;
- disobeying mandatory requirements of VATESI to remove the detected violations of nuclear safety and (or) radiation safety of nuclear energy activities involving sources of ionizing radiation in given terms and conditions;
- disobeying mandatory requirements of VATESI to suspend the works within the set time-limits and/or to shut-down the nuclear reactor, to decrease its capacity, to discontinue operation of other equipment or activities according;
- contamination of the environment with radioactive material as well as transportation, use, storage, or disposal of radioactive material in violation of environmental requirements;
- shipment, transit or shipment of radioactive substances to/though/from the territory of the Republic of Lithuania without proper permit or licence;
- emissions to the atmosphere without proper authorization; emissions to the atmosphere in excess of norms or other conditions set in the permit or emissions to the atmosphere violating environmental norms set or legal acts regulating emissions to the atmosphere, when the permit is not required;
- noncompliance with the rules for using facilities and equipment to clean and control the emissions into the atmosphere, as well as their exclusion;
- goods, services, raw materials, the quality, the composition, complement and packaging do not meet technological standards, recipes, technical specifications (conditions), standards and other declared documents or statutory mandatory quality requirements, sale, delivery, implementation, as well as the sale of goods, providing services, realization of raw materials without documents confirming of the necessary quality and safety; noncompliance with standards, technical specifications (conditions) or the conditions set by the manufacturer during transportation or storage of goods or materials and during use of raw materials; Determination availability, quality and of the composition of goods or raw material in violation of the set order or the incorrect determination; intentional deterioration of quality indicators of goods or raw materials;
- improper use of the building;
- noncompliance with rules of building maintenance when there is a threat of deformation and collapse;
- noncompliance with rules of building maintenance;
- pursuit of commercial, economic, financial or professional activities without a license (permit) for activities which require a license (permit) or in any other illegal manner, as well as performing such actions using illegal employees;
- noncompliance with rules of licensing and control of export, import, transit and brokering of strategic goods; denying admittance of the officials performing the control of strategic goods to the premises and territory belonging to natural persons, legal entities or branches of foreign legal entities or other entities, where the strategic goods are stored or used, in order for the officials to examine the goods, to perform control tests and measurements, as well as not providing records, documents, information or withholding the documents, providing incorrect records or information, disobeying legal requests of these officials;
- intentional injury or peel of a stamp (seal), set by a competent official.

Economic sanctions for legal entities

VATESI is empowered to impose fines (the amount of the economic sanction varies from 0,75 up to 3 per cent calculated from the income, but not less than 125 thousand LTL. In case the offence is made repeatedly, economic sanctions varies from 1,25 up to 5 per cent calculated from the income, but not less than 250 thousand LTL). Economic sanctions are applied in case of particularly serious violations of legal acts that regulate nuclear safety and radiation safety in carrying out the nuclear energy related activities – they are imposed on legal entity which fails to act in line with the requirements established by the Law on Nuclear Safety and other legal acts that regulate nuclear safety, radiation protection in carrying out the nuclear energy related activities with the sources of ionising radiation, as well as physical security requirements and due to which the safety barriers are or might be breached and/or as a result of which the activity of radionuclides discharged into environment exceeds the allowed limit and/or the doses of exposure of workers exceed the allowed limits, and which fails to comply with the requirements arising out of the international obligations on non-proliferation of nuclear weapons assumed by the Republic of Lithuania, and this is related to significant quantities of nuclear materials defined by the IAEA.

Criminal Sanctions

In case of a crime or a misdemeanour, VATESI transmits the information about it as soon as possible to the prosecutor or to the investigating officer who are empowered to bring the case to the court and then public works, fines, restriction of freedom or imprisonment can be imposed on natural person or legal entity. The Criminal Code sets down the liability and criminal sanctions for these crimes and misdemeanours involving nuclear facilities and nuclear or radioactive material:

- terror act;
- unlawful possession of nuclear or radioactive materials or other sources of ionizing radiation;
- threat to use or otherwise influence or unlawfully acquire nuclear or radioactive materials or other sources of ionizing radiation;
- violation of the regulations governing lawful possession of nuclear or radioactive materials or other sources of ionizing radiation;
- manufacture of plant explosives, explosives or radioactive material or development or distribution of production technology of these materials;
- smuggling of nuclear or radioactive materials or other sources of ionizing radiation.

Other enforcement measures

VATESI is empowered to take the following actions related to the issued licences and permits:

- warn the legal entity about suspending of the license, permit;
- suspend the license, permit;
- revoke the license, permit.

7.5.3.Experience with legal actions and enforcement measures.

In the period of 2011–2013 VATESI issued two kinds of mandatory requirements:

- to eliminate detected violations of the nuclear safety requirements and rules (to take remedial actions);
- to suspend the work at a nuclear facility in case of failure to fulfil the licence conditions and (or) in case the activity contradicts to the requirements of legal acts.

The mandatory requirements were issued separately as mandatory executive directions.

ARTICLE 8 REGULATORY BODY

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.

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. Article 8(1) – Establishment of the regulatory body

8.1.1. Legal foundations and statute of the regulatory body

In accordance with national legislation, the Convention on Nuclear Safety, other international conventions and treaties, the Republic of Lithuania undertakes appropriate measures to ensure the safety of nuclear installations under its jurisdiction through the establishment of legal framework and infrastructure necessary to maintain the effective nuclear safety regulatory system. VATESI – State Nuclear Power Safety Inspectorate – was established by the Decree of Government on 18 October 1991 to regulate and supervise the safety of nuclear power facilities within the territory of Lithuania. On 21 October 1992, the Government of the Republic of Lithuania approved the Statute of VATESI assigning its main duties, functions and rights. VATESI activities are financed by the Lithuanian state budget appropriations and other legitimate income.

On October 1, 2011 the amendments of the following main laws related to nuclear and radiation safety came into force: Law on the Management of Radioactive Waste (new edition), Law on Nuclear Energy (new edition), Law on Radiation Protection (amendments) and additionally new Law on Nuclear Safety. As a result, a new edition of the Statute of VATESI was approved by Government resolution No. 1406 of 21st of November 2012. After the changes were made in the laws, regulation and supervision of radiation safety were distinguished between VATESI and Radiation Protection centre. VATESI became solely responsible for supervision of radiation safety within nuclear energy field (Radiation Protection Centre is no longer taking part in the licensing process of nuclear facilities) as well as responsible for regulation and supervision of releases and discharges from nuclear facilities and free release measurement. According to the amended laws functions control of efficiency of physical security of nuclear power plants and other nuclear facilities, of evaluation of design basis threats of nuclear facilities and of acquisition, possession, usage and shipment of nuclear materials in quantities exceeding the ones established in Annex 1 to the Law on Nuclear Safety and regulation and supervision of physical security during shipment of nuclear fuel cycle materials were delegated to VATESI. Other areas of responsibilities rest as previous. Government resolution No. 1406 of 21st of November 2012 also revoked the Statute of the Board of VATESI.

VATESI works in accordance to strategic action plan approved by the Government (pursuant to amendments to the Law on Nuclear Energy, which came into force on 1st of July, 2013, the strategic action plan is to be approved by the Head of VATESI) and in accordance to the annual plan approved by the Head of VATESI.

8.1.2. Mandate, mission and tasks

VATESI is state regulatory and supervisory authority in Lithuania for activities involving nuclear materials and other activities in the area of nuclear energy involving sources of ionising radiation. VATESI sets safety requirements and regulations, supervises compliance with them, applies enforcement measures in case of incompliance with safety requirements and regulations, issues

licenses, permits and temporary permits, assess safety of nuclear facilities.

The mission of VATESI is to exercise the state regulation of, and supervise over the nuclear installations and the activities related to nuclear and nuclear fuel cycle materials, in order to protect the society and the environment against the harmful impact of exposure to ionising radiation.

The main tasks of VATESI in the area of nuclear safety is regulation and implementation of state regulation and supervision of nuclear safety, radiation safety of nuclear energy activities involving sources of ionizing radiation, physical security of nuclear installations, nuclear materials and/or nuclear fuel cycle materials and accountancy and control of nuclear materials as well as supervision of requirements arising from international nuclear weapon non-proliferation obligations of Republic of Lithuania.

Other tasks of VATESI:

- preparation and submission of national reports in accordance with international conventions and agreements;
- taking part in the activity of the IAEA, missions, commissions and committees of safety experts – advisors;
- within VATESI competence, co-operates with and participates in international organisations, associations and forums (ENSREG, WENRA, EURATOM, etc.);
- developing and maintaining multilateral and bilateral cooperation (with the IAEA, Sweden, Finland, Germany, the US, Japan, the UK, etc.).

Decisions are taken independently by VATESI in carrying out its the statutory functions. VATESI responsibilities are kept apart from other institutions, agencies or organizations engaged in development of nuclear energy or nuclear energy utilization features.

8.1.3. Authorities and responsibilities

The Law on Nuclear Energy (last amendment in 2012) provides for main legal authority and responsibilities of Regulatory Body. Furthermore, the duties and responsibilities of VATESI are stated in the Statute of VATESI (Government resolution No. 1406 of 21 of November, 2012).

According the Law on Nuclear Energy VATESI performs the following functions:

- exercises functions of the state regulation and supervision of nuclear safety, physical security of nuclear installations, nuclear materials and the nuclear fuel cycle materials, accounting for and control of the nuclear materials, also of radiation safety in operating nuclear installations;
- monitors the compliance with the requirements set forth by the legal acts for activities in the area of nuclear energy subject to licences or permits and monitors exercising of the rights and obligations of licence holders and/or permit holders;
- drafts and approves the requirements and rules for nuclear safety, radiation safety in the area of nuclear energy, accounting for and control of the nuclear materials, physical security of nuclear materials and the nuclear fuel cycle materials mandatory to all the state and municipal authorities, also to all the persons engaged in such activities;
- supervises the compliance with requirements of the legal acts regulating nuclear safety, radiation safety in the area of nuclear energy, physical security of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of the nuclear materials;
- analyses and assesses the documents submitted by applicants for obtaining a licence or a permit, also the documents submitted by licence holders or permit holders or other persons, adopt relevant decisions regarding such documents, review and evaluate the nuclear safety;
- supervises and inspects applicants, licence and permit holders or the persons rendering services, supplying goods or performing works for them or other persons engaged in activities pertaining to nuclear materials and nuclear fuel cycle materials;

- in the cases specified in the laws and other legal acts issue, suspends licences and permits, revokes suspension of licences and permits, or cancels licences and permits, establishes or changes their terms, supervises compliance with such terms;
- subject to coordination with the Ministry of Health establishes norms for release of radionuclides from nuclear installations and monitors compliance with the norms for release of radionuclides;
- drafts and approves the modification categories of a nuclear installation and a description of the procedure for carrying out modifications;
- cooperates with foreign institutions exercising state regulation and supervision in the sector of nuclear energy, within its competence participate in activities of international organisations and institutions, committees and groups of the European Union;
- within its competence and in accordance of legal acts prepares and/or submits to the Government the draft laws and legal acts of the Republic of Lithuania on the issues of nuclear safety, physical security of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of nuclear materials, also of radiation safety in carrying out nuclear energy related activities involving sources of ionising radiation;
- prepares and submits to the Government or its authorised institution proposals regarding the national policy and strategy in the sector of nuclear energy and implementation thereof;
- prepares and submits to the Government or its authorised institutions proposals regarding improvements of the system ensuring nuclear safety, radiation safety in the area of nuclear energy, physical security of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of nuclear materials;
- in the event of a nuclear and/or radiological accident provides the interested state and municipal authorities with the time-critical information about the radiation situation in the nuclear installation, estimated threats of the nuclear and/or radiological accident and other related information.

8.1.4. Organizational structure of the regulatory body

The structure and competence of VATESI and its resources corresponds with the nature and scope of the activities in the field of nuclear energy, activities involving nuclear materials and other activities in the field of nuclear energy involving sources of ionising radiation undertaken and planned to be undertaken in the Republic of Lithuania.

VATESI functions are performed according to the legal acts by VATESI state officials, public servants and employees working under employment contracts. VATESI is headed by its Head, who has two Deputy Heads. The Head is appointed by the President on the proposal of the Prime Minister for a term of six years. The Deputy Heads are appointed by the Prime Minister on the proposal of the Head of VATESI for a term of six years.

VATESI structure consists of 14 divisions directly subordinate to the Head of VATESI, Deputy Heads or the Director of Administration Department. Divisions are headed by heads of divisions. The Head of a division may have a deputy. Work of a particular division is organized in accordance with the statue of the division and job descriptions of VATESI state officials, public servants and employees, approved by the Head of VATESI. Heads of divisions are personally responsible for the tasks and functions assigned to their units, and organization of labour discipline inside the division as well as they are responsible for implementing delegated tasks by the Head, Deputy Heads or Director of the Department, taking into account the subordination.

VATESI administrative structure was renewed according to the amendments of the laws mentioned above. A current organizational structure is provided in Annex III Figure A.2.

8.1.5. Development and maintenance of human resources over the past three years

Pursuant to the amendments and adopted new laws in 2011, there were changes of responsibilities and functions regarding the radiation safety regulation and supervision of nuclear facilities. All functions of the radiation safety regulation and supervision of nuclear facilities were

assigned to VATESI. Overall number of VATESI staff increased by 4 positions over the reported period.

From the beginning of the year 2010 until the beginning of 2013 there was a natural turnover of staff: 1 person has retired, 11 public servants left VATESI for different reasons and 12 new public servants were hired to take their place and additional 2 public servants were hired to fill in new established positions. At the end of the year 2012 the number of VATESI full-time staff positions was 74, and 69 of these 74 positions were filled (58 public servants, 8 employees under employment contracts and 3 state officials).

8.1.6. Measures to develop and maintain competence

One of the most important goals of VATESI in order to complete regulatory functions in a timely and appropriate manner is to maintain highly qualified and equipped with special knowledge personnel.

Over reported period different methods of training – formal training (courses, workshops), introductory training of public servants, initial internal training, lecturing by VATESI employees, self study, work with more experienced specialists – were used in order to maintain the qualification of more experienced employees and to train new employees. Dividing by topic, training included training of basic administrative skills and abilities, needed for public servants, and training of special professional knowledge (e.g. specific nuclear technologies).

In 2010 55 VATESI employees and public servants improved their skills at different training events in Lithuania and abroad. Two of six new employees participated in introductory training courses. In 2011 52 VATESI employees and public servants participated in different training events. One of two new employees took part in the introductory training courses of civil servants.

Accordingly in 2012 almost 90% of VATESI employees and public servants (61 of 69) participated in the different training events and training courses.

Over reported period VATESI specialists also actively participated in the qualification improvement events arranged by the IAEA. In all, 41 VATESI specialists took part in 67 training events, organized by IAEA in 2010, 63 training events arranged by IAEA were attended by 40 VATESI specialists in 2011 and 65 training events by 41 VATESI specialists in 2012. Also VATESI specialists have a possibility to participate in training events arranged by other international organisations.

8.1.7. Developments with respect to financial resources over the past three years

In the past three years VATESI was financed by State Budget. VATESI is a state-financed institution financed from the national budget. VATESI budget is approved every year in the framework of the State Budget allocated to all state administrations. VATESI drafts its budget proposal and presents it to the Ministry of Finance and the Government for consideration. The final State Budget is approved by the Parliament of Republic of Lithuania.

8.1.8. Statement of adequacy of resources

Over the reported period, during which VATESI was financed from State Budget, VATESI financial resources were adequate to its needs. In view of changes in the legislative framework (see Section 8.1.1.) and changes of responsibilities and functions between the institutions, VATESI recruited additional staff (see Section 8.1.5.), therefore over reported period human resources were adequate to VATESI needs.

8.1.9. (Quality) management system of the regulatory body

VATESI's quality management system was established in 2000. Later on VATESI's quality management system was improved and the edited quality management system introduced by Order of October 13th, 2010, No. 22.3-69 approved by the Head of VATESI. The main goals of VATESI quality management (further – QM) system are:

- to carry out the statutory functions in accordance with the requirements, qualified and in accordance with terms;
- to improve the institution management efficiency using a procedural approach;
- to improve quality and efficiency of services and practice;
- to participate in international institutions programs, projects and work groups, and to install advanced concepts and principles to VATESI activities;
- to document VATESI practice in the way that it could be traced back to the decision-making method and basis;
- to achieve continuous and stable VATESI performance evaluation based on the self-assessment results to improve the quality management system VATESI;
- to ensure proper VATESI personnel qualification.

VATESI QM documentation is divided into five levels:

- The highest level – VATESI QM Policy;
- The first level – VATESI QM Manual and internal regulating legal acts assigning procedures of VATESI organization (Statute of VATESI, VATESI procedure regulation);
- The second level – VATESI internal regulations assigning procedural descriptions and regulations of the divisions;
- The third level – VATESI internal regulations imposing detailed requirements on how to perform specific tasks (instructions, procedures), job descriptions;
- The fourth level – other QM system records (acts, records, reports, orders, etc.).

According to the continuous improvement of quality assurance documents, during the reporting period VATESI approved 3 and revised 6 quality management system procedures and instructions.

In 2012 VATESI initiated project „Quality management system implementation at VATESI“, financed from the EU structural funds. The aim of the project is to update and improve the management system in VATESI. On the 21 March 2013 a funding and administration agreement for project “Quality management system implementation at VATESI” was signed between VATESI and The European Social Fund Agency. VATESI plans to implement a QM system according to LST EN ISO 9001 and the International Atomic Energy Agency's Standard GS-R-3 requirements, and computerize internal processes and procedures.

International standards of QM activities will increase the internal efficiency of managing and improving the quality of public administration in VATESI. The project will improve licensing processes, reduce document processing terms and reach more effective communication with applicants and license holders. It is expected that the QM system will enable VATESI as nuclear state regulation organization to be more efficient of both existing and new nuclear power facilities. The project is scheduled until August 2015.

8.1.10. Openness and transparency of regulatory activities including actions taken to improve transparency and communication with the public

VATESI and the licence holders must inform both the state and municipal institutions and the general public as well as other persons whose business activities are directly related to the licensed activities of a relevant licence holder about the conditions of nuclear safety in the manner required under the Law on Provision of Information to the Public of the Republic of Lithuania and other legal acts. The organisations operating nuclear installations also must inform general public about the measures that are foreseen in the emergency preparedness plans which may have an impact on regular living conditions. VATESI has to deliver public announcements on the results of supervision the implementation of nuclear safety requirements. While implementing its supervision functions VATESI provides confirmed written and/or public consultations to the legal entities that submitted written requests and/or questions or provides public consultations on its own initiative.

The main means of ensuring the transparency of the decisions:

- draft legal documents are public in order to inform and get a response (suggestions, remarks, comments) from interested parties (also see Section 7.2.3.);
- consultations and meetings are organized on different issues with interested parties;
- regular public announcements on the information about the condition of nuclear safety in the Republic of Lithuania are announced;
- information on nuclear safety is prepared and disseminated using these methods:
- reports on conventions and other legal acts of Lithuania, EU, international institutions;
- VATESI annual reports (Nuclear Power Safety in Lithuania) and annual reports to The President and the Government in terms of its activities and finances;
- VATESI website, press releases and other publications;
- possibility for students from universities to visit VATESI.

8.1.11. External technical support

The purpose of the system of scientific technical support of nuclear safety is to assist VATESI in performing its regulation and supervision functions and assist the licence holders in ensuring and improving nuclear safety. This support is provided in the form of consultations during the design, construction, performing scientific or expert investigations and other works, which require high scientific technical qualification, competence, special knowledge and skills. The system of scientific technical support of nuclear safety shall comprise the following:

- the Lithuanian and foreign institutions engaged in studies, scientific research, design and construction and in other activities as well as the other legal entities – the scientific technical support organisations (the TSO), having required scientific technical qualifications, competence, special knowledge and skills in the area of assurance, regulation and monitoring of nuclear safety;
- experts and consultants having requisite scientific technical qualification, competence, special knowledge and skills in the area of assurance, improvement, regulation and supervision of nuclear safety.

VATESI cooperates with the TSOs of Lithuania as well as of foreign countries, which provide VATESI with expertise and necessary technical-scientific support during safety reviews, verification of safety justifications, drafting of legal acts. Some TSOs are involved in international projects implemented through international and bilateral cooperation, coordinated by VATESI.

Pursuant to Article 45 of the Law on Nuclear Safety, in selecting specific contractors, the principle of impartiality of the contractors shall be applied. The TSOs or experts and consultants which have already participated in preparing the documents on a nuclear installation design or the documents required for the evaluation of nuclear safety that were submitted when obtaining a licence or participated in the preparation of such documents under request of the licence holder, shall not participate in performing the review and assessment of the same documents. The TSOs and the experts and consultants shall declare compliance with this requirement and their impartiality in the course of their selection carried out in the manner set out by the legal acts.

During the reporting period the main VATESI cooperation directions with the Lithuanian TSOs are following:

- the evaluation work of decommissioning, equipment decontamination and dismantling of nuclear facilities at the INPP;
- expert services for VATESI in terms of the technical documents and the justifications of the INPP;
- new regulatory documents governing the nuclear safety preparation and updating of existing documents.

The main TSOs are Lithuanian Energy Institute, Kaunas University of Technology, Vilnius Gediminas Technical University, Centre for Physical Sciences and Technology and etc.

8.1.12. Advisory committees

Support to VATESI in the area of decommissioning has been an ongoing action since 2001 and is continued under the Ignalina Programme. Currently VATESI implements the sixth project. First of all it was focused on training. However after the general skills and competences have been built up, it is used for reviews of decommissioning-related submittals by technical support organisations. The main technical support organizations of Western Europe and Lithuania that participate in the project are following: Riskaudit (as managers of the project), IRSN (France), GRS (Germany), Bel V (Belgium), STUK (Finland), Kaunas University of Technology (Lithuania), former Institute of Physics (Lithuania).

Technical support organisations are engaged to review decommissioning-related submittals, assisting VATESI in identification of requirements, documentation analysis, providing recommendations for improvements and conclusions, and performing test calculations, if needed. The consultants prepare a review of the relevant submittal (Dismantling and Decontamination Project, Technical Design Documentation, Safety Analysis Report, etc.) reports and as part of the review support work, representatives from the consultant also participate in meetings between the VATESI and INPP, the producers of the documents reviewed.

The submittals related to the following projects from the Ignalina NPP decommissioning programme are planned to be subject to review under the current project:

- Interim storage facility for spent nuclear fuel assemblies;
- Solid radioactive waste retrieval facility from the existing storage facilities and new treatment and storage facilities for INPP;
- INPP dismantling and decontamination projects;
- Repository for very low level radioactive waste disposal and the buffer storage facility;
- Low- and Intermediate-level short-lived radioactive-waste repository;
- Transformation of the bituminised waste storage facility to repository.

It is planed that the current Project will last up to the year 2020.

It is also worthwhile mentioning, that implementing its duty to establish requirements and rules in the field of nuclear safety VATESI prepares drafts of legal acts and submits them for remarks and proposals to the state institutions, licence holders, TSOs and the public (also see sections 7.2.3 and 8.1.11).

8.2. Article 8(2) – Status of the regulatory body

8.2.1. Place of the regulatory body in the governmental structure

Over reported period there were changes of VATESI's position in Governmental structure as shown in Figure A.3 (see Annex IV). According to the amendment of the Law on Nuclear Energy VATESI is an independent state institution accountable to the Government and the President of the Republic of Lithuania since the 1st of October, 2011 (for additional information see Sections 8.1.1. and 8.1.3.).

VATESI is an independent state institution exercising the state regulation and supervision of nuclear safety, activities involving nuclear materials and other activities in the area of nuclear energy involving sources of ionising radiation which acts in accordance with the Law on Nuclear Safety, other laws and the Statute of VATESI. Supplementary to the Law on Nuclear Energy, other laws and legislative acts state the duties and competence of other state institutions and regulatory bodies, which provide VATESI with their respective statements before the regulatory authorization is granted by VATESI. The competence of other state institutions is described in detail in Annex IV.

8.2.2. Reporting obligations (to the parliament, government, specific ministries)

The Head of VATESI is responsible for activities of VATESI and accountable to the President and the Government. VATESI informs other national and international bodies about its activities according to the national and international legal acts and treaties. In accordance with national legislation, VATESI coordinates its activities with other state bodies and institutions responsible for radiation safety and health care, emergency preparedness, civil protection, environmental protection, industrial safety and supervision of potentially dangerous industrial facilities.

By 1st May each year VATESI has to submit an annual report on activities of VATESI and a set of financial statements to the President and to the Government of the Republic of Lithuania and have to make them public in the manner laid down in the legal acts. The President and the Government may invite the Head of VATESI to present the annual results of VATESI in terms of its activities and finances.

Not later than before 22 July 2014 VATESI has to submit a first report to the European Commission on the implementation of Council Directive 2009/71/EURATOM of 25 June 2009 Establishing a Community Framework for the Nuclear Safety of Nuclear Installations and thereafter such reports are submitted every three years, subject to the stages established by the Nuclear Safety Convention with respect to the review and submission of notices.

8.2.3. Means by which effective separation of the regulatory body from the agencies responsible for promotion of nuclear energy is ensured

National legislation provides clear division between the responsibilities and functions of VATESI and those organizations or bodies engaged in development/promotion of the nuclear energy or use of nuclear energy, including production of electricity.

The Law on Nuclear Energy provides a legal basis for the activities in the area of nuclear energy, also the responsibilities of the state and municipal authorities in carrying out their functions in developing and implementing the nuclear energy policy as well as public administration, state regulation and supervision of the activities in the area of nuclear energy. A licence holder or a permit holder is responsible for compliance of the activities pursued thereby with the requirements of the Law on Nuclear Energy, the Law on Nuclear Safety, the Law on Radiation Protection, the Law on Management of Radioactive Waste, other laws and legal acts. Nuclear installations belong by the right of ownership to the State and/or to legal entities holding licences provided for by the laws. A legal entity holding a nuclear installation by the right of ownership operates the nuclear installation and/or pursues other activities in the area of a nuclear energy as provided by the laws only subject to a valid licence or permit.

The main means by which the independence of the regulatory body is assured:

- *Division of functions among the authorities.* Many state authorities take part in regulating the activities in the area of nuclear energy. The Government of Republic of Lithuania sets strategic directions of the state policy in the area of nuclear energy, approves the rules for issuance of licences and permits for activities in the sphere of nuclear energy or shall assign approving of such rules to the authorised institution, etc. The Ministry of Energy of the Republic of Lithuania develops the State policy in the area of nuclear energy and organises, coordinates and controls its implementation, organises the development of the infrastructure of the nuclear energy in the Republic of Lithuania, etc. Other state and municipal authorities and institutions such as the Ministry of Health of the Republic of Lithuania and its authorised institutions, the Ministry of Environment of the Republic of Lithuania and its authorised institutions, the Ministry of Social Security and Labour of the Republic of Lithuania and its authorised institutions, the Ministry of Education and Science of the Republic of Lithuania, the Ministry of National Defence of the Republic of Lithuania, the Ministry of the Interior of the Republic of Lithuania and its authorised institutions, the State Security Department of the Republic of Lithuania take part in regulating the activities and its consequences in the area of nuclear energy in accordance to their competence. Their functions are clearly stated in legal

documents (see Annex IV) and do not duplicate functions of VATESI.

- *Decision-making power*. Paragraph 3 of Article 23 of the Law on Nuclear Energy states, that VATESI has a power to take decisions independently in carrying out its statutory functions. VATESI responsibilities are kept apart from other institutions, agencies or organizations engaged in regulating, control, administration or development of nuclear facilities. To address nuclear safety issues, functions are clearly divided between the operating and regulatory institutions. In case there is a need to get information or estimation of other institution, the procedures and responsibilities of each institution are clearly described in legal acts.
- *Liability for the nuclear safety.* According to the Law on Nuclear Safety 16 Article, full liability for the nuclear safety of a nuclear installation and for nuclear safety in carrying out other activities with nuclear and/or nuclear fuel cycle materials shall solely fall on persons that are engaged in such activities and hold relevant licences and/or permits. According to Article 18 organisation operating a nuclear installation and other holders of licences and/or permits have to develop an organisational structure which would ensure the fulfilment of nuclear safety policy formation, implementation and control functions. For example, currently the INPP is responsible for safe preparation for decommissioning of nuclear reactors and has been granted the status of the operating organisation. The Maišiagala Radioactive Waste Storage is operated by the State Company Radioactive Waste Management Agency, and the Public Limited Liability Company Lietuvos Geležinkeliai has a license for the transportation of nuclear materials.
- *Place of the regulatory body in the governmental structure, appointment of officials*. As it was indicated, VATESI acts as independent governmental institution subordinated directly to the Government and the President, hence its place in the governmental structure helps to assure an effective separation of the regulatory body from the agencies responsible for promotion of nuclear energy. Pursuant to Paragraph 10 of the Article 23 of the Law on Nuclear Energy, the Head and Deputy Heads of VATESI in their official capacity shall act independently from the persons engaged in activities in the field of the nuclear energy sector, also from other agencies, institutions or organisations engaged in expansion of the nuclear energy or use of nuclear energy, including generation of electricity. Independent activities imply a prohibition to be a member of a body of a legal entity, to accept other remunerated or public positions, to provide services or consultations, except the ones provided acting in the official capacity at VATESI, or to be engaged in other activities due to which a certain person, other agency, institution or organisation acting in the nuclear energy sector would or might gain unjustified competitive advantage over the persons engaged in relevant activities. A breach of this requirement shall be qualified as a serious misconduct.

ARTICLE 9 RESPONSIBILITY OF THE LICENSE HOLDER

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

9.1. Formulation in the legislation assigning the prime responsibility for safety to the licence holder

On the 1st of October, 2011, the Law on Nuclear Safety of the Republic of Lithuania came into force. Article 3 of the Law determines basic principles for ensuring nuclear safety where the first one is the principle of liability for ensuring nuclear safety (for all principles see Section 10.1).

Article 3 of the Law on Nuclear Energy of the Republic of Lithuania identifies the legal principles of activities involving nuclear materials and other activities in the field of nuclear energy involving sources of ionising radiation. The first paragraph of the article states, that activities involving nuclear materials and other activities in the field of nuclear energy involving sources of ionising radiation in the Republic of Lithuania shall be permitted only subject to a licence or a permit issued by an authorised state institution. If such activities are conducted without a licence or a permit, they shall be held illegal and shall incur legal responsibility as provided by the laws of the Republic of Lithuania. The second paragraph states, that a licence holder or a permit holder shall be liable for compliance of the activities pursued thereby with the requirements of this Law, the Law on Nuclear Safety, the Law on Radiation Protection, the Law on Management of Radioactive Waste, other laws and legal acts. The final paragraph of the article defines, that an applicant having filed an application for a licence or a permit, and a licence or a permit holder shall notify state and/or municipal authorities, international organisations and the general public of the intended or pursued activities in the manner prescribed by the Government or its authorised institution.

Article 16 of the Law on Nuclear Safety determines that full liability for the nuclear safety of a nuclear installation and for nuclear safety in carrying out other activities with nuclear and/or nuclear fuel cycle materials shall solely fall on persons that are engaged in such activities and hold relevant licences and/or permits. Type of licences and permits issued in accordance with Article 22 of the Law on Nuclear Safety are specified in Section 7.3.1.

The Law on Nuclear Energy of the Republic of Lithuania identifies the following responsibilities of a licence holder:

- The licence holder shall be responsible for the adequate and safe operation of the installation in accordance with the requirements stipulated in the laws and other legal acts, also in the articles of association, internal work rules of the licence holder and in the terms of the issued licence. The licence holder shall be responsible for safety of its activities and the nuclear installation.
- A nuclear installation shall be used only for the intended purpose as stipulated in its design. The purpose of nuclear installations may be changed in accordance with the procedure provided in the legal acts.

The licence holder shall:

- include into accounting the nuclear materials belonging to the nuclear installation or used in the operation and exercise their control in such a manner as to ensure performance of the obligations of the Republic of Lithuania regarding the guarantees of the IAEA and the European Atomic Energy Community (the EURATOM);
- investigate nuclear and/or radiological accidents and nuclear incidents in the manner prescribed by the laws and other legal acts;
- notify VATESI and other interested institutions in the manner prescribed by the laws

and other legal acts about all the violations of conditions and requirements for nuclear safety and all the malfunctions of the structures, systems and components ensuring safety of a nuclear installation, also shall notify promptly about a nuclear accident and/or radiological emergency, and shall inform of level of the accident estimated according to the International Nuclear and Radiological Event Scale (INES) and recommended actions for protection of the population;

- analyse and evaluate the risk of nuclear and/or radiological accidents in the nuclear installation to the population, their property and environment and shall prepare an emergency management plan as well as ensure preparedness to mitigate the consequences of a nuclear accident and/or radiological emergency in the nuclear installation;
- perform other duties established on the grounds of Law on Nuclear Energy and other laws.

In addition, Organisations operating nuclear installations and other holders of licences and/or permits, according to the national legal requirements shall:

- have the material, financial and human resources that are sufficient for involvement in the licensed activity or operations regulated by permits in compliance with the legal acts and technical standard documents of nuclear safety;
- ensure high level of safety culture and competence of the organisation and its workers;
- on a regular basis analyse the state of nuclear safety and improve it;
- consider human factors (human capabilities and their limits) at all stages of life of a nuclear installation;
- maintain an effective integrated management system with reasonable priority on nuclear safety;
- develop an organisational structure which would ensure the fulfilment of nuclear safety policy formation, implementation and control functions;
- ensure radiation protection of staff and population during normal operation, and for design basis and beyond design basis accidents in such manner as not to exceed the allowed levels of exposure for staff and population;
- implicitly follow the conditions of the licence;
- ensure quality of the licensed activity, proper management of documentation, its storage during all life-time of a nuclear installation, renewal in time and approval by licensing authority when it is necessary;
- be responsible for the safety of a nuclear installation even if the validity of the licence is suspended or it is revoked;
- monitor emissions of radionuclides into the environment in a systematic manner;
- monitor and investigate the contamination of a nuclear installation/site and environment in a systematic manner and present to the regulatory institutions with the data about emission of radionuclides, contamination of a nuclear installation/site and the environment;
- apply principles of “defence-in-depth” and the ALARA.

A licence holder is liable for the nuclear damage resulting from the activity subject to the licence or related to that activity to the natural and legal persons, their property or to the natural environment. The organization shall insure a nuclear installation or procure in some other way the funds necessary to compensate for the damage after a nuclear accident as assumed by the Republic of Lithuania according to the Vienna Convention on Civil Liability for Nuclear Damage.

At the request of VATESI, a licence holder shall submit the detailed information about the safety condition of the undertaken activity an (or) a nuclear facility pursuant to the procedure established by the Head of VATESI.

The analysis and justification of nuclear safety in the area of nuclear energy activities as well as other activities involving nuclear and/or nuclear fuel cycle materials shall be carried out by the licence holder. The results of the analysis and justification of nuclear safety shall be executed in the

documents justifying nuclear safety. The results of the analysis and justification of nuclear safety shall be independently verified in the manner set out by the Head of VATESI.

9.2. Description of the main means by which licence holder discharges the prime responsibility for safety

Since the final shutdown of both INPP units, the INPP goals are to safely and in an adequate manner implement the INPP decommissioning activities, nuclear and radioactive material and waste management, storage and disposal by effectively and consistently implementing the required measures, as well as reasonably and efficiently using the funds allocated for implementation of the INPP decommissioning and related measures.

The integrated management system based on processes (see Article 13) implemented at the INPP encompasses all organizational components (including its structure, resources, processes and safety culture) in order to set the goals and tasks for the enterprise and to enable to reach these goals and tasks which among others include: safety, quality, environment protection, worker safety and health, fire, radiation, physical protection, economic aspects and social responsibility. The main objective of the INPP management system is to ensure and improve safety during the decommissioning process in such a manner as other requirements laid down for the enterprise and (or) its needs would not be evaluated separately from the requirements for safety, as well as in order to avoid potential negative impact to safety.

In the statute of the INPP the following full responsibility is established:

- Compliance of the undertaken activity with the requirements of the Law on Nuclear Energy, Law on Nuclear Safety, Law on Radiation Protection, Law on Radioactive Waste Management and other laws and legal acts as well as licence conditions;
- Safe and adequate implementation of the INPP decommissioning and radioactive materials and waste management, storage and disposal in compliance with the requirements of the laws of the Republic of Lithuania, requirements of other legal acts regulating nuclear and radiation safety, licences conditions, the enterprise internal and access control order requirements;
- Nuclear accident prevention and elimination of such accident and its consequences;
- Nuclear damage caused during the INPP decommissioning or management, storage and disposal of radioactive waste.

Therefore, the INPP fulfils its responsibility for assurance of the safe operation of the NI through the following activities:

- has the appropriate organizational and management structures in place, ensures provision of necessary human, financial, material and technical recourses, development of internal norms and regulations to be followed, necessary scientific support, quality assurance throughout the entire INPP lifetime, ensures nuclear, radiation, physical, and fire protection, environment monitoring, recruitment and training of operational staff, safety culture, including continuous control of a NI safe operation;
- performs the activity indicated in a licence or permit in compliance with legal acts and the licence or permit conditions;
- carries full responsibility for the INPP safety and provides for measures preventing accidents and mitigating their consequences, performs accounting and control of nuclear and radioactive materials;
- ensures that the radiation impact to the staff, population and the environment during the normal operation, design basis accidents does not to exceed the set exposure levels of the staff and population, permissible norms of radionuclide release into the environment and its composition and limits this impact during beyond design basis accidents;
- ensures quality of the licensed activity, proper management of documentation, its storage throughout the entire lifetime of the INPP, timely renewal and approval by licensing authority

when necessary;

- consistently applies “defence-in-depth” and ALARA principles;
- implements the SIP measures;
- ensures continuous monitoring of all activities having impact on the safety. The results of safety inspections and periodic reports on the plant safety are submitted to the state control and regulatory authorities;
- carefully investigates unusual events at the INPP by commissions appointed in accordance with the norms and technical requirements in force and submits reports to VATESI and other interested organizations.

9.3. Description of the mechanism by which the regulatory body will ensure that the licence holder meets its primary responsibility for safety

VATESI is obliged to ensure the state regulation and supervision of nuclear safety and radiation protection at nuclear installations and other related organizations. According to the Law on Nuclear Safety of the Republic of Lithuania the main target of VATESI in the area of nuclear safety is to exercise the state regulation of, and supervise over the nuclear installations and the activities related to nuclear and nuclear fuel cycle materials, in order to protect the society and the environment against the harmful impact of exposure to ionising radiation. The main tasks of VATESI in the area of nuclear safety is development and regular improvement of the nuclear safety regulatory system, evaluation of safety of nuclear installations and the activities related to nuclear and nuclear fuel cycle materials, issuance of licences and permits, monitoring of the compliance with legal acts by conducting inspections, and if required – application of enforcement measures in the manner set forth by the legal acts of the Republic of Lithuania.

In performing the state regulatory and supervision functions of nuclear safety, VATESI shall:

- create and improve the state regulatory and supervision system for nuclear safety, radiation safety, physical protection of nuclear installations, nuclear and nuclear fuel cycle materials, as well as accounting and control of nuclear materials, approve the legal acts regulating such areas, including the area of nuclear safety regulation as per Article 4 of the Law on Nuclear Safety;
- analyse and assess the documents submitted by applicants for obtaining a licence or a permit, also the documents submitted by licence holders or permit holders or other persons, shall adopt relevant decisions regarding such documents, shall review and evaluate the nuclear safety;
- supervise and inspect applicants, licence and permit holders or the persons rendering services, supplying goods or performing works for them or other persons engaged in activities pertaining to nuclear materials and nuclear fuel cycle materials;
- monitor the compliance with the requirements set forth by the legal acts for activities in the area of nuclear energy subject to licences or permits and shall monitor exercising of the rights and obligations of licence holders and/or permit holders;
- monitor the compliance with requirements of the legal acts regulating nuclear safety, radiation protection in the area of nuclear energy, physical protection of nuclear installations, nuclear materials and nuclear fuel cycle materials, accounting for and control of the nuclear materials;
- apply enforcement measures in the manner set out by legal acts, require that relevant persons implement corrective remedies, eliminate the infringements, and shall monitor the implementation of such requirements;
- supervise the implementation of requirements arising out of the international obligations for non-proliferation of nuclear weapons assumed by the Republic of Lithuania;
- supervise the implementation of regulations safeguarding the structures, systems and components that are safety-critical to nuclear installations, and fire protection requirements.

Exercising the entrusted functions of state regulation and control of nuclear safety, VATESI has the right:

- to receive all information requisite for the review and evaluation of nuclear safety from persons, applicants and licence holders implementing the nuclear installation design, as well as from their service and goods providers, contractors or persons carrying out other activities related to nuclear and/or nuclear fuel cycle materials;
- in a manner prescribed by the laws and other legal acts receive all information and documents necessary for regulation and monitoring over the nuclear safety compliance with the requirements arising out of the obligations for non-proliferation of nuclear weapons and other international obligations assumed by the Republic of Lithuania from all the persons that possess such information;
- to coordinate actions with other state regulatory and/or municipal institutions, if it is required for the performance of the functions of the nuclear safety regulation;
- to obtain the services provided by experts and consultants, scientific-technical support organisations, other independent suppliers that are not related to the applicants, licence holders or persons involved in other activities related to nuclear and/or nuclear fuel cycle materials.

9.4. Description of the mechanisms whereby the licence holder maintains open and transparent communication with the public

The INPP, according to legislations of the Republic of Lithuania, as well as to inner documents of the enterprise, maintains communication and informs authorities, public and press, about its performance results, financial status and status of INPP nuclear safety. The enterprise prepares and distributes information about emergency through public information means to state institutions, local authorities, public, as well as by placing information on the INPP website www.iae.lt.

According to requirements BSR-1.8.1-2010 “Reporting on the unusual events at nuclear power plants” information about accidents is handed over to VATESI.

The enterprise issues information publications, prepares and distributes press releases, comments and information about current INPP`s activity, arranges meetings with local, state and foreign representatives of the mass media and on a regular basis renews INPP`s website www.iae.lt, where detailed information about enterprise’s activities main decommissioning projects, financing, radwaste management, activity rates, etc is presented.

The INPP organizes excursions and technical visits for visitors, representatives of the mass media, official delegations, etc., also arranges regional and international conferences and seminars for official representatives and experts concerning enterprise's activities.

Pursuant to the provisions of the Law on Environmental Impact Assessment of the Planned Economic Activity of the Republic of Lithuania and the Procedure for Notification and Participation of the General Public in the Environmental Impact Assessment Process of the Planned Economic Activity, the developed Environmental Impact Assessment Reports are also placed on the INPP external website for the notification and familiarisation of the general public. The reports themselves are available at the INPP Communication Division and the local Municipality for those wishing to read the reports. The affirmative decisions regarding the possibility to carry out the planned economic activity under consideration issued by the responsible institution are published on the INPP external website.

Based on the Nuclear safety requirements BSR-1.4.1-2010 „Management system‘s requirements“, the information prepared at the enterprise is relative to requirements of interested parties, in accordance with order for Receiving, Update and Usage of Information, which regulates receiving, arrangement and responsibility of usage of information, such as reasonable claims and responses of interested parties, concerning the INPP performance.

ARTICLE 10 SAFETY PRIORITY

Each Contracting Party shall take 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.

10.1. Overview of National Arrangements and Regulatory Requirements Regarding Policies and Programmes of Licence Holders to Prioritise Safety

Safety as the highest priority is emphasised within the Law on Nuclear Energy of the Republic of Lithuania and within the national system of regulation of nuclear safety. The first article of the Law identifies the main goal of state regulation in the field of nuclear energy – to ensure nuclear safety and preclude impermissible use and proliferation of nuclear materials and technologies.

According to the Law, the safety requirements and other legal documents the INPP established its policies, necessary structures, activities and integrated QM system based upon the priority on safety. The VATESI performs the regulatory activities to ensure constant adherence of the licence holders to the safety requirements and proper prioritization of safety.

The information presented within the sections bellow demonstrates implementation of safety priority in decisions and activities of the INPP and the VATESI.

Following Lithuania's legislation, the licence holder bears full responsibility to ensure the safety. The Law on Nuclear Safety of the Republic of Lithuania determines the basic principles for ensuring nuclear safety as follows:

- The full liability for ensuring nuclear safety shall fall on the persons in charge of the nuclear installation or the activities posing a risk of exposure to ionising radiation;
- Safety assurance shall require the development and maintenance of an effective legal framework and a public management structure involving both an independent state regulation of the activity in the area of nuclear energy, other activities dealing with nuclear and nuclear fuel cycle materials and the institution exercising control over the same;
- Effective administration and management with the view to secure safety shall be created and maintained by all persons related to the activities of nuclear installations and the use of nuclear and nuclear fuel cycle materials as well as other operations. The highest priority in the management system of such persons shall be the assurance of nuclear safety. Allocation of resources for ensuring safety shall be differentiated according to the issue's at hand impact on safety;
- The economic, social and other benefits carried by a nuclear installation or other activities related to acquisition, possession, operation or shipment of nuclear and/or nuclear fuel cycle materials shall objectively exceed the possible operational risks;
- Employment of such measures for ensuring nuclear safety which would allow to reach the highest, rationally possible, level of nuclear safety, however there should be no requirements which could unreasonably prevent a nuclear installation from operation or from performance of other activities related to acquisition, possession, operation or shipment of nuclear and/or nuclear fuel cycle materials;
- The nuclear safety measures shall secure the lowest possible risk of exposing ionising radiation to any human being and thereby suffering damage. The impact of exposure to ionising radiation shall be as low as possible and shall not exceed the dose limits set by the laws and legal acts of the Republic of Lithuania;
- The present and future population and environment shall be protected against the harmful impact of exposure to ionising radiation;
- Application of all rationally practicable measures preventing nuclear and radiological accidents and mitigating their consequences, if any;

- Measures that would secure preparedness and emergency response procedures in the event of nuclear and radiological accidents as well as in other situations posing radiation danger shall be applied;
- The reasonable and optimised measures of protection against the impact of exposure to natural or man-made unregulated ionising radiation shall be applied.

With an aim to meet the requirements of the IAEA standards and the recommendations on the levels of the reactor's safety areas set by the WENRA for the advanced management systems of the nuclear facilities and activities, as well as with regard to the contemporary best practice, the nuclear safety requirements BSR-1.4.1-2010 Requirements for the Management System were prepared and issued in 2010. This document provides requirements on process oriented management system. Also it requires that qualification of all managers and other employees of a licence holder involved in safety-related activities have to be assessed and periodically re-examined regarding understanding of their work and the manner and degree in which their activities affect safety. The employees should be fully aware of the consequences, which might follow the violation of rules or any deficient application of the prevailing norms and technical requirements. The licence holder must ensure necessary financial, material, human and technical resources are in place as well as administration rules and technical requirements, scientific support and effective QM in the all stages of lifetime of a nuclear installation, physical protection, the fire protection of its nuclear installations and maintaining safety culture and continuous monitoring of safety. The arrangements for implementation of licence holder's responsibility for safety are explained within Article 9 of this report.

According to the Law on Nuclear Safety of the Republic of Lithuania Organisations operating nuclear installations and other holders of licences and/or permits must ensure high level of safety culture of the organisation and its workers. Basic principles for development of safety culture are stated in BSR-1.4.1-2010. Also the Regulations for issuing licenses and permits for nuclear power facilities and activities requires the VATESI to assess programme of means for safety culture development prior to issue a licence or permit.

The VATESI safety policy is stated within the VATESI Mission: "Taking into account risk of nuclear energy use as well as wish of the society to avoid nuclear and radiological accidents and incidents, and understanding its responsibility for society of Lithuania and worldwide, the VATESI performs regulation and state oversight of nuclear and radiation safety at nuclear installations with the aim to protect the society and the environment against harmful impact of nuclear and radiological events and accidents."

10.1.1. Safety Policies

In accordance with international practice and with the Article 3 of the Law on Nuclear Safety of the Republic of Lithuania, the INPP, being the operating organization, undertakes fully responsibility for safety assurance of the nuclear facility and establishes policy that gives the top priority to the plant safety. The policy also applies to the decommissioning process and demonstrates INPP commitment to the safe and effective decommissioning.

VAE – a project of new nuclear power plant developing company – was established on the 28 of August, 2008 and continued implementing preparatory works of VNPP construction project which were carried by Nuclear energy department of "Lietuvos Energija" AB.

VAE is developing and improving its own competence in safety and seeks external competences in the safety related aspects of activities of the organization. All the sites studies and assessments, including EIA and potential site evaluation are done in accordance with national requirements, international practice and in line with the relevant IAEA safety standards.

Regardless VAE is not a license holder and not even an applicant for obtaining a license for activities in the field of nuclear energy yet, this organization recognizes the safety as a top priority for both on-going and planned future activities the company. For that purpose a safety policy in the company has been developed.

The Management of the VAE considers safety to be the most important part of the activities of the VAE and undertakes to ensure adequate execution of safety functions. The general goals of safety are as follows:

- understanding of the main aspects of the safety culture in the activities of the VAE, its contractors, and sub-contractors;
- timely provision of employees with resources and means necessary for safe and successful work;
- systematic and consistent development and assessment of the safety culture;
- environmental protection and preservation.

The Management of the VAE understands safety as a system of the specific features of the organisation and its employees, knowledge about possible consequences of the activities and provisions (including values) of importance for safety as well as relevant practice, which preconditions proper and comprehensive attention of all employees to safety including but not limited to the following: observance of the effective safety rules, work with certified tools and equipment, fostering of safe work culture, and escalation of safety issues to the Management of the VAE.

The Management of the VAE undertakes the following obligations:

- to perform activities in a safe manner and to follow the established requirements;
- to give preference to safety over other priorities or goals;
- constantly improve safety and develop the safety culture;
- establish measures which allow proper execution of safety supervision.

10.1.2. Safety Culture and Its Development

Activities on safety culture development are performed in the INPP in order to increase constantly nuclear safety by means of improvement of management and personnel attitude to safety, what provides safe and correct execution of works and creation of atmosphere of openness and mutual respect.

According to Article 17 of the Law on Nuclear Energy of the Republic of Lithuania, the following requirement is set forth: organization granted with the license on the NPP operation must guarantee to the regulating authority the high level of safety culture in the organization. Similar requirement is defined also in conditions of the VATESI issued operating licenses for Unit 1 and 2.

The VATESI devotes specific attention to the safety culture issues. In 2010 VATESI issued the nuclear safety requirements BSR-1.4.1-2010 to the management system of the organisations, which have activities related to nuclear energy in the Republic of Lithuania. This document provides special requirements for management of safety culture.

Safety Culture Management Procedure and Procedure for collection and processing of data required for calculation of safety culture indicators were reviewed and implemented at the INPP within the frames of IMS.

Director General of the INPP annually approves Plan of activities on safety culture development at the INPP, where the specific measures on implementation of the INPP`s safety culture development Programme are determined. The main objective of the Programme is to orientate behaviour of personnel of the plant and contractors, also plant management methods to the achievement of the highest priority – safety.

Priority tasks on safety culture improvement at the INPP:

- the Safety Policy shall obtain support of the plant management and a commitment to this Policy shall be demonstrated;
- safety culture shall become the key element of the plant activity management;
- to improve attitude of the plant employees to their work, to improve mentality and inner critical position of the plant personnel, which would prevent negligence, develop self-regulation

with regard to the safety matters;

- to provide the plant personnel with open and effective information about all works performed at the INPP in order to ensure understating of the common tasks and plant operation perspectives by each employee of the INPP, as well as to inform the plant personnel about activities related to the decommissioning of both Units;
- training of personnel on the safety culture principles using the examples of good practice, operational experience in order to learn lessons;
- performance of safety culture audits with further corrective actions and improvements.

At the INPP monthly meetings are held on the initiative of the Director General and in light of the suggestions provided by the representatives of the plant personnel. The aim of these meetings is to exchange information about the status of the current affairs at the plant, to discuss the important safety and organizational issues.

10.1.3. Arrangements for Safety Management

The INPP`s approach towards nuclear safety is based upon the principle of "defence-in-depth", i.e. by the sequential implementation of protection measures based on a system of barriers to prevent the spread of ionizing radiation and radioactive materials to the environment and a system of technical and organizational measures to protect these barriers and retain their effectiveness, and to provide direct protection for the population.

To ensure safety in continuous and reliable way and to implement nuclear safety requirements the INPP has implemented QM system (see Article 13) and identified safety requirements to be followed in all activities of the INPP, established the necessary organizational structure and performs internal safety oversight activities, including independent assessments.

Safety related activities at the INPP are planned in advance. Precautionary measures for routine jobs are included in work instructions.

An independent audit and review system is established to monitor and evaluate safety performance. Corrective actions are reviewed are assessed prior and after their implementation whether they adequately address the issues identified during audits and reviews. A number of peer reviews (ASSET, OSART and WANO) have been conducted in the past to provide an independent judgment on the effectiveness of the safety management system.

The configuration management program is established and implemented at the plant. A program controls plant modifications, including those of a temporary nature. The actual number of outstanding temporary modifications is small.

A program for ageing management is in place. The physical degradation phenomena, including degradation caused by the various activities of operation, surveillance and maintenance, are analyzed.

Root Cause Analysis is performed for the events reported. Event evaluation reports have to be completed within one month after the event.

10.1.4. Arrangements for Safety Monitoring and Self-Assessment

INPP as an operating organization ensures continuous monitoring and supervision of all activities related to the plant safety. For self-assessment the INPP has developed and applies 2nd level QM procedure “Self-Assessment” MS-2-001-5. According to this procedure, the INPP self-assessment activities are carried out by the INPP administration management, Managers of directorates and services and Managers of other divisions. The procedure also defines, that self-assessment is performed by the following means:

- safety inspections and audits are performed by the INPP AS&QMD and a responsible manager participates in decisions on what improvement actions are needed;
- checking whether work areas, buildings and rooms are in proper conditions;
- collecting information on activities and their results;
- daily communication of managers with personnel and observations of their work;

- analysis of the INPP staff suggestions on improvement;
- investigations of unusual events and identification of their root causes;
- meetings to review performance indicators (including those corresponding to targets set for a particular division) and follow-up on improvement activities.

The procedure identifies periodic meetings at the INPP to review performance (including safety performance) – quarterly management meetings and management meetings at the INPP directorates and services and monthly meetings at other INPP divisions.

Annual schedules of self-assessment activities at the INPP contain information about:

- safety inspections and internal QM audits;
- checks of employees' safety and health, other specific checks;
- planned dates for submitting reports on employees' safety and health;
- planned checks of work areas to be performed by managers.

From December 2006 the INPP applies a special procedure for determining and evaluating safety performance indicators (SPI). Calculations of SPI are performed monthly. The reports are submitted to management of the INPP and to the VATESI.

10.1.5. Independent Safety Assessment

All documentation submitted for VATESI approval is the subject of independent safety assessment by the INPP AS&QMD. This department reports directly to the INPP Director General and is responsible for independent safety assessments, safety inspections, assessments of modifications and QM audits.

The INPP Safety Committee performs additional independent assessment of safety important decisions and gives advices directly to the management of the INPP, e.g. on safety important modifications, on the INPP personnel motivation policy.

10.1.5. A Process Oriented (Quality) Management System

See Section 13.3.

10.2. Measures taken by licence holder to implement arrangements for the priority of safety

During the last three years the following measures were foreseen and implemented:

Training of the personnel

The matters of safety culture concept, matters of the own and industrial experience and examples from practice of performance of works related to safety culture were included into the training process.

The specific work was performed concerning the conduction of the safety culture seminars for plant employees. In order to conduct the seminars the monthly schedules were developed, coordinators for each plant department were appointed and special training tools were used.

During these seminars the problems in the safety culture area and their possible solutions were discussed. The participants of the seminars reviewed the reports on events at the INPP related to the disadvantages of safety culture.

Updated version of the Safety Culture Training Manual was issued in 2012.

Participation and input of the personnel in safety improvement

Guidelines on work with proposals on improvement was developed and implemented. In

accordance with these guidelines employees of the INPP have an opportunity to submit their proposals to the divisions' managers. For this purpose there are special logs for submission of proposals in the plant divisions and post boxes with proposals-forms for submission of proposal to the Director General and managers of the directorates and services. These boxes are equipped at the plant checkpoint and in changing-rooms. Besides, there is an opportunity to give proposals directly to the Director General through internal website.

Posters “Examples of good standards” at the INPP have been prepared and distributed to workplaces.

Independent reviews, inspections and audits

Audit of the implementation process of management procedure MS-001-4 “Safety culture management procedure” was performed in October 2012. The purpose of the audit was to assess the implementation of management procedure, which was reviewed and issued on 2011. Recommendations were issued for the safety culture assessment results presenting to the plant personnel and for the plant personnel training programs.

A separate procedure for determining and evaluating of safety indicators was developed in 2004, when both units of the INPP were in operation. The assessment of safety indicators by this procedure was applied until the end of 2010, when the INPP entered into a decommissioning stage. The work of the INPP specialists on developing procedure for determining and evaluating of safety indicators of the INPP, which is on decommissioning stage, was ended on December 2012. The INPP calculation of safety indicators perform every quarter and represent them in the report. The reports are submitted to the VATESI and managers of the INPP departments.

Motivation of personnel

Director General of the INPP developed policy in the area of personnel motivation. Adhering to the INPP policy in the field of safety and quality assurance, the INPP management under the leadership of Director General declares:

- We have to motivate the personnel for good work, for making the contribution to the plant safety improvement. The tendency to note well performed work has to become a priority element of management. The work is considered to be well executed, when it is executed safely and to high quality level.
- Every manager has to create an atmosphere of such kind when the personnel avow problems and own errors. The personnel mistakes are considered only as a possibility to refrain from their repetition, not with the purpose to impose a penalty. It is necessary to learn lessons from each error and thereby to help itself and others not to make this error again.
- However, we must be intolerant to violation of safety, of internal regulations and hiding of errors. Moreover, we have to make a decision on each penalty recovery applying weighted approach in order not to impair atmosphere of openness. The INPP management declares its adherence to the Policy in the field of personnel motivation.

External and Internal information

The IMS procedure "External and Internal information" was reviewed and approved in March 2012. Activity on external and internal information is performed in order to timely inform the plant personnel, public, mass media and state institutions by means of preparation and transmission of information about the INPP. Information about the INPP condition, information about implementation of important projects, information about organizational changes at the INPP including those related to the decommissioning process of the INPP`s units is presented by Communication Department personnel placing the constantly updated information at the website www.iae.lt.

Analysis of the root causes of events

Procedure for additional analysis of events caused by the incorrect personnel actions during unusual events was reviewed in 2010.

Analysis of the root causes considering influence of the human factor to safety is performed in order to increase level of safety and reliability of the INPP. Analysis of the events related to the human factor provides prevention of events in future by means of detection of root causes of the events, development and realization of corrective measures intended to eliminate causes and prevent new events.

Assessment of safety culture

Assessment method is based on the interview sheets – questionnaires which were developed considering the safety culture features which are applied in world nuclear power production industry. The results of safety culture assessment were developed on the basis of information presented in questionnaires which were filled by key personnel of the INPP. The next assessment of safety culture by using questionnaires is planned for the end of 2013.

Since 2004 the INPP has performed activities related to identification and application of safety culture indicators. These indicators are necessary for in-depth assessment of the safety culture within the enterprise and timely prevention of latent weaknesses in the area of operational safety, human behaviour and organizational structure, as well as in cases of appearance of positive trends within the organization. In 2004 a procedure for collection and processing of data required for measurement of safety culture indicators was approved. At the beginning of 2010 additional information has been added to the procedure based on the gained experience and situation at the INPP. Results of calculation of safety culture indicators are registered quarterly. These results are presented in reports, which are submitted to the INPP departments and to the VATESI. Numerical values of safety culture indicators are presented on the INPP internal web-site for notification of all employees.

10.3. Regulatory process of monitoring and oversight of arrangements used by the licence holder to prioritize safety

The VATESI performs safety review and assessment activities as well as implements inspection programme to define if safety level of nuclear power corresponds to requirements. When needed, the VATESI uses assistance of TSO for independent safety verification. The VATESI requires from the INPP to present approved results of independent assessments of submittals for licensing, permits, modifications and other safety important decisions.

The VATESI continuously monitors safety culture of the INPP by the following activities:

- inspections and other activities to assess licensees' compliance with requirements of the granted licence and other requirements;
- reviewing quarterly safety culture related reports on INPP safety culture indicators and organizational issues related to safety culture;
- review of results of the surveys for assessing safety culture at the INPP;
- performing review and assessment of the INPP submittals (e.g. on safety important changes to the INPP organizational structure);
- quarterly and other meetings with INPP management.

The safety assessment at the VATESI is performed according to the 2nd level VATESI QM procedure KU-II-01. The procedure identifies requirements and responsibilities in the following steps of the safety assessment process:

- reception of submittals and assigning responsibilities;
- preliminary review, identification of relevant requirements and evaluation of needs to

contract competent TSOs (also signing contracts in case such TSOs are needed);

- review submittals and documentation of results and the related communication, including development of safety assessment conclusions;
- decision regarding assessment results;
- drawing lessons from the gained experience and identifying measures to improve activities of the VATESI.

In the case if the VATESI decides to use support from a competent TSO, the experts are carefully selected regarding their competence and independency from the INPP. The VATESI does not use services of the TSO experts who have participated on the side of a licensee regarding the issue in question.

10.4. Means used by Regulatory body to prioritize safety in its own activities

Safety as the highest priority is emphasised within VATESI Mission, QM documents, strategic and annual plans of the VATESI activities and nuclear safety requirements. The main goal of the VATESI strategy is to assure high level of nuclear safety. The VATESI has established and continuously improves system of nuclear safety requirements. Monitoring and evaluation of both VATESI and licensees activities and performance emphasise the priority of safety. The VATESI constantly performs the regulatory activities to ensure constant adherence to the safety requirements and proper prioritization of safety.

Safety oversight is performed on the basis of specific and clearly defined requirements. Every VATESI employee must perform his (her) duties with responsibility, using his (her) professional knowledge and experience, enhancing his (her) qualification and sharing the knowledge with the colleagues.

The VATESI seeks constructive dialogue and cooperation with other institutions and bases its activities on the gained experience and international practice. The VATESI management system is integrated into the everyday work and ensures that the employees receive the necessary information, assistance and tools to perform their tasks properly. Heads of the divisions are responsible for the quality of work performed and services provided by their divisions. Each employee is responsible for the quality of work performed by him (her). Activities of the VATESI are based upon principals of honesty, openness and clarity. The VATESI provides reliable and correct information on nuclear safety in Lithuania to the public in timely and proactive manner.

Corporative VATESI activities and those of individual employees are subject of continuous improvement which is based on the self-assessment.

The self-assessment of the VATESI is integrated in different processes and activities:

- self assessment within VATESI strategic planning process;
- self assessment within separate processes (licensing, safety assessment, inspections, etc.), performed by the responsible specialist for the timely update of it;
- specific assessments before and during preparation of new legal acts;
- specific assessments before major organizational changes;
- review of activities as a part of preparation for state audit, the IAEA missions, etc.;
- preparation of annual VATESI activity report for the Government;
- annual evaluation of state servants;
- weekly meetings of the VATESI management organized in the morning of each Thursday;
- annual meetings of the VATESI staff with the aim to review and assess VATESI activities of the past year.

The VATESI strategic plan is prepared each year based on the approved requirements, methodology and priorities of the Lithuanian Government, taking into account and including the Environmental analysis consisting of analysis of external factors, analysis of resources and SWOT

analysis.

The analysis of external factors, performed within the strategic planning, covers analysis of political factors, economical factors, social factors and technological factors.

Analysis of resources, performed within the strategic planning, covers analysis of the:

- Legal basis;
- Organizational structure;
- Human resources;
- IT and telecommunication system;
- System of planning;
- Financial resources;
- System of accountancy;
- Internal control system.

The achievements of the VATESI activities in correspondence with the Strategic plan have to be evaluated each year. The evaluation criterion of “Strategic aim” is Effect, the evaluation criterion of “Aim of the programme” is Result and the evaluation criterion of each “Task” is Product. All evaluation criteria are measurable. Each year VATESI provide report to the Government, prepared based on the commitments foreseen in the Strategic plan. Evaluation of the results is an essential part of this report. Results of VATESI activities are reflected within internal weekly and quarterly internal reports, and also in VATESI annual reports available on www.vatesi.lt.

ARTICLE 11 FINANCIAL AND HUMAN RESOURCES

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.

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. Article 11(1) – Financial resources

11.1.1.Mechanism for the provision of financial resources to the license holder or applicant in order to ensure the safety of the nuclear installation throughout its lifetime

During 2007 – 2009 the operation of Unit 1 was financed in the frame of the Ignalina Programme from the funds of the European Union and the National Fund.

After final shutdown of the INPP in December 2009 up to present, the following parties take part in financing of the INPP maintenance and decommissioning:

- European Community under the Ignalina Programme (IP);
- INPP Decommissioning Fund (DF);
- INPP own means (INPP);
- Ignalina International Decommissioning Support Fund (IIDSF);
- Lithuanian Republic budget (LR).

Annual planned and actual INPP expenses financed from the sources above are shown in the Table 11.1 and 11.2. It was planned that about 80% of total annual decommissioning expenses would be covered by European funds, the rest – by Lithuanian ones. Actual state of affairs can be seen from the Table 11.3.

Table 11.1

Source	2010		2011		2012		2013
	Plan (Ths Lt)	Fact (Ths Lt)	Plan (Ths Lt)	Fact (Ths Lt)	Plan (Ths Lt)	Fact (Ths Lt)	Plan (Ths Lt)
IP	235299	196710	269209	161607	221273	167384	219913
DF	61148	42398	27595	23557	30943	25738	30008
INPP	0,00	8588	39220	20822	12981	6704	15526
IIDSF	157682	98631	311093	91332	239091	42111	293911
LR	31750	30730	26292	21466	24131	21453	28473
Total	**485879**	**377057**	**673409**	**318784**	**528418**	**263390**	**587831**

Table 11.2

Expense item	2010		2011		2012		2013
	Plan (Ths Lt)	Fact (Ths Lt)	Plan (Ths Lt)	Fact (Ths Lt)	Plan (Ths Lt)	Fact (Ths Lt)	Plan (Ths Lt)
Working expenses	138016	126469	129251	115762	127268	117059	128289
Utilities	87287	68003	87432	63118	66291	63074	72738
General expenses	3502	1663	2103	1359	1658	1332	1411
Works & Services	37007	42915	79951	41122	65594	37713	52797
Equipment & Supplies	18125	5082	23335	5666	31494	9984	28738
Taxes	10988	10287	445	255	967	214	3747
Decommissioning projects	190954	122638	350892	91502	235147	34013	300112
Total	**485879**	**377057**	**673409**	**318784**	**528418**	**263390**	**587831**

Table 11.3

Source	2010		2011		2012		2013
	Plan (%)	Fact (%)	Plan (%)	Fact (%)	Plan (%)	Fact (%)	Plan (%)
European funds	81	78	86	79	87	80	87
Lithuanian funds	19	22	14	21	13	20	13

Financing Model for new Visaginas NPP

The VAE is not a licence holder but this organization is responsible for project preparatory works that are necessary in order to have proper arrangements, after the establishment of project implementing company, to develop new VNPP construction project. The VAE is state-owned company and the Ministry of Finance holds 100% shares of it. The VAE is also the parent company of a power company group including electricity generation company Lietuvos energija, AB and distribution network operator LESTO, AB.

Project Company (PCO), once established, will coordinate, supervise and inspect the carrying out of the Project and construction of the VNPP. Once the VNPP will be commissioned the PCO will operate the installation.

The VNPP project participants are: Lithuania, regional partners – Latvia and Estonia, and the Strategic Investor – the Japanese company Hitachi together with Hitachi-GE Nuclear Energy as technology provider. According to the Lithuanian legal requirements, Lithuania will have no less than 34% of the VNPP shares. The VAE will be national "Lithuanian Investor" to the new NPP construction project and will take presumably 38% of PCO shares. The remaining shares will be distributed among other participants of the project. The VNPP project is being developed based on the Mancala model. According to the model, the investors in the VNPP will get electricity at cost price in proportion to the amount of shares they have.

It is envisaged that the investment costs would be funded by shareholder equity or through third party debt, secured by the shareholders. In the case of Lithuania a small proportion of the total investment cost is already identified as funded via the contribution in kind of the site and already completed development activities. The financing plan is based on conservative assumptions on scope of debt financing. Each of the shareholders would commit to fund the full investment requirement under their shareholding obligations even at a zero debt basis. The proportions of funding to be provided from different sources are yet to be finalized (i.e. whether funded at corporate level or using the shareholder secured financing). The VNPP construction project will be financed by export credit agencies: JBIC, US ExIm and NEXI backed commercial bank loans. It is also planned that the investors will formally apply to obtain debt funding both from the European Commission under EURATOM and from the EIB. Several debt financing options are being considered, including lending enabling prospective shareholders to receive ECA financing at the shareholder level then passed on further to PCO to finance the Project. Based on the letters of interest from the export credit agencies and other financing sources, a maximum leverage level of up to 70% of the overall required investment in the project would be possible.

Securing Finances for VNPP Decommissioning

Lithuanian Law on Nuclear Energy requires that operator of the nuclear installation shall ensure accumulation of the resources in the fund for decommissioning of the nuclear installation (the Decommissioning fund) required for safe decommissioning of the nuclear installation and management of radioactive waste. The operator of the nuclear installation shall be entitled to secure its obligations related to financing of the safe decommissioning and management of radioactive waste by furnishing to the Government or its authorised institution a guarantee in the prescribed amount. The procedure for establishing the guarantee and the terms for its delivery, the time limits of the guarantee, the amount of the guarantee and other mandatory requirements shall be regulated by the law on the decommissioning fund or the legal acts implementing the law on the decommissioning

fund.

The principal objective of the decommissioning fund shall be accumulation of resources required for safe decommissioning of a nuclear installation and safe management of radioactive waste, including spent nuclear fuel. The decommissioning fund (or funds) shall be established by a law. The law on the decommissioning fund shall inter alia set forth:

- sources for accumulation of the fund resources;
- tasks for which the resources are accumulated;
- principles of management and control applied to accumulation and use of the resources;
- principles for using the resources before beginning the decommissioning of the nuclear installation without prejudice to the principal objective of the decommissioning fund;
- measures for continuity of accumulation of resources in the event the nuclear installation is decommissioned due to unforeseen circumstances.

The resources of the decommissioning fund may be used only for implementation of the measures and the tasks for which the resources were accumulated based on their intended purpose.

The law on the decommissioning fund and corresponding legal acts are yet to be adopted; draft of these acts is based on Comparison among Different Decommissioning Funds Methodologies for Nuclear Installations, study made by Wuppertal Institute on behalf of the European Commission Directorate-General Energy and Transport, and is compliant with the Commission Recommendation on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste (2006/851/EURATOM).

Lithuanian legislation requires Preliminary Decommissioning Plan together with application for nuclear facility construction license to be prepared and submitted to the VATESI. The purposes of the plan are accumulation of sufficient funds for safe decommissioning of the nuclear facility, early as possible planning of the measures facilitating the decommissioning and gather all information important for the decommissioning.

11.1.2. Statement with Regard to Adequacy of Financial Provisions

Lithuania ensures the sufficient financial provisions to ensure safety and activities of the INPP and the VNPP.

11.1.3. Processes to Assess Financial Provisions

Ministry of Energy executes control over financing of the INPP, assigns an independent auditor to review financial documentation of the INPP, and approves financial results of the INPP.

Director General of the INPP is responsible for safety and activities of the INPP and implements decisions regarding activities of the INPP and its decommissioning taken by the Parliament (Seimas), the Government, Ministry of Energy and Management Board, formed by Ministry of Energy.

11.2. Article 11(2) – Human resources

11.2.1. Overview of the arrangements and regulatory requirements concerning staffing, qualification, training and retraining of staff for nuclear installations

INPP has a quantitatively high number of personnel in comparison with the other NPP`s in the world (except for the former Soviet plants). Firstly, operation and maintenance of INPP demands a lot of efforts and manpower resources.

Many INPP experts have undergone training at the nuclear power plants of Sweden, USA, Canada, Japan and other countries. Such training provides efficient tool to adopt the safety improvement experience.

Since 1 January 2010 the main activity of INPP is decommissioning. Today many employees employed in the enterprise have a huge experience, unique knowledge that shall be maintained and applied. While implementing the decommissioning projects the knowledge and experience of these employees are applied at most. The procedures, manuals and guidelines in the field of personnel management are developed in accordance with the IAEA standards.

As of 1 January 2013 the INPP personnel is well educated and properly trained (total – 2053):

- 43% of personnel have higher education (883 employees);
- 21% - specialized secondary education (431 employee);
- 36% - vocational schools (419 employees); general secondary education (306 employees) and unfinished general secondary education (14 employees).

In 1992 5788 employees were employed at INPP. By 1 January 2001 the quantity decreased to 4680, and by 2004 – to 3642. Later the quantity of employees continued to decrease and by 1 April 2007 made up 3230. As of 1 January 2008 3145 employees were employed at INPP and as of 1 January 2009 – 2995 employees. After shutdown of Unit 2 at the end of 2009 the quantity of employees made up 2354 (as of 1 January 2010). As of 1 January 2011 the workforce at INPP was 1966.

Due to the intention of the INPP management to implement as many projects as possible using internal manpower of the enterprise, and taking into account qualification of the INPP personnel and the performed works on equipment dismantling and decontamination, it was decided to refuse the services of external organizations and to perform as many works as possible by the INPP own resources. Due to this fact at the beginning of 2011 the amount of employees working at INPP started to rise. As of 1 January 2013 the amount of employees was 2053. In order to realize some short-term projects, employees are hired under the fixed-term employment contracts.

11.2.2. Methods used for the analysis of competence requirements and training needs for all safety related activities in nuclear installations

By means of the enterprise structure optimization and improvement of relationship between structural divisions, on 1 November 2012 INPP passed on the new organisational structure. It was the first stage of large-scale reorganization of the INPP organisational structure. The second stage of reorganization is planned in 2013-2014. At the beginning of 2013, independent experts started evaluation of workplaces/positions and formation of the new system of payment for labour. Moreover, in March 2013 the evaluation of workload of the INPP general activity started.

The activity related to the management of personnel at INPP is regulated in accordance with the Personnel Management Procedure Description QA-2-14 and is performed with due regard for the following criteria:

- Qualifications required for the personnel ensuring the nuclear facility safety, are established by the operating organization and agreed with the VATESI.
- The personnel arrangements comply with aims and tasks of INPP for the current period and, if necessary, organizational changes are performed.
- Recruiting and personnel training ensure the sufficient quantity of the personnel for safe operation, maintenance and safe implementation of decommissioning projects. Personnel state of health and their medical and psychophysical characteristics comply with the functions performed.
- Primary training provides the personnel with sufficient knowledge and skills to perform due tasks and to understand consequences of their activities with respect to safety.
- Personnel certification makes it certain that the plant personnel have enough qualification to fulfil its duties in order to provide safe decommissioning of the nuclear facility.
- The work with the personnel is planned and systematically conducted taking into consideration primary and continuous training and certification of the personnel.
- To maintain the necessary knowledge the personnel have periodical briefings.
- The personnel providing safe operation of equipment shall have periodic training on

simulators and other technical means, undergo emergency preparedness and fire preparedness training and passes periodic assessment of their psychophysical state.

- The training is conducted in accordance with written and approved procedures. The procedures are systematically revised with consideration of operational experience, implemented equipment modifications, decommissioning projects and experience of other NPPs. The training process is planned and monitored and the results are recorded.
- The training programs contain objectives to be achieved as well as types, methods and subject area of training including the safety culture.
- The maintenance personnel shall have general training as for all INPP personnel, know general parameters and functions of the systems they work with, and also be aware of safety and quality assurance aspects as well as quality control issues.
- The personnel involved in decommissioning projects is trained for decommissioning projects management, techniques of safe dismantling, decontamination and radioactive waste management.
- The managers are experts in their area who have basic training and obtain required knowledge and experience in nuclear energy, maintain and improve qualification at the enterprise and other educational institutions.
- The personnel related to safety are periodically certified.
- Instructors who work in the training department shall have enough qualifications to provide training and sufficient competence of the trainees. They are aware of and can provide basic training. They are chosen among the experienced personnel of the enterprise. Instructors are technically competent and have sufficient authority for conduction of training.
- The personnel ensuring safety of the nuclear facility gets an access to the unsupervised work after the primary training and certification. The operating personnel undergo additional in-depth training at the workplace under the guidance of an experienced employee.
- Conduction of production meetings, walk-round checks of workplaces by supervisors, inspections and audits in the field of personnel management are carried out systematically.

11.2.3. Arrangements for initial training and retraining of operations staff, including simulator training

Till 2007 the Kaunas University of Technology according to the agreement was preparing specialists in the field of nuclear energy for work at INPP. The training was conducted in the Kaunas University of Technology as well as in the Obninsk Institute for Nuclear Power Engineering. At the present moment specialists for INPP are not being prepared. Purpose of the initial training is to prepare employee for a position at INPP, including the training for promotion.

In INPP initial training is conducted in the following sequence:

- After the corresponding procedures are performed in Personnel Department the employee’s manager shall perform the primary on-the-job instructing of the employee;
- Training Subdivision (TS) instructors determine the knowledge level and skills of a trainee by interview or written test in the presence of the trainee’s manager;
- On the basis of the results and in accordance with the approved general training programme for a position, TS develops the individual training programme for the specific employee;
- Upon passing all training stages in accordance with the individual programme the employee shall take internal exam at the TS or at his shift (for operation personnel);
- In case of the positive result of the internal exam the employee shall go through position qualification approval procedure.

After the initial training is completed the employee on the basis of the qualification committee conclusion is allowed to work under supervision of the experienced employee (for operation personnel) and/or independent work.

Training of the personnel consists of the theoretical training and on-the-job training (probation).

Number of the theoretical training items and their contents is specified in accordance with the specific activities performed at INPP. Theoretical training of the personnel can be performed in form of courses or individually by the TS instructors or the relevant experts of the INPP departments.

Training on the full-scope simulator or other technical means (training computer programmes, equipment mock-ups, actual components and samples, etc.) is provided when required by a training programme and is conducted by the TS instructor.

On-the-job training (probation) is to acquire practical skills and attitudes in situ and is conducted by the on-the-job instructor. During probation period employees study and apply in their work areas the actual rules, required standards, job descriptions and operation manuals in accordance to obtain experience for proper, safe and effective work. At the end of the on-the-job training (probation) and before the qualification by the appropriate qualification committee the employee's practical skills are checked.

The purpose of continuing training is to maintain and further improve knowledge, skills and attitudes. Job proficiency maintenance training includes:

- Training in TS or in other training institutions;
- Periodic instructions;
- Studying of industry and in-house experience;
- Qualification in the form of periodic knowledge check-up and re-qualification;
- Performance of required practical exercises and drills (emergency and fire protection training, full-scope simulator training);
- Studying of modifications.

Qualification improvement includes:

- Qualification and enhancing of professional competence level via special courses at TS or other organizations in Lithuanian and abroad;
- Experience exchange activities implemented in co-operation with other NPPs.

During continuing training the Main Control Room (MCR) staff solves the follow main tasks:

- Maintaining of the basic knowledge scope at the proper level;
- MCR staff training with respect to the diagnostics skills and emergency situation mitigation;
- Complex training on the basis of modifications performed;
- Training of organisational and managerial skills;
- Training of operative work skills;
- Improvement of team work methods.

Within the frames of personnel continuing training the annual sessions are arranged with lectures, seminars and practical exercises on the full-scope simulator for MCR operators. Each lesson is analyzed upon its completion to:

- Solidify the skills acquired;
- Indicate good achievements throughout the exercise task performance;
- Reach thorough understanding of technological process dynamics;
- Work out ability of situation analysis;
- Work out skills of teamwork.

To improve skills on the MCR operators in the accident management training programmes, the following circumstances are simulated for the trainees:

- Time constraints;
- Sudden increase of information flow in case of accident;
- Possible stress of operator,
- Lack of operational experience in accident conditions;
- Hidden failures of safety important and other systems.

Continuous training for the maintenance personnel includes:

- General and special preparation requirements for a particular task;
- Practical training to apply equipment maintenance procedures and to exchange experience;
- Periodical and additional instructions on modifications in technological processes and (or) equipment, including the additional requirements regarding repair technique and instructions before a major repair;
- May include courses at other educational institutions in Lithuania and abroad.

11.2.4. Capabilities of plant simulators used for training with regard to fidelity to the plant and scope of simulation

Simulator purpose

The purpose of the INPP full-scope simulator is training of operators of Unit-2 MCR.

Simulator task

The simulator is intended for modelling the operations of the Unit with the RBMK-1500 type reactor both in normal and emergency conditions and is performing the following tasks:

- Initial training of the MCR operators;
- MCR staff qualification maintenance and improvement;
- Evaluation of plant's normal and emergency procedures.

Simulator functions

- Modelling of technological processes in a real time scale;
- Full-scope presentation of control desks and boards to replicate Unit control room-2;
- Modelling of information computing system, alarm and data display fragments;
- Control of initial conditions;
- Interactive screening of control desks and boards to the instructor's working place.

Simulator structure and configuration

The INPP full-scope simulator contains equipment of control desks and boards, servers, as well as operator's and instructor's stations.

Modelling scope

Simulator can model all the elements of Unit's technological systems both in normal and emergency conditions. The model enables to calculate 800 000 parameters with the discretization step of 0.25 seconds.

Specialty of simulator training after shutdown of INPP Unit-2 for decommissioning

The INPP provides the training of MCR staff at full-scope simulator in accordance with the requirements of the operation license issued by the VATESI.

The following scenarios were developed for personnel training in reactor shutdown and cold condition:

- Leak of coolant accidents;
- Plant blackout (in accordance to Fukushima accident);
- Personnel actions in deviations from normal operation mode.

The INPP full-scope simulator was used for the training of MCR staff to perform decommissioning project B12 – decontamination of Unit-1 main circulation circuit after reactor defueling.

11.2.5. Arrangements for training of maintenance and technical support staff

The system of personnel education is formed of the following parts:

- training under the programme;
- certification;
- development of the means for technical training aid and its support with relative organizational, training documentation, methodologies, technical and operational documentation;
- recording and archiving documentation on education of personnel.

Maintenance and technical support personnel at the INPP is trained using initial education and continuous training. To provide proper qualification and competence of the personnel a systematic way of training is used on different stages of education.

Initial education of the personnel consists of theoretical and in-service (probation) trainings. Theoretical training of the personnel is conducted using course method or individually by instructors of the INPP TS or by invited specialists of the INPP divisions.

In-service training (probation) is conducted for personnel to gain practical experience and skills at their workplace and is performed by in-service training instructors. In the process of probation an employee shall study and use rules, norms, job and operating descriptions at the workplace to the extent required in the job description, and gain experience in provision of accident-free, safe and efficient operation of the equipment maintained.

After the in-service training and prior to certification in certifying commission the examination of practical skills is performed.

The trained employee shall be certified for position in the corresponding certifying commission.

The continuous training of personnel includes:

- professional improvement during advanced training courses and special purpose training courses under the training programs;
- education for promotion of employee's category of proficiency;
- periodical and supplementary briefings intended to introduce changes of technological processes of equipment repair and supplementary requirements to repair technology, as well as ad hoc briefings prior to performance of repair works;
- trainings during implementation (application) of new materials, equipment, technologies, procedures and training on practical experience in performance of repair works at NPPs with RBMK type reactors;
- maintenance of required practical skills for performance of operational tasks prior to commencement of works;
- self-education (for managers and specialists).

11.2.6. Improvements to training programmes as a result of new insights from safety analyses, operational experience, development of training methods and practices, etc.

Continuous and further training of INPP personnel is performed according requirements for a particular position (e.g. periodic training to re-approve compliance to the qualification requirements of a safety important position), need to prepare for new activities or tasks of a division, other needs identified by a manager and discussed with an employee during annual individual appraisal meetings. TS are supporting managers of departments as an internal provider of training and, when needed, help to find and organise external training according the established needs. TS continuously is assessing effectiveness of training content and process, develops new programmes and training tools to support implementation of plans of INPP (e.g. to prepare new mock-ups for training on dismantling of contaminated equipment). TS work with line managers to establish training needs, assess training results after a trainee has worked for some time after the training.

TS also performs analysis of OEF lessons, organises training for TS specialists and makes practical observations of the related tasks to improve training content and methods.

11.2.7. Methods used to assess the sufficiency of staff at nuclear installations

VATESI document BSR-1.4.1-2010 requires from a licensee to assess, plan and ensure sufficiency of staff performing safety important activities and affecting safety related professes of a licensed organization. It's necessary to assess and establish the number of staff needed for safe operation, and their competence in a systematic and documented way. The document will also require to establish and annually update a long-term staffing plan for activities that are important to safety.

Additionally, it's required from a licensee always to have in house sufficient number of competent staff understanding the safety basis of a plant (e.g. Safety Analysis Report or Safety Case and other documents), as well as to understand the actual design and operation of the plant in all plant states.

The regulatory requirements and quality management procedures applied by INPP require to monitor sufficiency of staff for safe operation, their competence, and suitability for safety work on a regular basis and to document results of such assessments. For instance, assessment of the staffing level at INPP was annually indicated within the annual INPP safety report.

VATESI during regulatory inspections and other activities verifies suitability of personnel qualifications, quality of safety important training and sufficiency of competent INPP personnel to ensure safety of INPP.

11.2.8. Policy or principles governing the use of contracted personnel to support or supplement the licensee's own staff

Personnel of contracting organizations prior to commencement of works in the controlled area of the INPP is trained in the INPP TS under the Training program for contracting organizations personnel, performing works within the controlled area of INPP (MC-1410-23), whereupon personnel acquires respective knowledge and competencies in the area of radiation safety, fire safety, physical security, emergency preparedness and in other areas important to safety.

Operations managers of contracting organizations are certified in the certifying commission No. 2 of the INPP. Moreover, all the personnel of contracting organizations undergoes induction and initial briefings at the working place on fire safety, health and safety of workers and, if necessary, on radiation safety.

All the enlisted above allows, when necessary, the efficient involvement of the personnel of contracting organizations in employment of vacant positions within the structure of the INPP. In case of application to the vacant position within the structure of the INPP the personnel of contracting organizations is more likely to be selected for employment than other applicants who do not have work experience at nuclear facilities.

11.2.9. Methods used to assess the qualification and training of contractor's personnel

BSR-1.4.1-2010 requires from a licensee to establish personnel qualification requirements for safety important contractors within procurement documents, to monitor adherence to those and to this end to have enough specialists competent to perform this oversight and assess performance of a contractor.

INPP has implemented 2nd level quality management system procedure "Procurement" QA-2-017 that requires careful assessment of qualification of a possible INPP contractor. The assessment includes checking of competence of the key personnel of contractor and applied management system before a contract is approved.

After a contract for safety important activities is approved, INPP assigns the competent personnel to perform monitoring and inspections of implementation of a contract.

INPP requires from contractors for safety important tasks to be performed at INPP to undergo a special training programme on INPP requirements for safety, application of quality requirements and principles of safety culture. For instance, for maintenance contractors INPP provided several training sessions during on concerning safety culture, maintenance planning and outage management.

11.2.10. Description of the national supply of, and demand for, experts in nuclear science and technology

Plans to build a VNPP create an opportunity for a certain number of younger INPP specialists to join this project and use their knowledge and experiences for the VNPP.

After a political decision on construction of a new NPP first students began the nuclear engineering studies in the 2008-2009 academic year at Lithuanian universities. In preparation for building VNPP in Lithuania the Government is supporting activities of several national universities to establish and implement university studies in the areas important for work at VNPP. To address future workforce demand and the quality and quantity of nuclear education national plan for preparation of the specialists was approved by the order of Ministry of Energy and Ministry of Education and Science on May 25, 2011.

Number of national TSO already exists in Lithuania. They provide needed support to nuclear safety related projects in Lithuania and other countries. The activities will continue in the context of INPP decommissioning projects and projects in preparation to build VNPP in Lithuania.

Staff Management Procedure has been developed at VAE in order to ensure the quality of activities performed and on-going projects. The aims of the human resources management process described in this procedure are:

- To ensure that company shall have adequate human resources management competent to achieve VAE objectives;
- To ensure high level of the relevant personnel qualification for implementation of the objectives;
- To ensure VAE employees are provided with the necessary means and tools for their everyday work.

The procedure describes the responsibilities and order of performing the following activities:

- search for and selection and recruitment of competent new employees,
- provision of work equipment and tools required for work of employees;
- organization of work and training;
- termination of employment.

The procedure requires selecting a new employee for particular positions at VAE with the relevant background and experience in a particular field.

The new NPP construction project will require substantial volumes of professional, skilled and non-skilled labour force. The need for labour will not be linear and the number of people involved will vary depending on the construction stage. The process intensiveness will depend on the reactor construction technology chosen and work plan developed by Project Manager. The potential total volume of workforce required at the peak of new NPP construction may be around 6000 persons.

The skills required for a nuclear new build project are common to all large multi-disciplinary infrastructure projects, however certain specific nuclear skills will be required in the areas of safety and licensing, which is a specialist area covering safety analysis and safety case preparation.

The preliminary results of an evaluation of the demand for nuclear energy specialists shows that additionally, some 65 nuclear energy specialists will be needed during the pre-design stage, as well as 170 during the basic decision-making stage and 450 during the construction stage of the nuclear power plant.

Up to 900 well-trained specialists will be needed at the Project Development Company of VAE, which later will become the operator of Visaginas Nuclear Power Plant.

The National Energy Strategy, approved by Resolution No X-1046 of the Seimas of the Republic of Lithuania dated 18 January 2007, provided that „It is necessary to draft a national programme for the training of energy specialists and specify therein the tasks for organising the studies, the quality of the study programmes and the maintenance of the material base of the institutions organising studies by taking into consideration new needs and sources of financing. When

drafting and implementing this programme, national priority has to be given to ensuring the timely preparation of specialists for work in the new nuclear power plant regarding the phase of mounting its technological equipment."

Ministry of Education and Science of Lithuanian Republic is responsible for "The National Training Programme of Qualified Specialists in Nuclear Energy for 2008–2015" implementation. The Program is intended to provide the Lithuanian nuclear energy infrastructure with highly skilled nuclear professionals. The aims of the Program are to ensure the effective preparation of highly qualified nuclear energy specialists for VNPP and the entire nuclear industry and further develop nuclear knowledge, experience and practical, educational and scientific excellence.

In order to achieve this objectives two study programs were started:

- The Study of Nuclear Energy Physics at Vilnius University;
- Graduate and Postgraduate Studies of Nuclear Energy at Kaunas Technological University.

The goal of Nuclear Energy Physics study program – to prepare highly qualified nuclear physicist with expert knowledge in nuclear physics, neutron physics, nuclear reactors physics, radiation chemistry, nuclear material physics, nuclear fuel cycle, radiation ecology and safety, materials science, and to provide necessary university education in social and the human sciences.

The main purpose of Graduate and Postgraduate Studies of Nuclear Energy – to provide students of general technical and special nuclear energy education, to enable absorption of the essential knowledge of fundamental physics, theories and principles, to help develop nuclear power engineering design and manufacturing bases, introduce with operational technologies and to enable acquire the initial application skills, to provide the necessary social and human sciences knowledge.

It is expected that after implementation of the Programme about 30-50 new highly skilled nuclear energy specialist and nuclear physicists will be prepared each year as well as about 100 specialist will be retrained and improve their professional skills, acquire specialized training and will be certified annually.

11.2.11 Methods used for the analysis of competence, availability and sufficiency of additional staff required for severe accident management, including contracted personnel or personnel from other nuclear installations

There is no additional staff involved into severe accident management at the INPP. For more detailed information see Section S.1.1.

11.2.12 Regulatory review and control activities

Specialists of Lithuanian regulatory body (VATESI) are continuously concentrating their efforts on the supervision of qualification of the employees of the nuclear energy sector.

In supervising the training and qualification improvement system at the INPP, the VATESI follows the Requirements VD-E-11-2001, the IAEA safety standards, recommendations and the best practice of other countries. Even after the final shut-down of both Units of the INPP, VATESI has not altered the commonly recognized approach that a nuclear facility has to be operated by a sufficient number of highly qualified employees. VATESI specialists coordinate the training programs, exam questionnaires, take part in the exams to evaluate the competencies of the INPP specialists responsible for safety.

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 thought the life of a nuclear installation.

12.1. Overview of the Contracting Party's arrangements and regulatory requirements to take human factors and organizational issues into account for the safety of nuclear installations

Human factors and organizational issues have significant importance for safety of NI. Lithuanian legislation covers the above issues in the several regulations: VD-E-11-2001 "General Requirements for Personnel Management in the Organizations Operating Nuclear Facilities and Enterprises Rendering Services to Them", BSR-1.4.1-2010 "Management Systems Requirements", VD-T-001-0-97 "Nuclear Safety Regulations for the Reactor's of Nuclear Power Plants".

The extensive regulatory requirements on human factor are set in BSR-2.1.2-2010 "Basic Safety Requirements for Nuclear Power Plants with RBMK-1500 Reactors" and cover the following aspects:

- Operating organization;
- Responsibility and authorities;
- Assurance of resources for adequate performance of functions and tasks;
- Safety culture;
- Staff competence assurance;
- Operational experience feedback;
- Design:
- Requirements to prevent single human error as well as mitigate its consequences;
- Control room design;
- Optimal human-machine interface;
- Submission with adequate information for operators.

VD-E-11-2001 defines more specific requirements for organizational structure and distribution of functions, staff recruitment, training and qualification and staff certification.

Human factors and organizational issues during modification process are addressed in BSR-1.8.2-2011 "Categories of Modifications of Nuclear Installations and Procedure of Performing the Modifications". The information on regulatory requirements regarding organizational factors and arrangements to implement them is presented within Article 10 and Article 13 of this report. INPP adheres to the requirements and VATESI performs the regulatory oversight of INPP compliance to them.

12.2. Consideration of human factors in the design of nuclear installations and subsequent modifications

Human factor management at INPP is based on the consideration of organizational, labour (professional), environmental factors, as well as individual abilities and other characteristics of human behaviour at work to preclude safety problems. Human factors and organizational issues during modification process are addressed in BSR-1.8.2-2011 "Categories of Modifications of Nuclear Installations and Procedure of Performing the Modifications".

INPP personnel management process includes recruitment, primary and continuous training, certification and permission of personnel to work on their own at INPP, is regulated by the documents indicated in Article 11.

12.3. Methods and programmes of the licence holder for analysing, preventing, detecting and correcting human errors in the operation and maintenance of nuclear installations

Human factor affects many aspects of safe decommissioning of a nuclear facility and first of all in such activity fields as nuclear, radiation and fire safety assurance, physical security, safety and health of employees.

Human factor management at INPP is based on the consideration of organizational, labour (professional), environmental factors, as well as individual characteristics of a person, which affect his/her behaviour at work in such a way that it may harm his/her health or nuclear facility safety.

The activity related to the "Human Factor" management at INPP is carried out with consideration for the following:

The personnel has everything necessary to carry out its duties (documentation, materials and equipment) and is duly trained and certified.

The operating conditions at the enterprise meet current standards and do not allow that hazardous influence of physical, chemical, biological and other harmful factors exceed the specified limits.

INPP personnel safety and health system is aimed at ensuring the safety and health of the personnel, reduction of occurrence of accidents and rate of personnel occupational diseases.

Working places of the personnel responsible for the plant safety meet current ergonomics requirements. The man-machine interface provides sufficient data about the on-going operating processes, status of process systems as well as systems of control and personnel attention in case of deviations from normal operation. Prior to the beginning of work the medical control of operating personnel is mandatory.

Conditions for collection, analysis and introduction of the personnel proposals were created. Motivation of the personnel is carried out, labour and social warrantees and benefits for employees being dismissed are established. At the level of the enterprise the group for application of operating experience was formed and currently is working.

The personnel activities are being monitored. There is a system that ensures recording of incidents caused by human error at the INPP, investigation of the causes and development of corrective measures; performs probabilistic safety assessment considering human factor and monitor psychophysical capabilities of personnel providing safe operation of the nuclear facility.

Considering the Human Factor Management Programme existing at INPP, activity on human factor management at the enterprise is performed in the following areas:

- Selection of personnel;
- Personnel recruitment;
- Personnel training and qualification;
- Personnel motivation;
- Provision of information;
- Personnel reliability;
- Workplace organization;
- Documentation control;
- Modifications;
- Using internal and industrial experience;
- Decommissioning organization.

The personnel action, not defined in the instructions, and errors are subjected to reviewing to identify direct and basic causes of the event, to eliminate causes and prevent further recurrence, the corrective measures are developed and taken.

Different aspects of motivating in respect of incentives for the personnel are highlighted in "Policy" of the plant. In addition, the motivation issues are considered during training and workshops on safety culture, which are conducted for the plant personnel on a regular basis.

Human factors related unusual events at INPP are carefully investigated by commissions appointed in accordance with the norms and technical requirements in force. INPP is responsible for ensuring that the investigations are performed satisfactorily and in full, for reporting the results to VATESI and other interested organizations. Also the licensee is responsible for measures to perform needed corrections and to eliminate the root causes of an unusual event to preclude repetitions of similar events.

Human factor Management Methods and Programmes at the VNPP

Taking into account the nature of the activities of VNPP and that their results will form a basis for the future NPP construction, human factor related risks are managed by implementation of effective procedures, quality management system and by providing the adequate training.

The activities of the company are project based. In line with the company's procedures the experience gained during the implementation of the preparatory works projects is being taken into account throughout all the stages of the implementation of other projects of VNPP.

Experience is being reported by the projects managers to the Project Management Committee which ensures the distribution of the received information to all VNPP project managers thus providing the input to apply the lessons learned across VNPP projects.

12.4. Self-assessment of managerial and organizational issues by the operator

The procedure for self-checking and self-assessment is regularly revised; the self-assessment of activity at the level of INPP divisions is carried out on a yearly basis. While preparing and performing the works that have an impact on safety, the personnel uses the self-control methodology STARK.

Self-assessment activities of INPP are described within Article 10 of this report.

12.5. Arrangements for feed-back of experience in relation to human factors and organizational issues

The blame free work culture, when errors are seen as an opportunity for improvement is continuously being supported by managers of INPP.

The importance of the human factor as a significant matter in safety is taken into account in the methodology of the evaluation of operational events. Event analysis methodology applied at INPP is based on ASSET method and is directed towards identification of direct and root causes of the event. Direct and root causes of the individual events are classified as equipment failures, documentation deficiency or humane error. In case human factor impact is identified during the determination of causes, detailed investigation of human factor impact analysis for the respective event is performed. The analysis results are the integral part of the overall analysis of the respective operational event. To ensure the analysis is performed systematically, INPP applies the special "Procedure for additional analysis of events caused by the incorrect personnel actions during unusual events". Such analysis identifies measures for prevention of events and their recurrence in the future as well as sharing the experience gained.

Audit, Safety and Quality Management Division carries out analysis of human factor impact on INPP safety. The division is responsible for carrying out special investigation of unusual events due to personnel error and (or) organizational factors. To perform the analysis INPP applies a special document "Method for Detail Analysis of Unusual Events Related to Incorrect Actions of Personnel". According the document, the division forms a team of competent specialists. The methodology combines Man-Technology-Organization and ASSET methodology.

The analysis is performed by using a relevant method (or their combination) from the following list of methods:

- Task analysis;

- Changes analysis;
- Barrier analysis (for physical and administrative barriers that ensure safety);
- Event cause-effect analysis diagram;
- Fault tree analysis.

The team reviews the relevant documents, perform needed interviews, model and analyse causes of the event, its sequence and the related barriers, and develops the analysis report. Operating experience and feed-back related information is presented within Article 19 (7) of this report.

12.6. Regulatory review and control activities

Through the regulatory review and assessment of safety documentation submitted by a licence holder, as well as inspection activities, VATESI ensures that the licence holder adequately addresses human factor issues through all lifetime of nuclear facilities. The general information on regulatory activities of VATESI is presented within Section 9.3.

VATESI has established the permanent commission of competent specialists of the regulatory body for analysis of unusual events. This commission monthly meetings cover reviews of recent and other IAEA IRS reports as well as reports from INPP on unusual events, including those on the events due to human factors and (or) organizational issues. Commission provides recommendations to INPP to apply lessons learned, to review relevant IRS reports and (or) to present additional information on the events at INPP. The commission also provides recommendations to INPP for application of the lessons and performs follow-up of its recommendations to INPP.

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 the nuclear installation.

13.1. Overview of arrangements and regulatory requirements for quality assurance programmes, quality management systems, or management systems of the licence holders

According to the Law on Nuclear Safety the one of the main areas of nuclear safety regulation is the management systems of the persons engaged in the licensed activities and in other operations related to nuclear and/or nuclear fuel cycles materials, as well as in the evaluation of construction site of a nuclear installation. The highest priority in the management system of such persons shall be the assurance of nuclear safety. Organisations operating nuclear installations and other holders of licences and/or permits must ensure high level of safety culture and competence of the organisation and its workers, on a regular basis analyse the state of nuclear safety and improve it, consider human factors (human capabilities and their limits) at all stages of life of a nuclear installation and maintain an effective integrated management system with reasonable priority on nuclear safety.

BSR-2.1.2-2010 "Basic Safety Requirements for Nuclear Power Plants with RBMK-1500 Reactors" requires that safety of the NPP shall be ensured by implementing a system of technical and organizational measures, including a management system at the NPP. Those technical and organizational measures shall be experience based and comply with the legal acts, norms and regulations. Such approach shall be applied during all life cycle of the NPP.

On the 21st of June, 2010, BSR-1.4.1-2010 "Management Systems Requirements", based onto the IAEA safety standard GS-R-3, was approved. The regulations specify regulatory requirements for development, implementation and maintenance of an effective management system for the organizations operating nuclear facilities and require covering all activities related to the use of safety important systems and components by management system's documentation and periodically assess effectiveness of the management system. To this end an operating organization must establish an independent department to oversee application of management system requirements and coordinate its improvement. The licensee and its safety-important contractors shall comply with all national legal requirements and regulations, including those in the area of nuclear safety.

According to the BSR-1.4.1-2010 licensee by developing management system shall consider application of the IAEA recommendations published in the IAEA guides on management systems. The BSR-1.4.1-2010 establishes requirements for implementation and continuous improvement of the integrated management system based upon GS-R-3 process approach including requirements as follows:

- periodically assess, monitor and continuously develop safety culture;
- to establish and constantly update management system documentation, and manage changes to the documents and identify the changed content within the documents;
- to approve safety as the top priority and the related commitment of management of a licence holder;
- to take into account requirements of interested parties during establishment and development of the management system, in decision-making process and in activities of a licence holder;
- to identify clearly responsibilities and roles of all employees for safety, implementation of the system requirements and adherence to safety and other legal requirements;

- to plan and ensure necessary human, financial and other resources necessary to ensure safety and implement goals and commitments of a licence holder;
- to identify, implement and improve processes with strict and systematic consideration of safety and other requirements when establishing processes and their interactions so the applicable legal requirements and standards are implemented in a safe and proper way;
- to ensure proper cooperation of management levels and different divisions for safe and effective performance;
- to apply reliable control mechanisms over activities performed by safety important contractors and still to retain the ultimate responsibility of a licence holder for safety;
- carefully prepare, plan, implement, monitor, adjust organizational changes and assess them after implementation to preclude deterioration of safety;
- to apply sufficient measurements, monitoring, control and checking activities and needed methods to ensure high level of safety, identification and following-up of needed improvements and effectiveness of the management system;
- to apply management self-assessment through all levels of management and to use the results to improve safety, safety culture and activities;
- to apply independent assessments and audits as an additional mechanism to proactively resolve safety issues and retro-actively identify needed corrections and opportunities to improve processes, the management system and (or) their documents;
- periodically perform comprehensive management reviews of the management system and to plan continuous improvement and resources to implement improvement activities.

13.2. Status with regard to the implementation of integrated management systems at nuclear installations

The INPP management system integrates all organizational components (including its structure, resources, processes and safety culture) so as to establish the goals and objectives of the organization and enable the organization to achieve all of these goals and objectives.

The INPP integrated management system (hereinafter, IMS) provides a single framework for the arrangements and processes necessary to address all the goals and objectives of the organization. These goals and objectives include safety, quality, environmental, health, security and economic elements and other considerations such as social protection.

The application of the IMS requirements is graded so as to deploy appropriate resources, on the basis of the consideration of the significance and complexity of each product or process, the hazards and the magnitude of the potential impact associated with the safety, health, environmental, security, quality and economic elements of each product or process and the possible consequences if a product fails or a process is carried out incorrectly.

The INPP Senior Management is ultimately responsible for the IMS and shall ensure that it is developed, implemented, assessed and continually improved in accordance with the established requirements and objectives. Within the INPP organization this function is assigned to Audit, Safety and Quality Management Department (AS&QMD). This is an organizational unit, which is independent from other functions and reports directly to Director General of the INPP. The AS&QMD Manager in the capacity of the Senior Management Representative has the specific authority and responsibility for coordinating the IMS development, implementation, assessment and continual improvement. The personnel of this department are appropriately trained and qualified to conduct the tasks.

13.3. Main elements of a typical quality assurance, quality management or management system programme covering all aspects of safety throughout the lifetime of the nuclear installation, including delivery of safety related work by contractors

INPP Safety and Quality Policy

The INPP Senior Management establishes goals, strategies, plans and objectives that are consistent with the policies of the organization and appropriate to the activities and facilities of the organization.

The following main principles are formulated in the INPP Safety and Quality Policy:

- ensure safe, effective and efficient decommissioning;
- cultivate strong safety culture at all levels in the organization;
- demonstrate leadership and commitment to safety at all levels of the management;
- develop and implement an effective management system in compliance with all established requirements;
- ensure clear distribution of functions, authorities and responsibilities within the management system;
- continually assess and improve the management system, resources, processes and safety culture;
- foster active involvement of all personnel in the implementation and continual improvement of the management system;
- ensure social responsibility and social protection of the personnel;
- reporting on the IMS performance, including its influence on safety and safety culture, and any need for improvement;
- resolving any potential conflicts between the IMS requirements and within the IMS processes.

Development and implementation of the INPP IMS

It is described by a set of documents specifying the overall controls and measures to be developed and implemented by the organization to meet the established requirements and objectives. These controls and measures apply to every unit and individual within the organization. The IMS documentation structure is shown in Figure A.4 (see Annex V)

The IMS Manual is Level 1 document applicable to development, implementation, assessment and continual improvement of the IMS. It provides vision, mission and objectives of the organization, organizational policies, organizational structure, levels of authority and responsibilities and accountabilities of the Senior Management and organizational units, the IMS documentation structure, an overview of the IMS processes, responsibilities of the process owners and arrangements for measuring and assessing the IMS effectiveness. The organizational processes are listed in Annex V.

All these processes are described in Level 2 documents (hereinafter, IMS procedures). The IMS procedures are documented process descriptions and provide specific details on which activities shall be performed and which organizational units shall carry them out so as to meet the general requirements specified in the IMS Manual.

The typical contents of Level 2 documents include:

- the purpose and scope of application;
- the authorities and responsibilities of the managers and process owners for the activities (sub-processes) described within the IMS procedure;
- information on how these activities shall be conducted, including planning, performance, control and improvement considerations (process inputs/outputs, interfaces and communications, key performance indicators, measurements, analysis, corrective/preventive actions,

improvements, decision-making);

- documents and records required to permit the activities; records to be retained after they have been completed;
- references to the IMS Manual and other IMS documents as appropriate.

Level 3 documents are detailed working procedures; they are developed in accordance with the requirements specified in the IMS procedures and prescribe the specific details for the performance of tasks by organizational units or individuals.

Level 4 documents are records stating objective evidence of activities performed or results achieved.

Development and implementation of the VAE QA

Project Management Procedure has been developed at the VAE for on-going projects and preparatory works. The VAE was established in 2008 with the main task to develop a new NPP project in Lithuania (see Section 10.1.1.). The aim of Project Management Procedure is to ensure the success of projects and effective results achievement by effective utilizing of the organization resources. This procedure is applied for all VAE projects. Project Management Procedure describes the order of project initiation, project initial assessment, project planning, assessment of the project implementation methods and potential risks, project implementation and control, project closing and acceptance of the results.

To maintain appropriate level of project management VAE staff has project management professional certificates.

VAE has developed and approved the Quality Assurance Program for the key projects since 2009. The Program contains sections as safety policy, procurement documents management, project documents management, control of purchasing items and services, control of special works, inspections, examinations and surveillances, siting work examination, control of non-compliances, quality assurance records, audits, siting report preparation. To maintain appropriate level of quality, the VAE personnel have certificates as Quality Management Systems Lead Auditor and have conducted adequate Nuclear Lead Auditor Training courses.

The results of vital projects were also reviewed by independent reviewers. All independent reports were attached to the siting documentation provided to the VATESI. Qualification criteria for independent reviewers were also approved at the top level of the VAE management.

13.4. Audit programmes of the licence holders

The Senior Management and management at all other levels in the INPP carry out self-assessment to evaluate the performance of work and the improvement of the safety culture.

Independent assessments are conducted regularly on behalf of the Senior Management:

- to evaluate the effectiveness of the IMS processes and adherence to the established requirements and objectives;
- to determine the adequacy of work performance and leadership;
- to evaluate the organization’s safety culture;
- to monitor product quality;
- to identify opportunities for improvement.

The independent assessment process covers internal IMS audits, audits of quality management systems of suppliers of safety-related products, surveillance inspections, engineering surveys, review of safety-related operating documents, modifications, decommissioning projects, event reporting, corrective actions developed in response to the VATESI inspections, and licensing-related documents.

The owner of the independent assessment process is AS&QMD Manager.

Audit reports are distributed to the INPP senior managers, managers of audited departments, senior managers of audited suppliers and to the VATESI as appropriate.

The audits are conducted by the INPP personnel, who are in the list of qualified lead auditors/auditors. This list is updated annually. There is a procedure specifying requirements for lead auditor/auditor qualifications. The AS&QMD personnel are adequately trained and qualified to fulfil these tasks.

Management system reviews are conducted by the Senior Management at planned intervals to ensure the continuing suitability and effectiveness of the IMS, and its ability to enable the objectives set for the organization to be accomplished. This includes the review of:

- outputs from all forms of assessment;
- results delivered and objectives achieved by the organization and its processes;
- non-conformances and corrective and preventive actions;
- lessons learned from other organizations;
- opportunities for improvement.

Director General of the INPP exercises continuous control over quality management related activities. Quality management issues are discussed at regular meetings chaired by the Director General.

The processes and products that do not conform to the specified requirements are identified, segregated, controlled, recorded and reported to an appropriate level of the management within the organization. Corrective actions for eliminating non-conformances are determined and implemented. Preventive actions to eliminate the causes of potential non-conformances are determined and taken.

The opportunities for the improvements of the IMS are identified, and actions to improve the IMS processes are selected, planned, implemented and recorded. Annual reports on improvement of the INPP IMS are submitted to the VATESI.

13.5. Audits of vendors and suppliers by licence holders

See Section13.4.

13.6. Regulatory review and control activities

The Law on Nuclear Safety states, that the licences and permits shall be issued to persons with sufficient capacities in terms of technological and financial resources, management system, human resources, emergency preparedness, physical protection, safe storage and shipment of nuclear materials, their accounting and control that comply with the provisions on implementation of the IAEA and the EURATOM guarantees, and allowing to properly fulfil the conditions required by the licence or permit and to secure nuclear safety.

The regulations for issuing licenses and permits for nuclear power facilities and activities require applicants to submit to the VATESI to review and assess such documents as:

- procedures for selection, training and certification of the employees and improvement of their qualifications;
- description of means for safety culture development;
- documentation of 1st and 2nd level of management system;
- description of organizational structure;
- procedures related to selection, approval and control of suppliers and quality assurance of safety-important products, services and works;
- description of measures for employment of operational experience.

The VATESI periodically performs review of the INPP's management system's documents, reports of audits, including those performed at contracted organizations, reports on safety issues,

reports on safety culture monitoring, assessment and carried out surveys, the documentation of modifications' to the nuclear installations including organisational changes whether they comply with legal acts and potential risks on safety are evaluated and properly managed.

During other regulatory oversight activities, e.g. inspections, VATESI specialists analyze and inspect management system's documents related to the particular activity or safety issue. When needed, inspectors of the VATESI require to improve activities or to make necessary corrections in the INPP management system's documents and (or) practice. The VATESI performs the inspections of the activities of the INPP related to conducting the audits at the contractors' organizations involved into the INPP's decommissioning projects. The goal of such inspection is to ascertain how the INPP is performing the assessments (audits) of the management systems of the suppliers that are relevant to safety and of the capability of these suppliers to meet the requirements of the procurement documents.

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. Article 14(1) – Assessment of safety

14.1.1. Overview of arrangements and regulatory requirements to perform comprehensive and systematic safety assessments

The Law on Nuclear Safety, adopted in 2011, among other provisions, establishes the main principles for safety assessment. This law also establishes the system of technical codes and standards documentation of nuclear safety which is base of the regulatory requirements arrangement.

Pursuant to Article 30 of the Law on Nuclear Safety the assessment of nuclear safety shall be a systematic process intended for verifying whether the operation of a nuclear installation and its decommissioning are safe – i.e. meet safety requirements established by the legal acts, technical codes and standards documents of the licence or permit holder. The assessment of nuclear safety shall be conducted in the prescribed manner at all the stages of a lifecycle of a nuclear installation. The assessment of nuclear safety shall get sufficient attention and shall be assigned sufficient resources. The amount of resources shall be adequate to a possible issue's impact on nuclear safety.

Pursuant to Article 5 of the Law on Nuclear Safety the system of technical codes and standards documentation of nuclear safety comprised of the following:

- the nuclear safety requirements and rules;
- the standards;
- the technical codes and standards of a licence or permit holder;
- the technical codes and standards of persons conducting the evaluation of the construction site of a nuclear installation.

The nuclear safety requirements and the nuclear safety rules are mandatory to all persons who are involved in nuclear energy activities.

The regulatory requirements and guidelines necessary to perform comprehensive and systematic safety assessments are established in the existing VATESI legal acts.

Furthermore, there is prepared VATESI procedure Regulations for preparing the nuclear safety requirements and nuclear safety rules, which establishes a working group coordinating the preparation of VATESI legal acts. This working group has been functioning at VATESI since 26 August 2009. Based on the proposal of the this working group, a five-year (2010-2014) VATESI Programme for upgrading of existing and preparation of new nuclear safety requirements and nuclear safety rules was approved by VATESI Head in 31 December 2009, and is updated every year. The last version of this programme was approved by VATESI Head in 14 December 2012.

VATESI Programme for upgrading of the nuclear safety requirements and nuclear safety rules include upgrading of the relevant regulatory requirements necessary to perform comprehensive and systematic safety assessments, e.g. Requirements for Probabilistic Safety Analysis, Requirements for Deterministic Safety Analysis et al.

14.1.2. Safety assessments within the licensing process and safety analysis reports for different stages in the lifetime of nuclear installations

Pursuant to Article 30 of the Law on Nuclear Safety the assessment of nuclear safety is comprised of two main stages:

- the analysis and justification of nuclear safety;
- the review and assessment of nuclear safety.

The analysis and justification of nuclear safety in the area of nuclear energy activities as well as other activities involving nuclear and/or nuclear fuel cycle materials is carried out by the applicant or the licence holder; whereas the analysis and justification of nuclear safety during the evaluation of the construction site of a nuclear power plant is carried out by the persons implementing a nuclear installation project. The results of the analysis and justification of nuclear safety are executed in the documents evidencing nuclear safety which are established in the manner prescribed in the Law on Nuclear Safety and other legal acts. The results of the analysis and justification of nuclear safety are independently verified in the manner set out by VATESI. The applicant or the licence holder is responsible for the performance of such independent verification, whereas in case of the construction site of a nuclear power plant evaluation – the responsibility for performance of an independent verification falls on persons implementing the nuclear installation project design.

The review and assessment of nuclear safety shall be conducted by VATESI. The results of the review and assessment of nuclear safety are executed in the documents which are established by the Law on Nuclear Safety and other legal acts.

The applicant or the licence holder, whereas in case of evaluation of the construction site of a nuclear power plant – the persons implementing a nuclear installation project, shall have a right to involve scientific-technical support organisations and external experts, specialists, and consultants for carrying out the analysis and justification of nuclear safety and for preparing other related documents as well as for performing an independent verification of such documents, however, liability for the results of such activities are fall either on the applicant or on the licence holder.

Safety analysis report, taking into consideration different stages in the lifetime of nuclear installations, shall be submitted to VATESI for the review and assessment and is established in the Law on Nuclear Safety.

In addition to the safety analysis report, VATESI shall be provided with all design documents of a nuclear installation design, which are necessary for the assessment of the safety analysis report. The nuclear installation design documentation shall establish and classify all the structures, systems and components of a nuclear installation according to their functions and importance to safety, and shall contain a comprehensive description of all the structures, systems and components and operation processes that are important to safety.

Upon introduction of modifications to a nuclear installation, or after discovering the circumstances which were not evaluated when designing, constructing and operating a nuclear installation or in other specified cases, the licence holder shall be required to update a safety analysis report of a nuclear installation. The amendments to a safety analysis report of a nuclear installation may be made only if they are coordinated with VATESI.

In case of implementation of separate modifications to a nuclear installation, testing that was not foreseen in the design, or other divergences from a nuclear installation design and other cases defined in the legal acts or the nuclear installation design shall be subject to a separate safety analysis and justification which shall be executed in the documents evidencing safety.

VATESI could require additional documents or conduct inspections, if it finds out that after review and assessment of the submitted documents the information is not sufficient to assess the documents following the legal acts and valid criteria. It also assess the safety culture in the applicant organization and assess its technical and organizational measures, verify the effectiveness of the quality assurance system of the applicant and check if the requirements of the quality assurance system at the nuclear facility for purchased services or goods are kept.

14.1.3. Periodic safety assessments of nuclear installations using deterministic and probabilistic methods of analysis, as appropriate

The requirement for periodic safety assessment of nuclear installations using deterministic and probabilistic methods of analysis is established in the Law on Nuclear Safety. Not less frequently than every 10 years after the issuance of a permit for starting the industrial operation of a nuclear installation, the licence holder must make a periodic safety analysis and justification and prepare a periodic safety analysis report, which shall be submitted to the State Nuclear Power Safety Inspectorate for its review and assessment. Thereafter, the State Nuclear Power Safety Inspectorate shall adopt a decision regarding the coordination of such report.

During the periodic safety analysis and justification it shall be established whether, considering the changes in legal regulation and the construction site and/or surroundings of a nuclear installation as well as taking into account ageing of structures, systems and components and other factors that might have an impact on safety, it is ensured that a nuclear installation complies with its design, legal acts and normative technical documentation requirements of nuclear safety. If there are any inconsistencies detected, the licence holder shall prepare and implement indispensable corrective measures which would secure the nuclear installation's compliance with its design, as well as ensure proper fulfilment of all requirements set in legal acts and technical standard documentation of nuclear safety. During the periodic safety analysis and substantiation it shall be also established whether radioactive discharges, their intensity as well as the pathways, media or points of their spread comply with those defined in the plan for radioactive discharges into environment, and together with the periodic safety analysis report shall provide the updated plan for radioactive discharges into environment. The requirements for preparation of the periodic safety analysis and substantiation are established by the Head of the State Nuclear Power Safety Inspectorate.

License for operation of Unit 1 was granted to INPP in July 1999 and Unit 1 was shutdown on 31 December 2004. License for operation of Unit 2 was granted to INPP in September 2004 and Unit 2 was shutdown on 31 December 2009.

After approval of Decommissioning Projects for final shutdown and defueling phase of Unit 1 (Project U1DP0) and Unit 2 (Project U2DP0), INPP was obtained permissions for preparation and implementation of activities, related to decommissioning in both Units. Projects U1DP0 and U2DP0 were approved by the State Nuclear Power Safety Inspectorate accordingly on January 15, 2007 and in September 3, 2010.

Decommissioning Projects for final shutdown and defueling phase of INPP Units includes safety analysis report for those phases, which aims are to show that during final shutdown and defueling phases, all decommissioning activities may be safely performed within the limits of the Expanded operational license.

The structure of safety analysis report for final shutdown and defueling phase is similar to the one of the existing safety analysis report for operation of INPP Units. Taking into account the analysis and justification of nuclear safety performed in the frame of decommissioning of INPP accordingly in 2007 and in 2010, the next periodic safety assessment will be carried out for Units 1 and Units 2 of INPP accordingly in 2017 and in 2020. This position is included in conditions of licences for operation of corresponding units.

Due to these facts no periodic safety assessments of Unit 1 and Unit 2 of INPP was conducted in period of 2010 - 2014.

14.1.4. Overview of safety assessments performed and the main results of those assessments for existing nuclear installations

Safety assessment of INPP was performed initially by the designers of reactor plant and INPP as a whole and was documented in so called *"Technical Justification of Safety"*. The first in-depth safety analysis of INPP using Western methodology was completed in 1997. Main results of this analysis were presented in the first Lithuanian report. In-depth safety analysis for Unit 2 was finished in 2004. The Safety Analysis Report (SAR-2) for INPP Unit 2 was one of the key documents for

obtaining the license. The principal objectives of the report were to identify the current safety level of the Unit 2, to assess the factors that may affect its operating safety, and to recommend compensatory measures that would improve safety. SAR-2 and its review conclusions confirmed that the technical condition and operation of Unit 2 meet the key nuclear and radiation safety requirements set forth in standard documents of the Republic of Lithuania and international regulations. No major deficiencies were revealed that would necessitate shutting the Unit 2 down immediately or reducing its power.

In response to the events at Japan's Fukushima Daiichi Nuclear Power Plant, the stress tests were conducted in 2011 – 2012 at INPP according to ENSREG stress tests specification. More details on stress tests results and safety improvements measures associated with post-Fukushima lessons learned are presented in sections 6 and S.1.1 of this report.

VAE as a company responsible for the implementation of the preparatory works for the construction of the new NPP has performed a potential site evaluation against national and IAEA requirements. Site evaluation process has started in 2008. Evaluation included both deterministic and probabilistic assessments of various site related phenomenon. The site evaluation report is comprised of the parts such as Assessment of Meteorological Hazards, Dispersion of Radioactive Material and Evaluation of Distribution of Population, Assessment of Unintentional Human Induced Events, Description of Possibilities for Application of Physical Security Measures at Potential Construction Sites of Visaginas NPP, Description of Possibilities for Emergency Planning, Evaluation of Ultimate Heat Sink Characteristics and Assessment of Flooding hazards, Detailed Evaluation of Gas Explosion, Evaluation of geological and seismological conditions at potential VAE sites using seismic exploration data, Investigations of Engineering geological and Geotechnical Conditions, Investigation of Deep Geological Setting of Potential Construction Sites of VNPP by Using 2D/3D Seismic Survey, Geotechnical, Geological, and Seismological (GG&S) Data Inventory for the Visaginas Sites; Constructional Remains and Subsurface Geologic Setting Survey at Potential Visaginas NPP Sites using Electrical Tomography Method. Also site evaluation report includes a peer review reports for all its parts.

The main result of this activity is that after considering the following aspects:

- The effects of external events occurring in the region of the Visaginas sites;
- The characteristics of the Visaginas sites and their environment that could influence the transfer to persons and the environment of radioactive material that has been released;
- The population density and population distribution and other characteristics of the external zone in so far as they may affect the possibility of implementing emergency measures and the need to evaluate the risks to individuals and the population.

It was concluded that there are no exclusion criteria and no deficiencies that cannot be compensated for by means of design features, measures for site protection or administrative procedures. Therefore, both investigated sites are suitable for construction of the VNPP.

Site Evaluation Report was reviewed by Independent IAEA Site Safety Review Mission (SSRM) which took place on 8–12th of November, 2010. IAEA experts stated that "Sites evaluation is conducted in line with IAEA requirements and guides, the volume of investigation is sufficient, and sites are suitable for construction of Visaginas NPP". The experts of the mission have submitted several recommendations, which may be implemented only after selecting of nuclear technologies and layout of nuclear facilities providing opportunities for additional investigations related with design works.

Site Evaluation Report was reviewed by Lithuanian authorities involved in coordination, including Lithuanian Hydro-meteorological Service, Lithuanian Geological Survey, Lithuanian Radiation Protection Centre, Fire and Rescue Department, under Ministry of Interior, Civil Aviation Administration. Currently the results of the evaluation are being coordinated with State Nuclear Power Safety Inspectorate that finally will approve the Site Evaluation Report.

The results of the Site Evaluation report shall be used in design process of the VNPP and shall constitute (updated where necessary) a part of the future PSAR.

14.1.5. Regulatory review and control activities

Regardless of the fact that INPP Unit 1 and Unit 2 were finally shut down, INPP has been further performing the safety improvement works in 2010 – 2014 in accordance with the INPP's *Safety Improvement Programme SIP-3*. To assure the adequate supervision of the safety improvement measures listed in the *Plan of the 'stress tests" safety improvement measures*, INPP included the measures of the *Plan of the 'stress tests" safety improvement measures* into the INPP *Safety Improvement Programme SIP-3*. More details on *Safety Improvement Programme SIP-3* are presented in section 6 of this report.

In period of 2010 – 2012, VATESI specialists conducted the planned inspections at INPP. VATESI specialists inspected the accident management measures at INPP. Special attention was given to the prevention and management of the beyond design basis accidents in the spent nuclear fuel storage pools of Unit 1 and Unit 2. The results of VATESI inspections confirmed that the accident management measures, including mobile equipment, which dedicated to the management for the beyond design basis accidents, is available, maintain and tests in line with the relevant instructions.

14.2. Article 14(2) – Verification of safety

14.2.1. Overview of arrangements and regulatory requirements for the verification of safety

VATESI performs the supervision of maintenance, in-service inspections of structures, systems and components important to safety and ageing management processes at INPP in accordance with Nuclear Safety Requirements BSR-2.1.2-2010 "Basic Safety Requirements for Nuclear Power Plants with RBMK-1500 Reactors", "Basic maintenance requirements for Nuclear power plants, VD-E-01-98" and "Ageing Management Requirements of Systems and Elements important to safety of Nuclear Power Facilities, VD-E-05-99".

14.2.2. Main elements of programmes for continued verification of safety

Although presently the INPP is not operating, but prior to its decommissioning the operational maintenance and in-service inspection have to be carried out.

In compliance with the Quality Management Programme and Documentation control system acting at the INPP all works related to maintenance, in-service inspection of structures, systems and components important to safety and ageing management are performed only on the basis and in accordance with documents, which are agreed with VATESI.

Regardless of facts that INPP Units 1 and 2 were finally shut down and configuration of its systems and components has been significantly altered, INPP has been further performing non-destructive testing of fuel channels, piping metal condition and equipment of systems important to safety in accordance with the INPP Regulations ("Regulation Control of the Piping Metal Condition and Equipment of Systems Important to Safety in Unit-2 of the Ignalina NPP with the RBMK-1500 Reactor" and "Regulation Control of Fuel Channels in Unit-2 of the Ignalina NPP with the RBMK-1500 Reactor in Pursuance Decommissiong Project"), agreed with VATESI. These regulations have been developed in accordance with the requirements for in-service inspection (PNAE G-7-008-89 and PNAE G-7-010-89), experience of in-service inspection in other nuclear power plants, and IAEA Safety Guide "Maintenance, Surveillance and In-Service Inspection of Nuclear Power Plants", NS-G-2.6. Regulations determine requirements of in-service inspection (methods, frequency, volume and regions (places)) and assessment of results of performed in-service inspection for systems important to safety.

Every year the INPP prepares in-service inspection Programme of piping metal condition, equipment of systems important to safety and every two years the INPP prepares in-service inspection Programme of fuel channels on the basis of above mentioned Regulations. These Programmes have to be agreed with VATESI.

During operation phase of the INPP in-service inspections were performed by the INPP staff

(Metal and Technical Control division), but due to final shutdown both of the INPP Units was performed modification of the INPP organization structure and this division was liquidated. Now in-service inspections at the INPP are carried out by accredited Contractor organisation.

Staff of the INPP together with representatives of the Contractor performs technical verification of pressurized components (equipment and piping) important to safety. VATESI's Surveillance Division performs appropriate regulatory oversight (technical inspections) of these activities. The technical verification comprises external and/or internal inspection of equipment and piping, checking of parameters that prove the compliance of pressurized components with safety requirements, testing of the components and other actions aimed at assessing their adequacy in terms of safety.

Operational staff of Ignalina NPP performs maintenance during walk down with control condition of equipment and rooms. Also INPP staff carries out the diagnostic activities of system and components, vibration and failures analysis of equipment, which are important to safety. The results of maintenance are the basis to prepare the plans for repair or replace the components, to carry out modifications.

14.2.3. Elements of ageing management programme(s)

The INPP has established and developed ageing management system and prepared ageing management programme according "Ageing Management Requirements of Systems and Elements important to safety of Nuclear Power Facilities, VD-E-05-99". In accordance with VD-E-05-99, the INPP has prepared: ageing management programme of the INPP systems, structures and components; ageing management procedure (QA); methodology for evaluation of the technical conditions and remaining life time of systems, structures and components; procedure for screening of systems, structures and components for the purpose of ageing management; list of the INPP safety related systems, structures and components; schedule of evaluation of the technical conditions and remaining life time of systems, structures and components, which are included in ageing management programme.

The main task of the ageing management programme is to ensure reliable operation of systems and elements important to safety of nuclear power facilities. The INPP prepared ageing management programme ensures performance of following functions: general assessment of ageing process according design documentation requirements; timely assessment of systems and elements condition to ensure reliable operation of nuclear power facilities during design lifetime; timely detection of systems and elements degradation phenomena, including determination of unanticipated causes, their elimination and mitigation of consequences; performance of necessary modifications and change of operation conditions in order to mitigate degradation phenomena; assessment of residual service life of system and elements and planning of necessary measures.

It is continuous work and the INPP constantly provides analyses of the faults, the maintenance and in-service inspections programmes analyses to ensure the reliability of systems and components important to safety and also after final shutdown of the INPP and before decommissioning, a post-service surveillance and testing programme be applied to detect and assess continuing ageing effects. This programme will be continuing as long as particular systems, structures and components of the INPP are required to remain operated and the decommissioning process has not been completed.

14.2.4. Arrangements for internal review by the licence holder of safety cases to be submitted to the regulatory body

Law on Nuclear Safety of the Republic of Lithuania states that the analysis and substantiation of nuclear safety in the area of nuclear energy activities as well as other activities involving nuclear and/or nuclear fuel cycle materials shall be carried out by the applicant or the licence holder; whereas the analysis and substantiation of nuclear safety during the evaluation of the construction site of a nuclear power plant shall be carried out by the persons implementing a nuclear installation project. The results of the analysis and substantiation of nuclear safety shall be independently verified in the manner set out by the Head of the State Nuclear Power Safety Inspectorate. The applicant or the

licence holder shall be responsible for the performance of such independent verification, whereas in case of the construction site of a nuclear power plant evaluation – the responsibility for performance of an independent verification falls on persons implementing the nuclear installation project design.

Nuclear Safety Requirements BSR-1.4.1-2010 “Requirements for management system” states that licence holder shall establish requirements for implementation of the independent verifications, including audits.

License holder is responsible for the performance of independent verification of the documentation of substantiation of modification safety according Nuclear Safety Requirements BSR-1.8.2-2011 “Categories of Modifications at Nuclear Facilities and Procedure Regulations for Making these Modifications”.

14.2.5. Regulatory review and control activities

Law on Nuclear Energy of the Republic of Lithuania states that VATESI shall analyse and assess the documents submitted by applicants for obtaining a licence or a permit, also the documents submitted by licence holders or permit holders or other persons, shall adopt relevant decisions regarding such documents, shall review and evaluate the nuclear safety.

Regulatory review and control activities of the performance of licensed or permitted activities and evaluation of nuclear installations safety as well as safety of operations with nuclear and/or nuclear fuel cycle materials are comprised of: review, evaluation and agreement of nuclear safety documents submitted by the licence or permit holders and inspection activities.

The Head of VATESI has appointed permanent authorised employees who in the manner set out by the Head of VATESI, shall regularly supervise all stages of a nuclear installation lifecycle at its construction site. VATESI inspections are conducted at all stages of the lifetime of a nuclear facility: during the evaluation of a construction site for nuclear facility, its design, construction, commissioning, operation or decommissioning stages, as well as in supervising the closed radioactive waste repository, procuring, storing or transporting nuclear and / or nuclear fuel cycle materials and / or dual use nuclear commodities. VATESI inspects applicants for obtaining licensees and permits, licenses and permits holders, suppliers of goods or nuclear fuel cycle materials. Every year VATESI develops a plan of inspections in accordance with the established criteria and with regard to the available human and financial resources. VATESI annual inspection plan involves four general types of inspections, namely Special Inspections, Regular Inspections, Technical Inspections and Control Room operation inspections. In addition to planned inspections as well as unplanned inspections which may be announced or unannounced are performed. Each year the following safety – related areas are inspected: training of the INPP personnel, safety systems and safety-related systems (emergency core cooling system, emergency power systems, fire protection systems, spent fuel pools and their cooling system, service water system and others), management of beyond-design-basis accidents, quality management, management of radioactive waste, safety culture, ageing management, emergency preparedness, assessment of operational experience and others.

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.

15.1. Overview of arrangements and regulatory requirements concerning radiation protection at nuclear installations, including applicable laws

The protection of general public, workers of nuclear facilities and environment from the possible radiation impact is regulated by the laws, norms and standards listed in Annex VI.

The basic standards and safety requirements for occupational and public exposure (including dose limits) are established in HN 73:2001, which is in line with the requirements of Safety Series No. 115, International Basic Safety Standards for Protection against Ionizing Radiation and the Council Directive 96/29/EURATOM of 13 May 1996 Basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation.

The basic regulation, which sets out requirements for radiation protection of workers working at the nuclear facilities, is BSR-1.9.3-2011, which replaced Hygiene Standard HN 87:2002 due to changes in the Law on Radiation Protection regarding transition of radiation protection legislation and supervision competence in the area of nuclear energy to State Nuclear Power Safety Inspectorate (VATESI). The requirements of the BSR-1.9.3-2011 are in compliance with International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, BSS No. 115, Vienna, IAEA, 1996, and 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 arising from ionizing radiation, No L 159, vol. 39.

The radiation protection requirements of outside workers are set in the HN 83:2004. The principal requirement is that the radiation protection of outside workers shall be at the same scale as of permanent workers of the NPP. The employers, whose workers are performing their activities within the controlled area of the nuclear power plant, shall establish the co-operation agreements with license holders, where the order and procedure of registration and estimation of workers exposure, measures of exposure reduction and other significant means from the radiation protection point of view shall be described. The requirements of HN 83:2004 are in compliance with Council Directive of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas (90/641/EURATOM).

The limits for discharges from INPP, the order of permitting of discharges, requirements for radiological monitoring are set in the BSR-1.9.1-2011.

Requirements for radiological environmental monitoring are laid down in the Order of the Minister of Environment “On approval of regulation of environmental monitoring of economic entities”.

15.2. Regulatory expectations for the licence holder’s processes to optimize radiation doses and to implement the ALARA principle

Relying on the European Directive EURATOM 96/29, as well as on the international recommendations, the Lithuanian regulation (the Law on Radiation Protection, Lithuanian Hygiene Standards HN 73:2001 and nuclear safety requirements BSR-1.9.3-2011) clearly refer to the ALARA principle: *any kind of exposure of individuals and society must be as low as reasonably achievable, economic and social factors being taken into account*. There is a regulatory requirement that the optimisation of radiation protection is to be applied, together with the principle of justification of practices and the principle of limitation of individual exposures.

According to the requirements of BSR-1.9.3-2011, one of the items of the radiation protection

programme must be the application of optimisation principle (ALARA) and measures on exposure reduction. For this purpose the optimization programme shall be carried out at nuclear facility. The following principles are considered to be the basis of the ALARA programme:

- Any exposure may be authorized if the assumed advantage is higher than the exposure risk;
- The exposure level shall be as low as reasonably achievable considering all social and economic conditions;
- Certain regulations and instructions shall be to restrict the exposure level in order to make the exposure risk as low as possible.

In order to optimize radiation protection of nuclear facilities workers, when they are performing routine, planned, maintenance, revision and other works at nuclear facility, the measures and procedures for exposure reduction of workers and reduction of amount of generated radioactive materials (reduction of exposure level in workplaces, decrease of surface and airborne radioactive contamination, determination of optimum number of workers, taking into account type of work, use of protective shielding, decontamination, iodine prophylaxis etc.) shall be included in the ALARA programme.

An ALARA programme dedicated to the dismantling of a nuclear power plant shall comprise the traditional phases of prediction, performance follow-up and feedback analysis and also it must allow defining at least:

- Objectives and dose targets for the short, medium and long terms. The rationality behind the choice of such objectives and targets must be clearly stated;
- A radiation dose plan and a dose reduction plan (sources, dose rates and exposure times to be considered), for the different stages of the decommissioning, demonstrating that the doses have been optimised;
- Ways to monitor, follow up and analyse the experience;
- Plans and strategies for extended education and training of the work force as well as organisational aspects of the ALARA programme requirements.

15.3. Implementation of radiation protection programmes by the license holders

To ensure adequate radiation protection of workers during decommissioning of INPP the radiation protection program is established in accordance with the requirements of BSR-1.9.3-2011. Following items are included in the programme:

- classification of working areas and access control;
- local rules, measures of supervision of safety at work and work organisation order;
- procedures of monitoring of workplaces and individual monitoring of workers;
- individual protective equipment and rules for their application;
- main premises, control systems for assurance of radiation protection;
- application of optimisation principle (ALARA) and measures on exposure reduction;
- programs of health surveillance;
- mandatory training of workers and their instructions.

15.3.1. Observation of dose limits, main results for doses to exposed workers

According to the HN 73:2001, the dose limit for the exposure of a worker is 50 mSv a year. In addition it is stated, that the radiation exposure of a person engaged in radiation work is limited so that the added dose does not exceed 100 mSv for the period of 5 years.

Limits of exposure of critical organs determined by HN 73:2001 are presented in Table 15.1.

Table 15.1. Limits of exposure of critical organs determined by HN 73:2001

Equivalent dose in a year	Dose limit	
for the lens of the eye	150 mSv	15 mSv
for the skin	500 mSv	50 mSv
for the extremities (hands and feet)	500 mSv in a year	-

Individual monitoring of personnel exposure at the INPP aims at assessing and ensuring radiation protection of workers in the INPP controlled area, obtaining the information about internal and external exposure doses, timely identification of cases of increased radionuclide content level in organism, and as a proof of the fact that the dose limits are not exceeding both in normal plant operation and in possible emergency conditions.

Individual monitoring of internal and external exposure of the INPP personnel is carried out with the help of the individual dosimetry control computer-based system, which includes:

- Thermo luminescence dosimetry system RADOS;
- Direct-reading electronic dosimetry system RAD-51, RAD-52, RAD-62 (for operative control);
- Gamma spectrometric system WBC ACCUSCAN 2260-G2KG (Whole Body Counter);
- Local net;
- Software support for collecting, storing, processing and displaying the information of individual personnel radiation monitoring from individual dosimetry control system RADOS and WBC ACCUSCAN 2260-G2KG.

Individual monitoring of external exposure of INPP personnel and outside workers is set for a period of one month. If according to the results of operative control total individual dose of worker exceeds 2.0 mSv reading of the TLD dosimeter is performed without delay. The results of individual monitoring of INPP personnel and outside workers for 2010 – 2012 are given in the tables 15.2 and 15.3.

Table 15.2. Exposure and collective dose dynamics of the INPP workers 2010–2012

Year	Collective dose, Man·Sv	Highest individual exposure dose, mSv	Average dose, mSv
2010	0.485	8.87	0.25
2011	0.578	13.78	0.38
2012	0.570	12.57	0.37

Table15.3. Exposure and collective dose dynamics of the outside workers 2010–2012

Year	Collective dose, Man·Sv	Highest individual exposure dose, mSv	Average dose, mSv
2010	0.037	2.95	0.04
2011	0.054	8.56	0.07
2012	0.017	4.67	0.02

In the Figure 15.1 the collective doses of INPP and outside workers from 2002 to 2012 are presented in graphic form.

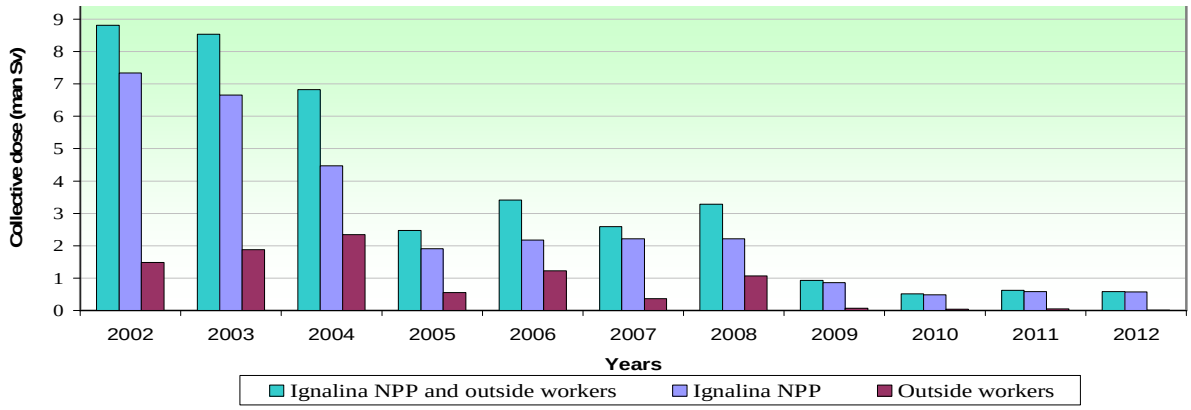

Figure 15.1 Collective doses of the INPP and outside workers from 2002 to 2012.

The annual individual exposure doses at the INPP did not exceed established dose limits. Individual monitoring of internal exposure of INPP personnel and outside workers is conducted by gamma spectrometric measuring system WBC ACCUSCAN with the aim of obtaining the information about internal exposure doses, timely identification of cases of increased radionuclide content level in organism and prevention of fixed annual exposure dose exceeding. Personnel internal exposure control is realized in accordance with the "Time Schedule for Radiation Safety Monitoring at INPP". The values of an effective dose of the personnel internal exposure from 2010 till 2012 are given in Table15.4.

Table15.4. Monitoring results for nuclide content in personnel organisms 2010 – 2012

Year	The internal exposure effective dose of INPP personnel and outside workers, man							Number of people measured with WBC, man
	Less than minimal registration level of WBC (RLWBC=0.001 mSv)	RLWBC-0.1 mSv	0.1-0.2 mSv	0.2-0.3 mSv	0.3-0.4 mSv	0.4-0.5 mSv	0.5-0.6 mSv	
2010	1585	140	22	2	2	–	–	1751
2011	1465	113	10	2	–	–	–	1590
2012	1385	121	11	1	3	1	3	1525

The highest internal exposure value of INPP worker was registered in 2012, which amounted to 0.57 mSv. The highest measured activity of Co-60 radionuclide equals 1216 Bq.

According to the "Program of Monitoring of the Workers and Workplaces Exposure", carrying out of the following kinds of the personnel internal exposure monitoring is foreseen: confirmative, target, regular monitoring prior to the beginning of works, monitoring after the completion of works.

The confirmative monitoring of personnel internal exposure is carried out once a year for all personnel in order to prove that the radiation protection of personnel is ensured and is sufficient. The target monitoring of internal exposure is carried out during and after radiation hazardous works for the INPP personnel and outside workers depending on radiation conditions at working places and results of external exposure individual dose measurement. Regular monitoring of the personnel internal exposure is carried out at least once every 3 months for the workers, whose expected effective annual dose of internal exposure is higher than 0,1 mSv/year according to the results of confirmative monitoring. Monitoring prior to the beginning of works is carried out with the purpose of internal irradiation individual background levels establishment for the personnel who have got a job in the controlled area. Monitoring after the completion of works is carried out with the purpose of estimation of internal exposure dose for the workers upon completion of work in the INPP controlled area at dismissal or transfer of the worker from the controlled area.

15.3.2. Conditions for the release of radioactive material to the environment, operational control measures and main results

Requirements of BSR-1.9.1-2011 limiting discharge of radionuclides into environment are applied in order to protect humans, other living organisms, natural resources (the land, forest, water) and other environmental entities from harmful influence of ionizing radiation and contamination by radionuclides from nuclear installations. The requirements of this document are obligatory to nuclear facilities when designing, constructing and operating them as well as to nuclear facilities during decommissioning. This normative document regulates limiting of discharges of radionuclides into environment from nuclear facilities under normal conditions, including short-time anticipated operational transient, and it is not applicable for accidents.

According to the BSR-1.9.1-2011 total annual limit values of radionuclide releases to the water and releases to the air should not exceed 0.2 mSv to the public.

Operational control of radioactive releases into the atmosphere at INPP is ensured in accordance with the "Schedule of Monitoring for Ensuring Radiation Safety at INPP". The control of radioactive substance releases into the environment is implemented by the following technical means:

- Automated Radiation Safety Monitoring System SAMRB;
- Laboratory equipment for taking, preparation and specific activity measurement of samples.

15.3.2.1. Operational control measures of discharges to atmosphere and main results.

Automated Radiation Safety Monitoring System SAMRB ensures the control of radioactive releases into the environment by means of the Radiometric Facility PKC-07П. Measurements are made by means of determination of the activity of each controlled environment component in the samples constantly taken into the facility detection units. Limits of authorized discharges from INPP to atmosphere are presented in Table 15.5.

Table15.5. Authorized discharges limits from INPP to atmosphere

Airborne discharges	**Bq/year**
Noble radioactive gases	$5.93 \cdot 10^{15}$
Particulate Pollutant	$1.65\ 10^{13}$
Iodine-131	$2.50 \cdot 10^{10}$

Sampling of air releases for analysis is ensured by means of the sampling device fit into the air medium pipes. The sampling device faces the flow. Samples are taken from the central area of the flow. Gas and aerosol media are delivered to the place of sampling by the sampling routes made of stainless steel. Laboratory control is based on the stationary and portable sampling equipment, as well as on the stationary radiometric and spectrometric equipment. Discharge rates of noble radioactive gases, radioactive aerosols and iodine-131 from INPP during period 2010-2012 are presented in Table 15.6.

Table 15.6. Discharges of noble radioactive gases, radioactive aerosols and iodine-131 from INPP

Year	**Noble radioactive gases, 10^{12} Bq**		**Radioactive aerosols, 10^{7} Bq**		**Iodine-131, 10^{7} Bq**	
	Sum	% from DL*	Sum	% from DL	Sum	% from DL
2010	1.95	0.033	3.97	0.00024	1.58	0.063
2011	0.00	0.00	3.12	0.00019	0.00	0.00
2012	0.00	0.00	4.577	0.00028	0.00	0.00

*DL – Discharge limit.

No exceeding of limits in discharges was fixed.

Radiometric measurements of the specific activity of air releases are carried out with the help of devices which use the Geiger-Mueller meters and scintillation detectors as a detector. Pulse amplitude analyzers together with semiconductor detectors are used for determination of radionuclide composition of air releases.

15.3.2.2 Operational control measures of discharges to water and main results.

Radiological monitoring of the environmental contaminants, removed by the waterway, at INPP is carried out in accordance with the "Environmental Monitoring Programme". The facilities for monitoring of pollutant discharges into the reservoir-coolant are the service water intake channel, service water discharge channel, INPP industrial site industrial and storm water sewage system.

The periodicity of taking samples from the intake and discharge channels – everyday, from the industrial and storm water sewage system – 3 times a month. The control of radioactive substance discharges into the reservoir-coolant is ensured by means of application of the laboratory equipment for taking, preparation and the specific activity measurement of samples.

Water samples for the analysis are taken by the EML laboratory assistants-radiation measurement operators with the help of sampling vessels. Samples are delivered to the EML by the EML laboratory assistants-radiation measurement operators using vehicles. The taken samples are measured by means of the following spectrometric and radiometric equipment:

- gamma spectrometers CANBERRA with semiconductor detectors CANBERRA made of especially pure germanium with software GENIE 2000;
- alpha spectrometer ORTEC Octete Plus with 8 measurement vacuum cells, with model BU-020-450-AS silicon detectors;
- liquid scintillation spectrometer TRI-Carb 2770 Tr/Sl (for measurement of H-3 content in the water);
- low background gas flow beta radionuclides counter RISO GM 25.

The key gamma nuclides defining the activity of discharge to water were: Cs-137 (`~39%) and Co-60 (~60%). The permissible maximal release to water is $8.82 \cdot 10^{14}$ Bq/year. No exceeding of limits in discharges was fixed. Discharge rates of gamma nuclides into environmental water from INPP during period 2010-2012 are presented in Table 15.7.

Table 15.7 Discharges of radionuclides into environmental water from INPP

Year	**Discharges, 10^{10} Bq**	**Discharges of gamma nuclides, 10^{7} Bq**
2010	1.81	4.16
2011	2.24	1.82
2012	2.11	0.51

Considering the Sr-90 and H-3 radionuclides are widely spread in the ecosystem and in the lake Drūkšiai, it is impossible to identify their ingress with the process water, as their concentration in the water of both the intake and discharge channels is practically the same and is equal to the detection limit of the measurement equipment (0.007 Bq/l for Sr-90 and 3 Bq/l for H-3).

Using INPP monitoring data regarding airborne discharges and discharges into the lake Drūkšiai doses for critical group of public during normal operation of INPP were evaluated. Annual dose for critical group of public during normal operation of INPP did not exceed dose constraint value (0,2 mSv):

- in 2010 –$6.82 \cdot 10^{-6}$ mSv and $8.27 \cdot 10^{-5}$ mSv due to the airborne and liquid discharges respectively, in total $8.95 \cdot 10^{-5}$ mSv per year;
- in 2011 – $2.75 \cdot 10^{-5}$ mSv and $3.36 \cdot 10^{-5}$ mSv due to the airborne and liquid discharges respectively, in total $6.10 \cdot 10^{-5}$ mSv per year;
- in 2012 – $1.29 \cdot 10^{-5}$ mSv and $0.75 \cdot 10^{-5}$ mSv due to the airborne and liquid discharges respectively, in total $2.04 \cdot 10^{-5}$ mSv per year.

15.3.3. Processes implemented and steps taken to ensure that radiation exposures are kept as low as reasonably achievable for all operational and maintenance activities

Implementation of the ALARA Programme at the INPP was started in 1996. The aim of the ALARA Programme at INPP for 2010–2012 is to make the personnel exposure dose as low as reasonable achievable and to provide maintaining of individual exposure limit within 20 mSv/year for 5 years, as well as to reduce the personnel collective annual dose.

The ALARA Programme has the following basic directions at the INPP:

- Proper organization of the activities;
- Improvement of working conditions and Personnel learning and training;
- Perfection of engineering process;
- Quality maintenance and Safety culture;
- Human factor impact.

ALARA principles are applied and adapted at all stages of decommissioning activity related to radiation exposure. Since 1997 INPP has been implementing the Quality Assurance Program. The procedures of the first and second levels have been prepared and their main purpose was the implementation of the ALARA Program at the INPP.

Responsibility for radiation protection is sharply defined at the INPP in accordance with a Control Procedure of the second level “Radiation Safety” QA 2-005.

Director General is responsible for policy making in the field of radiation protection at INPP, distribution of authority and allocation of responsibility, implementation ALARA foundations at INPP as well as financing of radiation protection activity.

Heads of Departments and Services are responsible for organisation of activities on INPP radiation protection according to ALARA rules, standards and principles.

Heads of divisions are responsible for organisation of activities on radiation protection in their divisions in accordance with rules and standards, for training and professional skills of their stuff, for making such working conditions when personnel exposure doses will be maintained as low as reasonable achievable.

Head of the Radiation Protection Service is responsible for work of the Service workers, their qualification, supply of resources, control of implementation of radiation protection standards and instructions, control of implementation of correction measures in case of inconsistencies.

Head of the Radiation Protection Division is responsible for preparation and review of procedures for establishment of types and levels of impact on radiation protection, implementation of radiation monitoring, control of implementation of radiation protection standards.

Head of the Maintenance and Quality Management Division is responsible for organisation and conducting of audits on radiation protection activity as well as coordination and corrective actions in this document.

Every worker is responsible for fulfilment of radiation protection requirements.

The staff that works in radiation exposure conditions is trained according to the programs on radiation protection preparation in the INPP Training Centre.

Radiation protection skill content is included in a worker’s Job Description as well as a program for a post preparation. The course duration is 30 hours for workers dealing with the ionising exposure sources and 60 hours for those responsible for radiation protection. The personnel engaged in works related to high exposure doses shall undergo additional training course before they can start working. The training is arranged on a regular basis, and special training simulators are applied. Outside workers are also trained and examined on radiation protection according to the same programs in the INPP Training Centre before they are left for work in a controlled area. Radiation protection and ALARA foundation training is realized in accordance with a Control Procedure QA-2-014.

According to the Nuclear safety regulations BSR-1.9.3-2011 the INPP territory and its premises are divided into the controlled area and the supervised area. The premises in the INPP controlled area are subdivided into three categories according to their radiation conditions, see Table 15.8.

Table 15.8. Classification of INPP controlled areas

Room category	Colour of the area	Frequency of service	Dose rate mSv/h	Surface alpha contamination $Bq \cdot cm^{-2}$	Surface beta contamination $Bq \cdot cm^{-2}$	Total aerosol activity $Bq \cdot cm^{-3}$
I	Red	No service	>56	>20	>266	>1110
II	Yellow	Periodic	12-56	4-20	40-266	185-1110
III	Green	Permanent	<12	<4	<40	<185

The first category premises are unmanned ones. The doors of category I rooms are painted by red colour and in addition are tagged by signs of radiation danger. The access to the room is authorised under the orders, written orders or special programmes approved in accordance with the established procedure with the permission of the Shift Supervisor or Radiation Safety Control dosimetrist.

The second category premises are those, the entrance into which is only permitted for periodic maintenance of the equipment located in them (Central Hall, a Spent Fuel Storage Pools Hall, a sample cutting room). The doors of these rooms are painted by yellow colour and in addition are tagged by signs on radiation danger. The access to the specified rooms is authorised according to INPP valid procedures.

The third category premises are those of personnel permanent residence (for example, operator rooms, control panels, workshops, laboratories, corridors, etc.). Doors of these rooms are tagged by a sign with green labels. The requirements for the colour of the doors are not imposed.

The access to the premises, which under any radiation factor are related to categories I or II, is strictly regulated. The works in these premises are carried out in the following order:

- people responsible for radiation protection shall assess the radiation condition of working places and develop the principles of requirements to safety;
- operators shall prepare the working place;
- workers get appropriate instructions;
- workers shall be followed by a person responsible for dose monitoring, who assess the radiation conditions.

In order to reduce the personnel expose dose the working area or object is decontaminated before the activities can be started. The activities with increased exposure are usually carried out with the following radiation protection means: lead screens, distance safety equipment, video-monitoring systems.

To provide radiation protection a system of job confirmation procedures has been developed at the plant, a system of permission issue for carrying out of radiation dangerous works is being efficiently used. All activities under ionising exposure conditions are carried out in accordance with “Direction on Radiation Accident Prevention during Work Performance in Controlled Area” requirements.

Medical examination of the personnel who works in a controlled area includes an initial medical examination and a subsequent annual health control. According to the Order No 561 issued by the Ministry of Health the plant personnel shall pass medical examination once a year. In case doctors find any contraindications, this person is not allowed to work with sources of ionising radiation.

15.3.4. Environmental monitoring and main results

In accordance with requirements for radiological environmental monitoring that are laid down in the Order of the Minister of Environment “On approval of regulation of environmental monitoring of economic entities”, the operator of nuclear energy object has to work out the monitoring programme and implement it. Measurements shall be made by the laboratory owned by the subject or any other hired laboratory (or laboratories) possessing the required equipment and qualified personnel

to ensure data quality.

The monitoring programme shall cover all important routes of radionuclide dispersion and population exposure to enable the proper evaluation of annual airborne and water discharges, likewise their short term and consequently doses for critical group members, changes.

Environmental samples shall be taken from the vicinity of release points and from potentially most contaminated (according the radionuclide diffusion calculations and specific circumstances of landscape) places of sanitary protection and monitoring zones.

To evaluate INPP impact to environment and population permanent radiation monitoring is carried out on the INPP site and within a radius of 30 km. Radionuclide concentration measurements in foodstuffs, drinking water and soil have been conducting since the moment the INPP had been put into operation. The investigation data show that the Caesium and Strontium radionuclide activities in foodstuffs and drinking water do not considerably differ from the activity level in other regions of Lithuania and do not exceed those laid out in the Lithuanian normative documents, see Table 15.9.

Table 15.9. Concentration of Cs-137 in the fish and soil in INPP Region in 2010-2012

Name of sample	**Average values in INPP region (Bq/kg)**		
	2010	2011	2012
Fish	0.88	0.92	1.16
Soil	2.88	1.48	1.81

The monitoring of the population exposure in the zone of 30 kilometres is carried out. It was determined that the annual exposure dose of the population does not exceed the fixed limit of 0.2 mSv.

All release pathways at the INPP are monitored. The ventilation stacks of NPP are monitored (activities of noble gases, particles, iodine and aerosol) continuously. The water is checked every time before the content is discharged into the lake and also the water from intake and outlet channel is tested for laboratory measurements every day.

On the site and in the vicinity there are TL dosimeters set out for measurements of accumulated dose, which are evaluated by power plant not less than twice a year. Also, on- line monitors of in-situ dose rate measurement are set around the INPP. The monitor readings permanently can by made available to the authority.

In order to control the influence of the INPP to environment sampling of aerosols and atmospheric precipitation (continuously), water, bottom sediments, grass and other environmental samplings are performed. The results of measurements are reported to the authority.

The automatised system AKRB-06 for control of assurance of radiation protection of workers and environment is in operation at the INPP. System operates in the territory of INPP and in the monitoring area of potential radioactive contamination.

AKRB-06 registers all parameters (levels of radioactive discharges into environment, levels of gamma radiation and air contamination in the INPP rooms, contamination of technological media), characterizing radiological situation in the INPP and environment, for all the modes of operation. Information with signalling or alarming devices is automatically presented to the radiation situation supervision desk by the system of radiation control.

15.4. Regulatory review and control activities

On 1st October 2011 Radiation Protection Law was amended, which resulted the change in the responsibilities and functions of VATESI. The VATESI took over regulatory function of radiation protection of workers in the area of nuclear energy.

VATESI implements supervision and control of the workers and outside workers in the field of radiation protection and carry out analysis of the reports. The licence holder presents the data on the exposure doses of the workers, the discharged amounts to the atmosphere and to the lake water regularly (every month, once per quarter and at the end of the year). At the end of the year, the report

on the influence of the nuclear facilities on the environment is presented.

The functions of control of safety of nuclear facilities are performed by VATESI. In implementing state regulation of nuclear safety, radiation protection, accounting for and control of nuclear materials in the sphere of nuclear energy, VATESI approves standards and rules of operation of nuclear facilities, in those radiation protection issues are always taken into account, and performs surveillance over compliance with radiation protection regulations, standards and procedures during operation and maintenance of these facilities.

VATESI also approves requirements limiting discharges of radionuclides into environment, controls the implementation of these requirements and approves of the submitted plan for radioactive discharges into the environment.

VATESI conducts inspections at nuclear facilities. The implementation of radiation protection requirements during decommissioning of INPP, the management of radioactive waste and spent nuclear fuel, measures for optimization of occupational radiation protection, occupational exposure measurement and results, monitoring of work places and workers' individual exposure, effectiveness of training in radiation protection and other issues important from radiation protection viewpoint are also inspected.

During the inspections it is also assessed how the outside workers follow the radiation protection requirements during their work in the controlled area of INPP and keeps under the control the occupational doses of outside workers as well as the occupational doses of INPP workers.

During the annual inspections implementation of environmental monitoring programme, procedures of operational control of liquid and gaseous discharges from INPP are inspected.

The radiation protection issues during decontamination and dismantling of INPP buildings and equipment and the radioactive waste management, control of occupational and public exposure during the decommissioning of INPP will remain one of the underlying areas of regulatory activities.

The regulatory body coordinating the activities of executive and other bodies of public administration and local government in the field of radiation protection, monitoring and expert examination of public exposure is Radiation Protection Centre (RPC). Among other responsibilities the RPC is responsible for the radiation protection of the general public from negative impact which may cause the ionizing radiation, including ionizing radiation, arising from nuclear facilities in operation and decommissioning.

RPC is regularly assessing exposure for public due to discharges to the atmosphere and water from the INPP. Within the execution of the State Environmental Radiological Monitoring the measurements of radioactivity in the foodstuffs (milk, meat, vegetables, grains, and fish), raw food, drinking water, and mushrooms are performed at schedule approved by Minister of Health Care. Milk and drinking water is analyzed on quarterly basis, fish, meat – twice per year, vegetables, grains, mushrooms – during summer time. Approximately 90 samples of food, 150 samples of drinking water and 50 samples of mushrooms were measured in every year from 2010 up to 2012. Results showed that the levels of manmade radioactivity in the samples analyzed are very low, and their radioactivity levels are the same as in the other territory of Lithuania. External gamma dose equivalent measurements by thermo-luminescent dosimetry in the surroundings of the NPP proved that there is no increase of external dose due to the INPP in this area. Dose due to manmade radionuclides (Sr-90 and Cs-137) for the public estimated on the results of measurements was lower 2 μSv/year. During the last three years dose estimation for the public was performed analyzing results of monthly and annual reports of radioactivity discharged to the environment delivered by the INPP.

The Ministry of Environment approves requirements on radiation protection of environment while EPA controls the implementation of these requirements. EPA provides environmental radiological control within the sanitary protection zone of the nuclear facility. There are four automatic gamma dose rate measurement stations around INPP. There is a station of aerosol sampling in 60 km distance from INPP and operation of the new one in Vilnius was started in 2013. Environment samples are periodically taken within the zone of INPP: water, biota and bottom sediments of the Lake Drūkšiai. Control of INPP laboratory is provided for ensuring of reliability of results.

ARTICLE 16 EMERGENCY PREPAREDNESS

Each Contacting 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.

Each Contacting Party shall take the appropriate steps to ensure that, insofar as they are likely to be effected by a radiological emergency, its own population and competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.

Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be effected 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.

16.1. Article 16(1) – Emergency plans and programmes

16.1.1 Overview of arrangements and regulatory requirements for on-site and off-site emergency preparedness

The main laws that set and describe the general criteria for ensuring on-site and off-site emergency preparedness and response in case of nuclear or (and) radiological emergencies are:

The Civil Protection Law (accepted on 1998, updated on, 2009) establishes the legal and organisational framework for the organisation and functioning of the civil protection system, the competence of state and municipal institutions and agencies, the rights and duties of other agencies, economic entities and residents in the sphere of civil protection.

The Law on Nuclear Energy (accepted on 1996, updated on 2011) sets the general obligations and assigns responsibilities for licence holders and state institutions for preparedness and response to nuclear or (and) radiological emergencies at nuclear facilities. This law sets the order of preparation and approval of the state plan for protection of population in case of a nuclear accident.

The Law on Nuclear Safety (accepted on 2011) sets responsibilities for license holders to ensure the preparedness for possible nuclear and radiological accidents, their prevention in nuclear installations and in shipping nuclear and/or nuclear fuel cycle materials. This law sets the obligation for license holders to prepare an on-site emergency preparedness plan.

The arrangements for ensuring the off-site preparedness and response to nuclear or (and) radiological emergencies are:

National Plan for Protection of Population in case of Nuclear Emergency (hereinafter - Plan) at the State level defines civil protection actions in case of a nuclear emergency in Lithuania and (or) outside of it's borders. The general objectives of emergency planning are to prevent serious deterministic health effects and to reduce the likely stochastic health effects of ionizing radiation. The Plan assigns the responsibilities of state institutions taking part in emergency preparedness, provides means of protecting the population. The plan sets arrangements for co-ordination of actions taken over by ministries, other State Administration institutions, municipal authorities, describes the early notification of neighboring countries, EC, IAEA, etc. The Plan is prepared in accordance with IAEA Requirements No. GS-R-2 "Preparedness and Response for a Nuclear or Radiological emergency" and IAEA Safety Guide GS-G-2.1 "Arrangements for Preparedness for a Nuclear or Radiological Emergency".

Hygiene Standard HN 99:2011 "Protective Actions of Public in Case of Radiological or

Nuclear Emergency" adopted by the Order of the Minister of Health on December 7, 2011, implements IAEA General Safety Guide No. GSG-2 "Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency". Hygiene Standard HN 99:2011 establishes Generic criteria for acute doses to avoid or to minimize severe deterministic effects; Generic criteria for protective actions to reduce the risk of stochastic effects; Operation intervention levels (OIL) for environmental measurements, skin contamination, food, milk, drinking water; procedures on administration of stable iodine, clean-up procedures and dosimetric control of contaminated population, etc. This Hygiene Standard is a basis for application of public protective actions.

There are other normative legitimate acts which, inter alia, cover emergency preparedness issues such as HN 73-2001, etc. Numerous legitimate acts regulating specific fields exist at the district and local levels.

Governmental Resolution No. 578 "On the approval of general provisions of dosimetric control in case of radiological accident" approved by the Government of the Lithuania on 12 May 1998 is the main document coordinating dosimetric control of the workers, population and environment. In case of a radiological accident dosimetric control should be organized and carried out according to this Resolution and following to the approved instructions of the Fire protection and rescue services. Radiation Protection Centre and Environmental Protection Agency under the Ministry of Environment are responsible institutions for organizing, coordinating and control of dosimetric procedures within the limits of its competence. The procedure of stockpile, storage, renewal and usage of the national reserves of civil protection means is defined by the Law State Reserve, approved by Seimas on 31 August 2000.

Criteria of The Emergency Events approved by Government of Republic of Lithuania on 24 August 2011, defines a list of emergency events which can lead to an emergency situation. It also includes criteria for radiological accidents.

The main arrangements for ensuring the on-site preparedness and response to nuclear or (and) radiological emergencies at nuclear facilities are:

General Regulations BSR-2.1.2-2010 "For Ensuring Nuclear Safety of Nuclear Power Plant with RBMK-1500 Reactors, approved by the order of VATESI Head No 22.3-16 in 2010 set the objectives, guidelines, principles and the main safety criteria for nuclear facilities operating RBMK-1500 type reactors. This document puts the obligation for operator of nuclear facility to make analysis and prepare the list of possible beyond design accidents which may lead to severe reactor core damage or melting. The BSR-2.1.2-2010 sets the requirement for operator to prepare the emergency preparedness plan taking in account the analysis of possible severe beyond design accidents. Emergency preparedness and response requirements for the operators of nuclear facilities, issued on 24 October, 2008 by order Head of VATESI, set the main requirements for the nuclear facilities emergency preparedness. The Requirements oblige the operator of nuclear facility to assure prevention of accidents and incidents and, in the event of an accident, to perform the emergency preparedness tasks without delay. This document requires the operator of nuclear facility to develop the Emergency Preparedness Plan complying with these Requirements. This document is based on IAEA requirements GS-R-2; GS-R-2.1 and Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency (TECDOC-953 update).

16.1.2. Overview and implementation of main elements of national plan (and regional plan, if applicable) for emergency preparedness, including the role and responsibilities of the regulatory body and other main actors, including State organizations

The Civil Protection and rescue system is comprised off the Government of Lithuania, the Government Emergency Commission, the Ministry of Interior, the Fire and Rescue Department under the Ministry of Interior, the State Emergency Operation Centre, Ministerial, other state and municipal civil protection offices, fire protection offices, searching and rescue groups, other territorial offices involved in warning, rescue, support to and evacuation of the population.

National management of emergencies is carried out on two levels: state (governmental) and municipal. The state level comprises the Government of the Republic of Lithuania, the Government

Emergency Commission, the State Emergency Operation Centre, ministries, other governmental institutions, including VATESI and FRD.

The municipality level comprises the Municipal Administration, the municipal Emergency Commissions, the Municipal Emergency Operations Centre, the Fire Protection Services, the Population Warning and Notification Services, as well as other institutions, economic entities. Preparations for likely emergencies are carried out by means of planning related activities on each level of the civil protection system.

The Civil Protection and rescue system comprised of three preparedness levels:

- First (ordinary) level – the subjects of civil protection system implements preventive civil protection measures defined in approved strategic, annual plans and regulations of public and municipal institutions.
- Second (reinforced) level – the subjects of civil protection system are in readiness mode to activate full preparedness for emergency situations control.
- Third (full preparedness) – the subjects of civil protection system are ready to respond to an emergency. Human and material recourses are invoked, Emergency Response Centres and Emergency Commissions are activated, stockpile and storage of the national reserves of civil protection means are prepared to be used.

Detailed responsibilities and functions of response institutions are provided in the National Emergency Management Plan (all hazards plan) and in the National Plan for Protection of Population in case of Nuclear Emergency (off-site plan).

The Fire and Rescue Department is competent authority that regulates and coordinates the state civil protection system in the country, controls the way the civil protection system is functioning, organizes operation of State Emergency Operations Centre during emergency situations, organizes and conducts civil protection exercises at national level, organizes fire fighting operations, rescue of people and property, organizes notification and provides information to public.

The Ministry of Energy is responsible for coordination of emergencies prevention, emergencies liquidation and investigation, elimination of emergency consequences at national level.

Administrations of municipalities of Ignalina, Zarasai and Visaginas regions are responsible for development of plans for evacuation and temporary inhabitation for affected population.

VATESI is responsible for collecting information about situation in the nuclear facilities, analyzing and forecasting the development of the situation and predicting possible emissions and pathways of radioactive materials, providing information and advice to the Government, Fire and Rescue Department, Ministry of Environment and Radiation Protection Centre, providing information and consulting the Government Emergency Commission, providing information to the mass-media and public about the situation in the nuclear facilities, notifying European Commission, IAEA, neighbouring countries in accordance with the Convention on early notification and bilateral agreements.

Radiation protection centre is responsible for providing the recommendations to the State or Municipal Emergency Commission, to the State or Municipal Operation centre for the reduction of exposure doses and prevention of deterministic and stochastic effects of radiation on the public and emergency workers. RPC performs analysis of foodstuffs, drinking-water and other samples, contaminated by radionuclides, and presents recommendations to the Ministry of Health for approval of foodstuffs and their raw materials, drinking-water, feeding stuffs temporary maximum permissible levels of radioactive contamination for the emergency consequences liquidation period, organizes supervision and control oh their compliance, RPC also presents proposals to the Ministry of Health on the necessity of applying iodine prophylaxis and provides information to the public, within the limits of its competence, about protection actions.

In the event of a nuclear accident in the INPP, ministries and governmental authorities are engaged to execute the functions carried out by the ministries and governmental authorities in their daily routine. Concerning the FRD it means: organization of warning, fire protection and rescue and

public information and inspection of contaminated territory. In the case of emergency actions of ministries and government authorities shall be coordinated by the Government Emergency Commission, which is comprised of ministerial and governmental officers entitled to decisions making. Operation body of the Government Emergency Commission is the State Emergency Operations Centre comprised of ministerial officers and the headquarters of the FRD.

In the event of an emergency the State Emergency Operations Centre shall:

- Manage rescue operations and liquidation of consequences of the general emergency, aggregate the existing national forces and material resources, if the accident covered territories of more than three Municipalities;
- organize aggregation and co-ordination of assistance required for rescue operations and liquidation of the consequences of the emergency;
- if necessary, prepare and submit the Government proposals and drafts of decisions related to liquidation of the consequences of the emergency, organization of related operations and provision of assistance;
- prepare and submit the Government a report on material resources required for liquidation of the consequences of the emergency and proposals concerning compensations to victims;
- inform the general public on the accident and related actions according to issues delegated under authority of the Government Emergency Commission.

In the event of an emergency the personnel of the INPP shall inform about emergency in the NPP and the existing situation in compliance with approved scheme for preliminary information on a radiation emergency in the INPP. Such kind of notices shall be given to: municipalities situated in the zones of preventive and urgent protection measures and administration of territorial units in neighbouring countries: Daugavpils Region in Latvia and Braslau Region in Belarus.

FRD shall pass information on the emergency to the ministries, municipalities of cities/towns. For this purpose it shall use automatic system for the national managing bodies and warning of the population, public means of communication (subscribers' telephone, fax for general purposes) and direct telephone and radio communication channels additionally arranged by FRD. In addition, the FRD also transmits information on the emergency to state civil protection management bodies in the neighbouring countries. International notification and information issues lay on VATESI.

In order to minimize the consequences of an emergency, a number of preventive measures against radiation effects are prepared: prevention of the population from being exposed to radioactive release in open areas by means of providing shelters or staying at home, application of individual prevention measures, evacuation, limitation or prohibition of consumption of contaminated foodstuffs, regulation of the population entering the contaminated zones, elementary cleaning of contaminated foodstuffs, organization of health care, deactivating of the contaminated area.

Radiation surveillance in the contaminated area is arranged and actively implemented during early phase of a nuclear accident. As for the late phase, radioactive contamination is constantly observed, while inspection of radiation is carried out only if this is required. Radiation surveillance is planned and coordinated by the RPC on the basis of information provided by administration of the INPP on characteristics of the accident, dose metric data, forecasts of Hydro meteorological Service, needs and recommendations of the Ministry of Environment, Ministry of Health Care and other authorities. First of all radiation surveillance is to be carried out in the zone of 30 km in four different routes. In case there is a need FRD also has a capability to make additional reconnaissance of contaminated area.

Decisions concerning regular prophylactic application of iodine preparations in the event of an emergency in the INPP shall be made by municipal Emergency operation centres. Population in the zones of long-term protection measures (in radius of 50 km from the INPP) shall be supplied with stabile iodine preparations in advance by local municipalities of cities and regions. The latter shall acquire such preparations on their own account, consequently distributing iodine preparations for the

population and replacing them prior to the date of expiration.

The remaining population of the Republic of Lithuania shall by themselves acquire regular iodine preparations and ensure their stocks in advance. Iodine preparations should be supplied to drugstores enabling the population to acquire them for regular usage.

In the event of the general emergency in the INPP a decision to evacuate the population exposed to radioactive contamination as well as the process of evacuation itself shall be managed on the municipal level by director of Municipal Administration or at highest level by a head official for civil protection operations assigned by the Prime Minister. Proposals concerning evacuation shall be given by municipal emergency operation centres on the basis of the situation analysis and likely future forecasts.

Evacuation might be implemented in the urgent procedure, if a territory has already been contaminated, or in the planned procedure through population collecting posts, taking into consideration a particular situation and specific features of the area. In the event of urgent evacuation from the territory contaminated with radioactive materials, the population is evacuated right from their places of residence or/and work. The population collecting points serve for evacuation of people from the territory, which, according to forecasts, might be contaminated with radioactive materials and therefore might be dangerous for work or living. Taking into consideration meteorological conditions (direction of the wind), evacuation might be carried out in three directions.

In the early phase of the accident, what is of the most importance is sanitary cleaning of the population, deactivation of transport modes, buildings and roads. Initial sanitary cleaning of the population shall be carried out in the interim evacuation posts. If the level of radioactive contamination detected in clothes and footwear of the evacuated population is within the permitted limits, further sanitary cleaning shall be carried out in the places provided for acceptance and settlement of the evacuated individuals. In the event of higher level of contamination of the evacuated population and being it impossible to carry out sanitary cleaning in intermediate evacuation point, the evacuated individuals might be asked to get off and be provided with uncontaminated cloths from the state reserve for civil protection measures. Sanitary cleaning of the evacuated individuals shall be carried out in the places of their acceptance and settlement by means of showers existing in hostels, sports halls and other places.

16.1.3. Implementation of emergency preparedness measures by license holders

In order to protect the personnel of INPP, people of the Republic of Lithuania against potential consequences of nuclear and radiological emergencies, the INPP carries out emergency planning and emergency preparedness activities.

Emergency planning process at the INPP includes:

- analysing potential emergencies and assessing their consequences to the personnel, people and environment taking into account the worst-case consequences;
- establishing the Emergency Preparedness Organization (hereinafter EPO) capable of eliminating potential emergencies and their consequences;
- permanent monitoring the operability of the technical means ensuring accident prevention, their localization and elimination;
- accumulating the material and technical recourses required for the EPO functioning;
- maintaining continuous preparedness of the Accident Management Centres (hereinafter AMC) and training the personnel of EPO headquarters, services and teams, and the personnel not involved in the EPO services;
- developing the documents prescribed by VATESI and recommended by IAEA;
- timely updating the INPP Emergency Preparedness Plan (hereinafter EPP) with due consideration of the full-scale exercises results as well as results of inspections conducted by VATESI, the Fire and Rescue Department (hereinafter FRD) under the Ministry of the Interior, and other state management and control institutions.

Director General of INPP is in charge of emergency preparedness and planning at the enterprise

through the Manager of Fire Surveillance and Civil Protection Group of Audit, Safety and Quality Management Division.

The EPO structure at the INPP, including the EPO headquarters, services and teams of emergency preparedness and their subordinate personnel are formed on the basis of the functional principle from the personnel of departments, services, workshops and divisions taking into account the specific functions performed by the divisions of the enterprise during their decommissioning.

In order to maintain continuous EPO preparedness, there are at least 2 specially trained persons for each position of head of EPO services and teams, who meet the requirements for this position. The EPO personnel are continuously trained to meet the requirements for those positions.

16.1.3.1. Classification of emergencies

The following accident classes are defined at INPP:

Alert – a nuclear facility status involving failures resulting in significant or unknown degradation of nuclear facility safety. At the accidents of this class EPO shall be put into the state of readiness and additional assessment of the situation shall be performed.

Local Accident – failures in the operation of nuclear facility resulting in:

- release of radioactive materials beyond the normal operation limits within the controlled area;
- considerable decrease in the level of protection provided to the core or spent fuel;
- any additional failures in the operation, which may result in the core or spent fuel damage.

At the accident of this class measures shall be taken to perform protective actions off-site the nuclear facility and to limit radiation exposure to the nuclear facility personnel.

General Accident – failures in the operation of nuclear facility resulting in release or potential risk of radionuclides release beyond the controlled area of nuclear facility requiring urgent protective actions. These failures include actual or projected damage to the core or large amounts of spent fuel and releases of radionuclides beyond the controlled area in doses exceeding intervention levels for urgent protective actions.

After declaration of General Accident urgent performance of protective actions is required in the area of preventive protective measures and preparation for performance of these measures in the area of urgent protective measures is required, with the consideration of environment contamination level.

In case of declaring an accident of this class urgent protective actions are recommended for the public residing in the vicinity of the plant. Accidents at INPP are classified in accordance with the Instruction for Classification of Accidents at INPP. In the event of an accident protective actions shall be applied according to the following criteria:

- arranged in advance to allow for immediate actions;
- measured by the devices used at work;
- understandable and based on the international recommendations.

At the beginning the decision to apply protective actions is based on the class of accident, and then the necessity of performance of protective actions is reviewed on the basis of environment monitoring results. The decision to apply protective actions is based on the Operation Intervention

Levels (OIL). There are six Operating Intervention Levels in the Republic of Lithuania that are regulated by the Lithuanian Hygiene Standard HN 99:2011 “Population Protection Plan in the Event of a Radiological or Nuclear Accident” and that correspond with the Generic Assessment Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA.

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- release of radioactive materials beyond the normal operation limits within the controlled area;
- considerable decrease in the level of protection provided to the core or spent fuel;
- any additional failures in the operation, which may result in the core or spent fuel damage.

At the accident of this class measures shall be taken to perform protective actions off-site the nuclear facility and to limit radiation exposure to the nuclear facility personnel.

General Accident – failures in the operation of nuclear facility resulting in release or potential risk of radionuclides release beyond the controlled area of nuclear facility requiring urgent protective actions. These failures include actual or projected damage to the core or large amounts of spent fuel and releases of radionuclides beyond the controlled area in doses exceeding intervention levels for urgent protective actions.

After declaration of General Accident urgent performance of protective actions is required in the area of preventive protective measures and preparation for performance of these measures in the area of urgent protective measures is required, with the consideration of environment contamination level.

In case of declaring an accident of this class urgent protective actions are recommended for the public residing in the vicinity of the plant. Accidents at INPP are classified in accordance with the Instruction for Classification of Accidents at INPP. In the event of an accident protective actions shall be applied according to the following criteria:

- arranged in advance to allow for immediate actions;
- measured by the devices used at work;
- understandable and based on the international recommendations.

At the beginning the decision to apply protective actions is based on the class of accident, and then the necessity of performance of protective actions is reviewed on the basis of environment monitoring results. The decision to apply protective actions is based on the Operation Intervention Levels (OIL). There are six Operating Intervention Levels in the Republic of Lithuania that are regulated by the Lithuanian Hygiene Standard HN 99:2011 “Population Protection Plan in the Event of a Radiological or Nuclear Accident” and that correspond with the Generic Assessment Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA.

16.1.3.2. Main elements of the on-site and, where applicable, off-site emergency plans for nuclear installations, including, availability of adequate resources and authority to effectively manage and mitigate the consequences of an accident

The INPP Emergency Preparedness Plan is the main procedure to follow during organizational, technical, medical, evacuation and other activities in order to protect the personnel and the environment from consequences of accidents, natural disasters and man-made impacts.

The EPP requirements apply to the EPO managers and personnel, as well as to the personnel not involved in the EPO services and to the contractors’ personnel working at INPP. Documents used to develop the EPP are listed in Annex VII.

The EPP consists of general part with appendices and operational part. The EPP general part with appendices contains:

- policy, goals and objectives specified by the INPP management for the EPO;
- responsibility of the INPP management for emergency preparedness;
- the EPO structure;
- functions of EPO services and units at the INPP;
- the EPO notification and preparedness at the INPP;
- actions to be taken in the event of an accident at the INPP;
- premises and technical means necessary for execution of emergency preparedness functions;
- interaction with local and territorial state management and control institutions for support in the event of an accident;
- resources available at the enterprise in the event of accident;
- radiation dose limits;
- organizational order of emergency preparedness training for the personnel of headquarters, services and teams of the EPO as well as personnel not involved in the EPO.

Appendices:

- list of managers of the EPO headquarters;
- the EPO structure diagram;
- decision-making block diagram;
- time-schedule for major actions on elimination of accidents and their consequences;
- criteria for application of protective actions;
- quantity, storage and delivery locations of emergency FFP3 respirators in divisions of the INPP;
- general criteria for classification of events according to the INES scale;

EPP operational part contains:

- Description of Emergency Preparedness Management Procedure at INPP;
- Description of Scenarios of Potential Beyond Design Basis Accidents at INPP;
- Emergency Planning Instruction at INPP;
- Instruction for Classification of Accidents at INPP;
- Instruction for organization of INPP emergency preparedness exercises, trainings and drills;
- Instruction for Notification and Assembly of the EPO Headquarters Management in the Event of an Accident at INPP;
- Instruction for Organization of Activities of the EPO Headquarters Management in the Event of an Accident at INPP;
- Instruction for Actions of INPP Personnel in the Event of an Accident when Notified by the EPO Headquarters;
- Instruction for Interaction of EPO of INPP with Emergency Services when Eliminating Accidents and their Consequences;
- Plan of the Visaginas Fire and Rescue Board on Elimination and Management of Extreme Events;
- instructions for 5 services of emergency preparedness.

EPP applies to:

- the EPO headquarters management and support group under the EPO headquarters;
- personnel of the EPO services and teams;
- enterprise personnel (not involved in the EPO);

- officers of Visaginas Fire and Rescue Board of the FRD under the Ministry of the Interior;
- officers of the INPP Guards Unit of State Border Guard Service at the Ministry of the Interior;
- officers of Police Department of Visaginas;
- personnel of "Visagino ligoninė" (Hospital of Visaginas);
- personnel of UAB "Ambulansas", emergency ward of Visaginas;
- personnel of "Visagino energija" (Energy of Visaginas);
- personnel of joint-stock company "Lietuvos dujos" (Gas of Lithuania);
- administration of Visaginas municipality;
- contractors' personnel working at the INPP;
- personnel sent on business trips.

The actions covered by EPP shall be carried out within the INPP controlled area. The EPP shall be agreed with VATESI and other institutions of state management and surveillance.

EPP shall be updated every three years. The Manager of Fire Surveillance and Civil Protection Group of Audit, Safety and Quality Management Division of INPP is responsible for updating of EPP.

In response to the events at Japan's Fukushima Daiichi Nuclear Power Plant, the stress tests were conducted in 2011 – 2012 at INPP according to ENSREG stress tests specification. Within the scope of the stress tests, issues related with emergency preparedness of INPP, including severe accident management strategies were reassessed. On the basis of conducted stress tests several safety improvements measures associated with improvement of emergency preparedness and development of accident management at INPP were included in the INPP prepared plan of the stress tests safety improvement measures. More information on stress tests conducted in Lithuania and their results are presented in section S.1. of this report.

The EPP was supplemented with:

- Instruction. Manual on manage of beyond design basis accidents RUZA-B. Manage of state of the INPP Units 1, 2 spent fuel pools, DVSed-0812-3;
- Instruction on emergency cooling of Unit 2 reactor under total loss of the INPP service power supply, DVSed-0812-8;
- Instruction. Manual on manage of beyond design basis accidents RUZA-R1. Cooling of the INPP Unit 2 reactor, DVSed-0812-7;
- Instruction. Manual on manage of beyond design basis accidents RUZA-RB.

16.1.3.3.Facilities provided by the licence holder for emergency preparedness

The management of beyond design basis accidents is carried out from the Accident Management Centre of EPO which is the facility of protected premises aimed for operation of headquarters, representatives of EPO services, and representatives of Visaginas Fire and Rescue Board and INPP Guards Unit. The EPO Accident Management Centre is equipped with all equipment, computers, software, managerial aids, furniture and communication means required for accidents management and communications. The EPO Accident Management Centre is equipped with the spare Technical Support Centre (hereinafter TSC) for work of experts in case the main TSC located on the main building is out of action.

Premises of Technical Support Centre (the main and spare) are provided with the computers, software, managerial aids and furniture required for work of experts.

Premises for the operations personnel designed for accident management:

- Unit Control Rooms 1 and 2 – main unit control rooms;
- Redundant Control Room 2 – remote Unit 2 scram and cooling control board;

- Central Control Room for the INPP electrical part;
- Radiation Protection Main Control Board;
- Environmental laboratory (redundant radiation control board).

16.1.4. Training and exercises, evaluation activities and main results of performed exercises including lessons learned

Once per five years Director General as the EPO Head, or the Decommissioning Department Director (Head of EPO Operations) as a person regarding emergency preparedness and civil protection, designated by Director General of INPP, is trained under a programme of induction training on civil protection for managers (or their designated persons) of facilities of state importance in the Civil Protection Training Centre of the FRD under the Ministry of the Interior. Director General conducts full scale exercises once per three years.

Once per five years Deputy Director of Decommissioning Department as the Deputy Head of EPO Operations and the Head of Emergency Technical Service of EPO as well as Decommissioning Department Director (person, designated by the Director General of INPP on issues related to emergency preparedness and civil protection) or Director General are trained under a programme of induction training on civil protection for managers (or their designated persons) of facilities of state importance in the FRD Civil Protection Training Centre under the Ministry of the Interior.

Once per five years the Fire Surveillance and Civil Protection Group Manager of Audit, Safety and Quality Management Division as the Head of EPO headquarters, and the Civil Protection Engineer of Audit, Safety and Quality Management Division as the Assistant Head of EPO headquarters are trained under a training programme for regular employees on civil protection and emergency preparedness in the FRD Civil Protection Training Centre under the Ministry of the Interior.

Fire Surveillance and Civil Protection Group Manager of Audit, Safety and Quality Management Division in compliance with the approved training schedule of 2-6-hours training programme conducts annual theoretical practice on emergency preparedness and civil protection in the main office of Accident Management Centres for the members of 7 training groups, which include the managers of the EPO headquarters, EPO services and teams managers, EPO services and teams personnel, as well as personnel not involved in the EPO.

Fire Surveillance and Civil Protection Group Manager of Audit, Safety and Quality Management Division conducts group (staff) exercises for the managers of EPO headquarters in the main office of Accident Management Centres, where the skills of management, localization and elimination of beyond design basis accidents are trained.

Civil Protection Engineer of Audit, Safety and Quality Management Division in compliance with the approved training schedule of 2-6-hours training programme conducts annual theoretical practice on emergency preparedness and civil protection in the class of Accident Management Centres for the members of other 8 training groups, which include EPO groups and teams personnel and personnel not involved in the EPO.

At least once per year Civil Protection Engineer of Audit, Safety and Quality Management Division together with the managers of EPO teams trains their beyond design basis accidents elimination skills during functional exercises immediately at the facilities.

Managers of EPO services and teams with their subordinates (that are involved and those not involved in the EPO) in compliance with the approved training schedule of 2-4-hours training programme conduct annual theoretical practice on emergency preparedness and civil protection in the class of Accident Management Centres for the members of all 15 training groups.

All the EPO services personnel shall be trained to respond in the event of an emergency.

Once per three years the personnel of EPO participate in full scale exercises for checking emergency preparedness level of personnel of EPO headquarters, all services and teams and the ability to work in complicated conditions while carrying out the specified tasks.

During the full-scale exercises the actions of managers and personnel of EPO are observed and assessed by appointed supervisors.

When analysing the full-scale exercises the supervisors report on merits and flaws in the actions of managers and personnel of EPO services as well as on the disadvantages and misjudgements made during the exercises.

After completion of full-scale exercises the Manager of the exercises together with Head of EPO headquarters (or its assistant) prepare a report on performance of full-scale exercises. The report is to be approved by Director General of the INPP, registered and stored in Audit, Safety and Quality Management Division. Two copies of the report are to be sent to the Ministry of Energy of the Republic of Lithuania and VATESI.

On the basis of the reports of the supervisors, participated in the exercises, the workers of the Fire Surveillance and Civil Protection Group of Audit, Safety and Quality Management Division prepare the Plan of Corrective Actions for Emergency Preparedness in order to eliminate the detected disadvantages, and send the report to VATESI for control.

Training and exercises of Regulatory Authorities staff

National level training for first responders and other competent authorities is organized every year. The purpose of this training is to strengthen the abilities of the competent authorities to respond and act in case of nuclear or radiological accident. Gained experience is shared with workers from other institutions in charge for rapid response.

Main regulating institutions, such as VATESI, RPC, has established its own emergency staff training and exercising programs.

In accordance with internal procedures on ERC staff functional training, all VATESI's Emergency response centre staff has to pass initial and refreshing training permanently. Each key staff members or groups have personal set of issues to be covered. Training consists from theoretical and practical parts and depends on position in ERC. Members of ERC are also periodically trained under a programme of induction training on civil protection in the Civil Protection Training Centre of the FRD under the Ministry of the Interior.

Key Authorities also participate in various international exercises, such as Convex, ECURIE, CBSS, etc., organized by the IAEA, EC, NATO and other international organizations.

On 14th of March, 2013 Lithuania has participated in the Joint Nordic-Baltic nuclear emergency exercise NB8 hosted by Finland. Eight organizations in Lithuania took part in this exercise (Lithuanian Hydro-meteorological Service, Office of the Prime Minister, Fire and Rescue Department, Radiation Protection Centre, State Nuclear Power Safety Inspectorate, Ministry of Foreign Affairs, Agency of Environment Protection, Ministry of Interior.

The exercise objectives were to test cooperation, communication and coordination of actions between participating countries' radiation and nuclear safety organizations and between the Ministries for Foreign Affairs and embassies of NB8 countries.

The main aims of exercise were:

- To test co-operation, communication and coordination of actions (including protective and precautionary measures) at international level;
- to analyse decisions made in different countries;
- to assess the potential hazard area predictions by different countries;
- to test arrangements on providing assistance to other countries.

NB8 exercise was a good opportunity to test Lithuania's emergency response arrangements in case of nuclear emergency outside country's borders. Some areas for improvement of arrangements were indentified and corrective measures are under consideration.

Due attention to nuclear safety in the NB8 region and neighbouring countries is regarded as of utmost importance for all NB8 countries; therefore, joint exercises aiming to improve emergency preparedness and response measures as well as international cooperation among NB8 countries are necessary and welcome.

16.1.5. Regulatory review and control activities

VATESI is performing regular inspections at INPP to check that the emergency preparedness arrangements are implemented properly. This includes control of training and exercising of Emergency Response Organization staff and facility workers, review of emergency planning and response procedures and documents, inspection of equipment and functionality of Emergency Operation Centre, inspection of self-protection equipment and tools for emergency response organization workers.

Inspectors of VATESI participate in training and exercising activities as observers and give recommendations.

Every year health care hospitals are checked by RPC for its preparedness to take and render medical aid for injured people during radiological and nuclear accidents. Also workshops and training courses are organized for the specialists of public and personal health care. The training is provided on how in case of an accident to provide help to injured persons.

16.1.6. International arrangements, including those with neighbouring States, as necessary

Government of Republic of Lithuania has signed a number of international agreements with neighbouring countries and other States in the field of cooperation assistance in case of emergency situations:

- agreement between Germany and Lithuania on assistance in case of natural disasters and severe emergencies (signed in 1994);
- agreement between Poland and Lithuania on cooperation and assistance in case of disasters, elemental events, and other emergencies (signed in 2000);
- agreement between Hungary and Lithuania on cooperation and assistance in case of disasters and severe emergencies (signed in 2001);
- agreement between Latvia and Lithuania on assistance in case of natural disasters and other severe emergencies (signed in 2001);
- agreement between Ukraine and Lithuania on cooperation and assistance on emergency prevention and liquidation of emergency consequences (signed in 2003);
- agreement between Sweden and Lithuania on cooperation in the field of emergency prevention, preparedness and liquidation (signed in 2003);
- agreement between Belarus and Lithuania on cooperation in the field of prevention and liquidation of natural disasters and severe emergencies (signed in 2003);
- agreement between Pennsylvania Emergency Management Agency (US) and Lithuania on cooperation and assistance in the field of prevention and liquidation of emergencies (signed in 2009);

Project of Agreement between Russia and Lithuania on cooperation and assistance in the field of prevention and liquidation of emergencies is under development.

16.2. Article 16(2) – Information of the public and neighbouring states

16.2.1. Overview of the arrangements for informing the public in the vicinity of the nuclear installations about emergency planning and emergency situations

The State Emergency Management Operational Centre is responsible for providing information to public in case of emergency. The State Emergency Management Operational Centre shall activate the Press Centre in the Press Service of Government of Republic of Lithuania or in FRD.

In case of an emergency Sate and municipality's institutions, public offices and citizens is notified using existing notification public warning and informing system, which consists of 489 central and 485 local electric sirens and cell-broadcast facilities. After notifying signal, the

information about situation, possible consequences and process of liquidation of emergency is vocally spread through companies and institutions emergency sound systems and using national and local broadcasters.

The citizens of municipalities are notified using technical and organizational means described in each municipality's emergency management plan. In places not covered by notification network system citizens are informed by using existing communication system, cell-broadcast facilities and specialized vehicles equipped with sound amplifying systems. Also courier or local police services could be used for spreading the information.

According to the order approved by Director of the FRD, the heads of national importance objects and those registered in the registry of dangerous objects are responsible for notification of public, national and municipal institutions and public offices which could be affected by emergency.

Ministries and other national institutions are responsible for notifying their own staff. FRD shall notify the population, using national television and radio channels, most of commercial broadcasting companies (which work in FM), as well as through the wire radio communication network.

16.2.2. Arrangements to inform competent authorities in neighbouring States, as necessary

In 1994 Lithuania has joined to Convention on Early Notification of a Nuclear Accident and in 2000 to Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. VATESI is responsible for implementation of Convention on Early Notification and FRD is responsible for implementation of Convention on Assistance. According to IAEA's EPR-IEComm requirements, VATESI is National Warning Point, National Competent Authority for events abroad and FRD – National Competent Authority for domestic events. VATESI is also a contact point and competent authority in ECURIE arrangements.

Mutual assistance policy between Lithuania and the neighbouring countries is based on bilateral agreements.

The bilateral agreement between Lithuania and Denmark On information exchange and co-operation in the field of nuclear safety and radiation protection has been signed on 26 March 1993.

The bilateral agreement between Lithuania and Norway On Early Notification of a Nuclear Accident and Information exchange about Nuclear Objects has been signed on 13 February 1995.

The Arrangement between Lithuania and Poland On information exchange and co-operation in the field of nuclear safety and radiation protection has been signed on 2 June 1995.

The Agreement between Lithuania and Latvia On Early Notification of Nuclear Accidents, Exchange of Information and Co-operation in the Field of Nuclear Safety and Radiation Protection has been signed on 3 October 2003.

The agreement on early notification of Nuclear and Radiological Emergencies between the State Nuclear Power Safety Inspectorate of the Republic of Lithuania and the Swedish Radiation Safety Authority of the Kingdom of Sweden has been signed on 1 January 2009.

The Agreement between Lithuania and Belarus On Early Notification of Nuclear Accidents, Exchange of Information and Co-operation in the Field of Nuclear Safety and Radiation Protection is under negotiation process.

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 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 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. Article 17(1) – Evaluation of site related factors

17.1.1. Overview of arrangements and regulatory requirements relating to the siting and evaluation of sites of nuclear installations

Parliament of the Republic of Lithuania, by the advice of the Government, adopts a law on the construction of a new nuclear plant and its site. In making a decision on the construction of a specific nuclear facility, the Government of the Republic of Lithuania takes into consideration:

- economic and public needs;
- the principal characteristics of the use of natural resources and their impact on the environment;
- nuclear safety and radiation protection guarantees;
- the opinion of the local authority on whose territory the intended facility will be sited.

Sites for the construction of the VNPP are selected in accordance with the IAEA recommendations and national requirements of nuclear safety. Compliance with the IAEA Safety Standards is mandatory in determining the appropriateness of construction sites as well as in evaluating the engineering geological conditions of the sites and in carrying out engineering geological (geotechnical) investigations.

In accordance with the Law on Nuclear Safety of the Republic of Lithuania, prior to starting the preparation of the NPP design adapted to a specific construction site, the safety analysis of the site and the justification of safety have to be performed. The results of such analysis and justification are presented in the Site Evaluation Report which has to be reviewed and approved by the VATESI.

17.1.1.1. Overview of assessments made and criteria applied for evaluating all site related factors affecting the safety of the nuclear installation, including multi-unit failure, loss of infrastructure, and site access following an event

The VAE has undertaken a number of preparatory works that are necessary in order to be properly prepared for construction of the new NPP in Lithuania.

The VNPP is intended to be built in the vicinity of the INPP currently under decommissioning, in the state land plot used by the VNPP. This land plot has been marked in the master plan of the territory of the Republic of Lithuania („the Master Plan“) as a region of functional priorities of energy

interests. The Master Plan is the main planning document governing the long-term strategy for the use and management of the country‘s territory and setting the main planning conditions for the master and special plans on regional/county level. The subproject of Coordination of the preparation of the territorial planning documents was required in order to include the NPP as a new nuclear energy facility in the Master Plan and all the related territorial planning documents. The final territorial planning document was the Detailed plan, where the particular land plots are formed and planning conditions set. Detail plan was approved by the Visaginas town municipality council on the 19 of May, 2010. This approval was the official completion of subproject.

The ground water monitoring programme on both potential construction sites of new NPP started in 2011 complying with the IAEA recommendations. Safety guide NS-G-3.2 Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants Clause 3.8 states that the monitoring activities for groundwater should be initiated about two years before the start of plant construction. New observation network of 16 groundwater wells was completed in addition to nearby located previously installed the INPP site monitoring boreholes. The new network enables to carry out site specific groundwater monitoring programme and to get information on how the measured hydro-geological parameters and the hydrodynamic mode of groundwater change in the period between the evaluation of the sites and the beginning of operation of the nuclear power plant as well as to verify possible changes in the groundwater regime.

The groundwater monitoring programme for 2011-2012 was prepared in early 2011 and coordinated with responsible authorities – Regional Environmental Protection Department and Lithuanian Geological Survey. Subsequently, all monitoring activities were carried out according to approved programme and quality assurance programme.

The detailed description of the process and activities related to performed subprojects were provided in the 5th National report. Since the issue of the 5th National report following activities with regards Preparation of the special NPP communications plan were implemented:

- The VAE was officially appointed as the special communications plan’s organizer;
- The consultant company for preparation of special communications plan was selected;
- The communications plan was prepared according the Procedures for the preparation, coordination and approval of special communications plans;
- The public hearing procedure was competed.

Currently special communications plan is being coordinated with all relevant state and municipal institutions.

17.1.1.2. Overview of design provisions used against human made external events and natural occurring external events such as fire, explosion, aircraft crash, external flooding, severe weather conditions and earthquakes and the impact of related sequential natural external events

Site Assessment against the IAEA Safety Requirements

The scope and activities of the project were described in detail in the 5th National report. Since the issue of the 5th National Report the project has proceeded successfully. All the planed evaluations have been completed, Site Evaluation Report has been prepared and submitted for the review in 2012.

During site evaluation process firstly all available geological, geophysical, seismological, meteorological, hydrological and other data collected by expert teams for the region extending more than 300 km from the sites. Secondly, new site vicinity and site scale electric tomography resistivity, seismic and engineering geological surveys conducted in 2009-2010 by number of Lithuanian and foreign companies including geophysical companies from Denmark, Hungary, geotechnical laboratory from Germany. The gathered available data and newly acquired results were collected and analysed by Lithuanian and foreign experts in Site Evaluation Report. All documents following the IAEA requirements were independently reviewed and improved when necessary after the review.

The main result of this activity is that after considering the following aspects:

- The effects of external events occurring in the region of the VNPP sites;
- The characteristics of the VNPP sites and their environment that could influence the transfer to persons and the environment of radioactive material that has been released;
- The population density and population distribution and other characteristics of the external zone in so far as they may affect the possibility of implementing emergency measures and the need to evaluate the risks to individuals and the population.

It was concluded that there are no exclusion criteria and no deficiencies that cannot be compensated for by means of design features, measures for site protection or administrative procedures. Therefore, both investigated sites are suitable for construction of the VNPP.

Additionally the Site Evaluation Report was reviewed by Independent IAEA Site Safety Review Mission (SSRM) which took place on 8–12th of November, 2010. IAEA experts stated that "Sites evaluation is conducted in line with IAEA requirements and guides, the volume of investigation is sufficient, and sites are suitable for construction of Visaginas NPP". The experts of the mission have submitted several recommendations, which may be implemented only after selecting of nuclear technologies and layout of nuclear facilities providing opportunities for additional investigations related with design works.

17.1.2. Regulatory review and control activities

In accordance with the Law on Nuclear Safety of the Republic of Lithuania, prior to starting the preparation of the NPP design adapted to a specific construction site, the safety analysis of the site and the justification of safety have to be performed. The results of such analysis and justification are presented in the Site Evaluation Report which has to be reviewed and approved by the VATESI.

Whereas the nuclear power plant's site evaluation covers many areas – nuclear safety, physical security, meteorology, hydrology, geology, aviation, the Law on Nuclear Safety provides that apart from VATESI, the Ministry of Health, Civil Aviation Authority, Lithuanian Geological Survey, Lithuanian Hydro Meteorological Service, Fire Safety and Rescue Department have to take part in reviewing the NPP Site Evaluation Report. To enforce the provisions of the Law, Resolution of the Government setting the procedure for reviewing the NPP Site Evaluation Report was approved.

With regard to the provisions of the Law on Nuclear Safety of the Republic of Lithuania, recommendations from the IAEA mission Review of the New Nuclear Power Plant's Site Evaluation Report took place on 8-12th of November 2010 in Vilnius, and the new experience in the NPP site evaluation gained by VATESI, in 2011 VATESI revised the legal act Nuclear Safety Requirements BSR-2.1.3-2010 "Nuclear Power Plant Site Evaluation Requirements".

At the end of 2010, the VATESI approved the list of events requiring thorough analysis, which was submitted to the VATESI by the VAE in accordance with the General Requirements for Evaluation of the Nuclear Power Plant Site. The list includes the credible natural events and those that can be caused by human activity; all of them have to be comprehensively analyzed in the NPP Site Evaluation Report.

17.2. Article 17(2) – Impact of the installation on individuals, society and environment

17.2.1. Criteria for evaluating the likely safety related impact of the nuclear installation on the surrounding population and the environment

According to the Law on the Proposed Economic Activity the safety related impacts of nuclear installations on the population and environment shall be defined in EIA report. The report shall contain the following information: description of pollutants to be generated; description of waste generation and management; description of components of the environment potentially to be impacted by the proposed economic activity; description and evaluation of any potential direct and indirect

impact of the proposed economic activity upon public health, flora and fauna, soil, surface and subsurface of the Earth, air, water, climate, landscape and biodiversity, material values, immovable cultural heritage and interaction among the aforesaid components of the environment; description of measures provided for in order to avoid, reduce, compensate the negative impact upon the environment or to liquidate consequences thereof; analysis of alternatives identified by the preparer of EIA documents, including reasons for selection taking account of best available manufacturing techniques and potential impact upon the environment; information about problems of technical or practical nature that the preparer has encountered in the course of preparation of the EIA documents; informational about potential emergencies as well as relevant prevention measures and emergency response measures; analysis of findings of environmental monitoring (if any), outline of any planned monitoring; and summary of all the information contained in the report. According to this Law, it is possible to decide whether the proposed economic activity by virtue of its nature and environmental impacts may be carried out on the chosen site only after having performed environmental impact assessment.

For the present Environmental impact assessment is carried out in accordance with:

- The Law on Environmental Impact Assessment of the Proposed Economic Activity (1996, last amended in 2005);
- Governmental Resolution On Empowering the Ministry of Environment and the Subordinate Institutions (2000, last amended in 2003);
- The Order of the Minister of Environment on Approval of Regulations on Preparation of the Environmental Impact Assessment Program and Report (2000, revised 2006);
- The Order of the Minister of Environment on Informing the Public and Public Participation in the Process of Environmental Impact Assessment (2000, revised 2006);
- The Order of the Minister of Environment on Approval of Guidelines on the Quality Control of Environmental Impact Assessment of a proposed Economic Activity;
- The Order of the Minister of Environment on Investigating the Environmental Impact Assessment Document at the Ministry of Environment and Subordinate institutions (2000, revised 2006).

Lithuanian Hygiene Standard HN 73:2001 defines dose limits for members of the public:

- The limit for effective dose – 1 mSv in a year;
- In special circumstances limit for effective dose – 5 mSv in a year provided that the average over five consecutive years does not exceed 1 mSv in a year;
- The limit on equivalent dose for the lens of the eye – 15 mSv in a year;
- The limit on equivalent dose for the skin – 50 mSv in a year. This limit has to be averaged over 1 cm^2 area of skin subjected to maximal exposure.

In optimization of radiation protection the source related individual dose is bounded by a dose constraint. The dose constraint for each source is intended to ensure that the sum of doses to critical group members from all controlled sources remains within the dose limit. According to requirements of the Nuclear Safety Requirements BSR-1.9.1-2011 the exposure of population shall be limited by application of dose constraint during design, operation (both normal operation conditions and anticipated operational occurrences) and decommissioning of nuclear facilities. If more than one nuclear facility contributes to the exposure of the population, the total sum of annual effective doses to members of the public from all contributing nuclear facilities shall not exceed the dose constraint. The established dose constraint for members of the public is 0.2 mSv per year.

According to Nuclear Safety Requirements BSR-1.9.1-2011, if radionuclides are dispersed into the environment by several pathways (e.g. by atmospheric and water paths) and the members of the same or different critical groups of population are impacted, the particular pathway resulting dose shall be limited in such a way that the total sum of doses from all pathways shall not exceed the dose constraint. The impact due to direct external ionizing irradiation shall be taken into account and the total dose (due to radioactive emissions and due to direct irradiation) to the critical group member of population shall not exceed the dose constraint.

17.2.2. Implementation of these criteria in the licensing process

Participants of the environmental impact assessment shall be as follows:

- Competent authority – Environmental Protection Agency (till May 2010 the competent authority was Ministry of Environment) as competent authority coordinates the environmental impact assessment (EIA) process. This institution also investigates and approves EIA programs, examines the proposals of the public, the EIA reports and conclusions issued by other relevant parties and makes justified decisions if the proposed economic activity, taking into account it's nature and size, may be carried in a chosen site.
- Environmental Protection Agency also has the right to require amendments or correction of EIA documents, if the quality of EIA documents is not satisfactory, or some topics are not adequately covered.
- Relevant parties of the EIA – governmental institutions, responsible for health protection, fire-prevention, protection of cultural heritage, development of economy and agriculture, and municipal administrations. In some cases, assistance of additional governmental institutions might be required. As regards radioactive waste management facilities State Nuclear Power Safety Inspectorate and Radiation Protection Centre participate in the EIA process as relevant parties. The relevant parties of EIA, in accordance with their competence review the EIA programs and reports and provide conclusions regarding the EIA programs, reports and the feasibility of the proposed economic activity. They also have the right to require for amendment or corrections of the EIA documents if the topics within the scope of their competence are not investigated sufficiently.
- Organiser of the proposed nuclear activity (developer).
- Preparer of EIA documentation that is obliged by organiser (developer).
- The public.

The preparer of EIA documentation obliged by the organizer (developer) shall carry out EIA procedures and prepare EIA documentation. EIA program shall include at least the following information:

- short description of the main alternatives studied by the preparer of the EIA documents;
- short description of the technical characteristics, technological process and materials planned to be used, as well as needed amount of natural resources and land use (during the construction and operation phases);
- short description of the territories that could be significantly affected;
- information about what components of the environment and what impacts will be analysed during the EIA;
- information on what aspects the impacts of the proposed economic activity on public health will be analysed;
- methods that will be used to predict and assess the effects on the environment, measures envisaged to avoid, reduce or offset negative environmental effects;
- information whether proposed economic activity may cause a significant negative impact on the environment of any foreign State;
- other important information.

The prepared program is submitted to the relevant parties of EIA that examine EIA program and provide conclusions in accordance with their competence. Relevant parties also have right to require for amendment or corrections of the program if the topics within the scope of their competence are not investigated sufficiently. Then the conclusions from all relevant parties of EIA and EIA program are submitted to the competent authority (Environmental Protection Agency), which reviews these documents and approves EIA program, however competent authority also has right to require for amendments and correction of the program. EIA report is prepared by the preparer of EIA documents. The report shall include at least the following information:

- information about the organizer (developer) of the proposed economic activity;
- information about the preparer of EIA documents;

- detailed information according to the topics of the EIA program and also additional information: description of the expected pollutants (names, calculations, hazardousness, risk group, etc.); description of waste generation and management; components of the environment that could be affected by the proposed economic activity; description and assessment of potential impacts of the proposed economic activity on public health, fauna and flora, soil, earth surface and underground, water, environmental air, climate, landscape, biodiversity, economic conditions, cultural heritage and the interaction of these components; methods that were used to predict and assess the effects on the environment; a description of measures envisaged to avoid, reduce or offset negative environmental effects or to alleviate their consequences;
- analysis of the alternatives and the indication of the reasons for the choice, taking into account the best available modes and production of potential environmental impact, at least several alternatives (e.g. Alternative locations, timings, technical and technological solutions, environmental impact mitigation measures) shall be investigated in the report, including the "zero" alternative, that refers to the environmental conditions and natural changes in the environment if the activity is not carried out and is used as the environmental baseline evaluation and a base for assessment and comparisons;
- identification of possible emergencies and accident-avoidance and emergency measures; analysis of environmental monitoring data (if available) and plan for environmental monitoring;
- a summary of all information considered in the report;
- other information that shall be included in the report (a description of technical or practical problems encountered by the preparer of the EIA documents in performing the EIA).

The developer informs the public about its completion and the forthcoming public hearing. Public hearing is organized by the developer. The public may submit motivated proposals regarding the environmental impact assessment and EIA report. According to the justified proposals of the public, amended report is provided to EIA relevant parties, which make conclusions regarding the report and the possibilities to carry out the proposed economic activity.

Decisions made during 2010-2012 on EIA of proposed nuclear activities:

- 09-08-2010 Ministry of Environment of Lithuania made a decision regarding the feasibility of INPP Unit 2 decommissioning and defueling (decision regarding EIA).
- 09-06-2011 Director of Environmental Protection Agency made a decision regarding the feasibility of decontamination and dismantling of INPP Unit 1 Turbine Hall equipment (decision regarding EIA).
- 13-07-2011 Director of Environmental Protection Agency made a decision regarding the feasibility of decontamination and dismantling of INPP Building V1 equipment (decision regarding EIA).
- 16-08-2011 Director of Environmental Protection Agency made a decision regarding the feasibility of decontamination and dismantling of INPP Boiler House equipment (decision regarding EIA).

17.3. Article 17(3) – Re-evaluation of site related factors

17.3.1. Activities for re-evaluation of the site related factors as mentioned in Article 17 (1) of the Convention to ensure the continued acceptability of the safety of the nuclear installation conducted according to appropriate standards and practices

See Section S.1.1.

17.3.2. Results of recent re-evaluation activities

See Section S.1.1.

17.3.3. Regulatory review and control activities

See Section S.1.1.

17.4. Article 17(4) – Consultation with other Contracting Parties likely to be affected by the installation

17.4.1. International arrangements

Environmental impact assessment in a transboundary context is regulated by the Law on Environmental Impact Assessment of the Proposed Economic Activity and by the United Nations Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). The parties to the Convention are entitled to participate in an environmental impact assessment procedure of the proposed nuclear activity (nuclear power stations and other nuclear reactors, including decommissioning of power stations or reactors; production, processing, enrichment, storage and disposal of nuclear fuel) carried out in Lithuania if the detrimental environmental impacts of the project could potentially affect the country in question. For other projects the transboundary impacts are analyzed through screening procedure. If competent authority decides that project might have significant transboundary effects national and transboundary EIA procedure will be applied.

Till May 2010 the Ministry of Environment was responsible for the practical organization of the environmental assessment procedures in a transboundary context (from May 2010 the competent authority is Environmental Protection Agency). As regarding the new nuclear power plant the Ministry of Environment has informed the respective authorities of Latvia, Estonia, Poland, Belarus, Finland, Sweden and Russia about the commenced environmental assessment process of the new nuclear power plant in Lithuania and inquired about their intent to take part in the environmental assessment procedure. Countries, participating in the EIA process of the new NPP, were provided with the EIA report. Austria, Belarus, Estonia, Finland, Latvia, Poland and Sweden submitted their remarks and recommendations to the EIA report. It should be noted that out of the countries participating in the EIA process only Belarus, Latvia, Poland and Austria expressed the interest to hold further consultation meetings on the issues of the largest concern for them. Authorities of Belarus, Latvia, Poland and Austria responsible for the EIA process submitted comments and conclusions of their experts to the Ministry of Environment, and these comments and conclusions were discussed during series of interstate consultations, held in Vilnius from November 2008 to February 2009. In April 2009 the Ministry of Environment adopted a decision concerning the permissibility of construction of the new Nuclear Power Plant in terms of impact upon the environment.

In accordance with the Article 37 of EURATOM Treaty and Lithuanian Regulation on Providing of General Data Concerning Plans for the Disposal of Radioactive Waste, General Data relating to any plan for the disposal of radioactive waste it is submitted to the Commission of the European Communities.

Lithuania is entitled to participate in an EIA procedure concerning a project of nuclear facilities located in the area of another country if the impacts of the project could potentially affect Lithuania. As of late 2009, Russian Federation and Belarus submitted the environmental impact assessment documents of the new nuclear power plants planned to be constructed in the proximity of the territory of Lithuania. Lithuania involves in the environmental impact assessment of the new nuclear power plants which are planned to be constructed in the neighbouring countries. During the period of 2010-2013 Lithuania requested Belarus and Russian Federation to provide necessary important information in relation to the nuclear safety and environmental impact assessment of both NPP projects.

Fukushima accident showed that serious problems are caused by lost supply of water and

electricity from external sources, therefore, Lithuania has repeatedly raised important questions related to cooling of planned NPPs in Kaliningrad and Belarus in case of loss of external supply of water and electricity.

It was stressed by Lithuania that safe NPP operation in Kaliningrad is inalienable from the necessity to ensure adequate emergency power reserves and necessary grid capacities and the evaluation of radiological impact during the accident in the NPP should be carried out according to International Atomic Energy Agency recommendations as well as seismic research. Additionally, other questions raised by Lithuanian side regarding site selection criteria, impact on environment and population, emergency preparedness and contingency planning, assessment of possible impact of large commercial airplane crash, assessment of the impact of possible transportation of radioactive waste have not been answered yet.

Taking into account possible impact to the NPPs by earthquakes, Lithuania proposed for Belarus to perform modern seismic safety assessment in all sites selected using the latest technological solutions. Additionally, according to the international practice, invitation of the IAEA mission to evaluate sites selected was proposed for Belarus. It should be stressed, that questions raised by the Lithuanian side regarding site selection criteria of the NPP in Belarus, impact on environment and population during normal operation and accidents, final radioactive waste disposal as well as assessment of possible impact of large commercial airplane crash, strength of the national regulatory authority have not been answered yet.

The final document of the Fifth Review Meeting of the Contracting Parties on 4-14 April 2011 included such important aspects as the need for contracting parties to make a final decision on new NPP site selection only in close cooperation with neighbor countries, and the need to evaluate potential sites for new NPPs in accordance with IAEA standards. Necessity to accomplish comprehensive site evaluation, including, but not limited to seismic safety assessment, before the start of a new NPP construction is one of the issues, which currently remains unsolved, in regard to sites in close vicinity to the Lithuanian border selected for construction of nuclear power plants in Belarus and Kaliningrad region of the Russian Federation.

17.4.2. Bilateral arrangements with neighbouring States, as applicable and necessary

Information about nuclear facilities and activities on territory of Lithuania shall be submitted to neighbouring countries according the bilateral agreements.

In 1994 Lithuania signed an Agreement between the Government of the Republic of Lithuania and the Government of the Republic of Poland on the implementation of the Convention on Environment Impact Assessment in a Transboundary Context.

Lithuania has intention to sign bilateral agreements with Latvia and Belarus. The draft Agreement between the Government of the Republic of Lithuania and the Government of the Republic of Belarus on the implementation of the Convention on Environment Impact Assessment in a Transboundary Context was prepared and sent to Belarus.

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.

18.1. Article 18(1) – Implementation of the "defence-in-depth" concept

18.1.1. Overview of arrangements and regulatory requirements concerning the design and construction of nuclear installations

A necessity to implement the "defence-in-depth" concept at all stages of safety related activities (including design and construction) is going to be comprehensively explained in draft regulation “Nuclear Safety Requirements BSR-2.1. - .Nuclear Power Plant Design”. The corresponding items are going to be prepared according to IAEA safety standard SSR-2/1 "Safety of Nuclear Power Plants. Design" and other IAEA recommendations and best international practice. This regulation will be applied for new build only. For existing INPP position about ‘defence-in-depth’ stated in the "General Regulations for Nuclear Power Plants with RMBK-1500 type reactors Safety", item 10 of which reads: "10. The safety of a nuclear plant shall be guaranteed by applying of the principle of "defence-in-depth", i.e. by the sequential implementation of protection measures based on a system of barriers to prevent the spread of ionizing radiation and radioactive materials to the environment, and systems of technical and organizational measures to protect these barriers and retain their effectiveness, and also to provide direct protection for the population.

The system of barriers includes:

- the fuel matrix;
- the fuel cladding;
- the boundary of the primary coolant circuit;
- the hermetically sealed protective enclosure surrounding localizing safety systems.

The system of technical and organizational measures includes:

- the selection of an appropriate site for the nuclear plant;
- the establishment of a sanitary-protection zone and a monitoring zone around the plant;
- a conservative approach to plant design incorporating fail-safe characteristics in the reactor itself and specific safety systems;
- assurance of quality of systems (components) of the plant and of all work carried out at the plant;
- nuclear plant operation in accordance with norms and technical requirements;
- maintenance of safety-related systems in good operating conditions through the implementation of preventive maintenance measures and replacement of worn-out components;
- timely detection of defects, detection of any deviations from normal functioning, and implementation of measures to remove their causes;

- organization of an effective system for registration of the performance results and monitoring;
- implementation of measures designed to prevent initiating events from developing into design-basis accidents, and design-basis accidents from developing into beyond-design-basis accidents;
- mitigation of the consequences of accidents which could not be effectively forestalled through localization of the radioactive materials released;
- measures designed to protect localizing safety systems against destruction during beyond-design-basis accidents and to maintain them in a functional state;
- preparation, and proper implementation when required, of emergency plans for the site itself and the area surrounding the site;
- selection and training for the actions required in both normal and emergency conditions of operating personnel;
- development of safety culture.

The principle of "defence-in-depth" is activated at all stages of safety-related activities. During normal operation all barriers and all means designed to protect them must be in good operating condition. If any of the barriers provided in the plant design or any of the means intended to protect those barriers (in the frames of justified conditions of safe operation) are found to be out of order, operation at power is not permitted.

The extent, to which the various safety functions are to be implemented, is specified in norms and technical requirements, and for each individual plant shall be stated and justified in the technical design" (The end of item 10).

18.1.2. Status with regard to the application for all nuclear installations of the defence in depth concept, providing for multiple levels of protection of the fuel, the primary pressure boundary and the containment, with account taken of internal and external events and the impact of related sequential natural external events

INPP safety is provided by engineering devices and organizational activities, which ensure that the internal and external exposure of staff and public, pollution of environment by radionuclides in case of normal operation and design basis accidents do not exceed the prescribed limits. After final shut down of INPP Unit 1 and Unit 2 the extent of application of "defence-in-depth" principle was considerably reduced but remains in corresponding extent, for example number of inspections of pressure boundary is reduced, but still foreseen; the emergency shutdown system in Unit 2 is still in operation, although some equipment is decommissioned due to that the range of its operation was foreseen only for unit in operation; control room still is operated by operators, although number of them in a shift was reduced taking into account inoperability of turbine and a wide set of other systems.

For the future VNPP after completion of technology-independent site evaluation activities, based on acquired site-specific data the layout of the ABWR nuclear power plant safety-related and auxiliary structures were designed. Further, necessary engineering geological and geotechnical investigations for the NPP design under future structures complying with IAEA requirements were identified. According to Lithuanian Technical Construction Regulation STR1.04.02:2011 “Engineering Geological (Geotechnical) Site Investigations” those investigations under the structures for design (project) is a part of the design stage.

In 2012 Engineering Geological (Geotechnical) Soil Investigations for NPP Design were launched and completed by Lithuanian - United States companies’ consortium. The purpose of works was to obtain sufficient engineering geological information and geotechnical engineering parameters of geological layers to support final design of ABWR Safety Related structures. The investigations were designed, coordinated and conducted in accordance with the technical construction regulations, IAEA and US NRC documentation and quality assurance requirements. The fieldwork and laboratory

activities were completed by October 2012 and all results independently reviewed. The prepared investigation report is under coordination with responsible authorities. After final approval of authorities the report will be presented to the designer as input for design of the new NPP.

18.1.3 Extent of use of design principles, such as passive safety or the fail safe function, automation, physical and functional separation, redundancy and diversity, for different types and generations of nuclear installations

The design principles of increment of reliability of safety related systems and assurance of safety functions such as fail safe function, automation, independence, physical and functional separation, single failure criterion, redundancy and diversity are required to be used in the designs of the particular systems. The requirements are implemented in regulations BSR-2.1.2-2010 “Basic Safety Requirements for Nuclear Power Plants with RBMK-1500 Reactors” and VD-T-001-0-97 “Nuclear Safety Regulations for the Reactor’s of Nuclear Power Plants”, also in draft regulations dedicated to new builds.

18.1.4. Implementation of design measures or changes (plant modifications, backfitting) to prevent beyond design basis accidents or to mitigate their radiological consequences if they were to occur

At the INPP were implemented a set of technical and organisational measures concerning management of beyond design basis accidents (see Sections 19.4 and S.1.1). Due to final shut down of INPP extent of the measures is reduced. The management of severe accidents at the INPP was comprehensively reviewed during European "stress test" and some additional measures were proposed.

18.1.5. Improvements implemented for designs for nuclear power plants as a result of deterministic and probabilistic safety assessments made since the previous National Report; and an overview of main improvements implemented since the commissioning of the nuclear installations

INPP activity for safety improvement is based upon priorities to meet the modern requirements of national and international safety standards, upon results of the analysis, carried out in SAR-1, SAR-2 and RSR scope, also it includes additional calculations, implementation of VATESI guidelines, modifications, which improve the system reliability, thus providing the INPP safety. Managerially this activity is fulfilled within the framework of SIP-1 (1993-1996), SIP-2 (1997-2004) and SIP-3 (2005 – 2009).

The safety improvement program SIP is reviewed annually and is still in implementation at the INPP while the plant is in permanent shutdown.

The detailed information about implemented improvements is presented in section 6.3.

18.1.6. Regulatory review and control activities

The implementation of the measures linked to “defence-in-depth” principle at the INPP is controlled by regulatory authority in the frame of control of implementation of Safety Improvement Program (SIP, see Article 6) and other measures such as implementation separate modifications, and by ordinary regulatory inspections.

18.2. Article 18(2) – Incorporation of proven technologies

18.2.1. Arrangements and regulatory requirements for the use of technologies proven by experience or qualified by testing or analysis

In 2011 VATESI initiated a preparation of a new Nuclear Safety Requirements “Design of nuclear power plant” and these requirements is under final reviewing and is intended to be issued as soon as possible. Nuclear Safety Requirements “Design of nuclear power plant” states that the design

of safety important (SI) structures, systems and components (SSC) of a NPP, technologies used by the NPP, other technical and organizational solutions that have impact to the NPP safety shall be based on proven engineering practice, documented in standards and other normative technical documents. The design of a NPP shall rationally seek to use SSC IS that have already been used in the nuclear power industry for a similar purpose, and use of which has been justified. Solutions of the NPP design whose relevance, reliability and other features have not been proven by the existing experience in the nuclear power industry shall be based on:

- experience of similar application of such decisions in other industries;
- experience in operation of prototypes of such equipment;
- if there is no experience of such solutions application in other industries – on relevant studies that demonstrate compliance of solutions with the set criteria.

Prior to application of solutions of the NPP design whose relevance, reliability and other features have not been proven by the existing experience in the nuclear power industry, they shall be verified and validated, and their acceptability shall be finally confirmed by observations during operation of the NPP.

In 2011 VATESI issued renewed Nuclear Safety Requirements "Requirements for categorization and implementation of modifications at nuclear energy facility", BSR-1.8.2-2011 where the basic principles for implementation for any modification are set.

Lithuania regulations require that the technical and organizational arrangements made to ensure plant safety must be proven by prior experience or testing, experimental investigations and operational tests on prototypes, and must conform to the norms and technical requirements adopted for the nuclear power field this approach is to be taken not only in the design of equipment and of the plant as a whole, but also in the actual manufacturing of equipment and in the construction and operation (decommissioning) of the INPP.

18.2.2. Measures taken by the licence holders to implement proven technologies

Proven technologies are used by INPP at present time in process of INPP decommissioning. Main stages of decommissioning are:

- Preparation of decommissioning programme, design documents, safety analysis reports and other needed documents;
- Reactor defueling;
- Defueling of the spent fuel storage pools;
- Dismantling of plant equipment and demolishing of structures and buildings;
- Treatment and disposal of radioactive waste.

At the stage of decommissioning preparation, commonly accepted proven practice was used. Contracting parties involved in decommissioning preparation activities were selected by open tenders taking into account the previous experience.

At the stage of reactor defueling, the existing defueling procedures and facilities are used, which were used for reactor refuelling during operation. All defueling works are performed by skilled INPP staff. The refuelling/defueling procedures and facilities were tested many times during INPP operation and INPP staff has a good practice to perform reactor defueling. So, undoubtedly proven technology is used at the stage of reactor defueling.

The comprehensive safety analysis was carried out before the stages of reactor defueling and spent fuel storage pools defueling. Parties involved in safety analysis activities were selected by open tenders taking into account the previous experience in this area.

At the stage of dismantling of plant equipment, structures and buildings, commonly accepted technologies are used (for Unit 1) and will be used (for Unit 2). Special attention is focused on monitoring and control of the equipment and waste radioactivity.

VNPP will be designed in accordance with nuclear energy legislation, regulatory guidelines and

nuclear safety standards. Visaginas NPP as future licence holder and its vendors shall meet all the safety requirements and shall take all measures to use proven technologies. The latest safety requirements will be taken into account in Visaginas NPP design and construction.

18.2.3. Analysis, testing and experimental methods to qualify new technologies, such as digital instrumentation and control equipment

The design management of instrumentation and control systems is an integral part of the licensed activities in nuclear power industry and shall be conducted with accordance to the Nuclear Safety Requirements BSR-1.4.1-2010. Monitoring and protection systems design, including subsequent design changes, modifications, or improvement of safety measures shall be implemented in accordance with relevant laws, regulations and nuclear safety normative technical documents.

Many modifications were introduced into the design of INPP systems to improve reliability and safety during INPP operation. Most of improvements were based on proven technologies but some of them were unique. The most important unproved modifications are:

- Additional protection systems were designed and introduced;
- Diverse Shutdown System was designed and introduced;

The purpose of additional protection systems is to ensure Anticipated Transient Without Scram (ATWS) for most important ATWS scenarios and to provide new emergency protections such as Low Operational Reactivity Margin protection and Low Coolant Flow protection. These systems are computer based redundant systems with independent trains. All systems were qualified by testing. The comprehensive safety analysis was carried out before the implementation of each protection system.

The purpose of DSS is to provide an independent and diverse way to shut down the reactor if the existing shutdown system fails. DSS consists of independent sensors, computer based initiating part and diverse control rod drives. The sensors and initiating part of DSS are redundant with independent trains. All parts of DSS were qualified by testing. The comprehensive safety analysis was carried out before the implementation of this system.

18.2.4. Regulatory review and control activities

VATESI performs review and inspection activities in INPP. VATESI activities cover all important aspects of plant specifying, designing, contracting, construction, equipment manufacturing, qualification, testing, installation, plant commissioning, operation, maintenance and decommissioning. An important part of these aspects is using of proven technologies at all stages of NPP life cycle. The special attention is focused on design analysis, compliance with safety standards, safety justification, reliability calculation, environmental qualification and functional testing of newly designed equipment, components and systems.

18.3. Article 18(3) – Design for reliable, stable and easily manageable operation

18.3.1. Overview of arrangements and regulatory requirements for reliable, stable and easily manageable operation, with specific consideration of human factors and the human–machine interface

Competencies of the VATESI and responsibilities of a licence holder are described in Article 9 of this report.

The “Nuclear Safety Regulations for the Reactor’s of Nuclear Power Plants” (VD-T-001-0-97) define in detail the requirements for NPP Safety. The regulations require that design of the NPP’s (their systems, structures and components) shall be optimal for operator performance. It is required within this document that:

- the working areas and working environment of the site personnel shall be designed

according to ergonomic principles;

- systematic consideration of human factors and the human-machine interface shall be included in the design process at an early stage and shall continue throughout the entire process, to ensure an appropriate and clear distinction of functions between operating personnel and the automatic systems provided;
- the human-machine interface shall be designed to provide the operators with comprehensive but easily manageable information, compatible with the necessary decision and action times;
- verification and validation of aspects of human factors shall be included at appropriate stages to confirm that the design adequately accommodates all necessary operator actions;
- as equipment operator, the operator shall be provided with sufficient information on parameters associated with individual plant systems and equipment to confirm that the necessary safety actions can be initiated safely;
- the design shall be aimed at promoting the success of operator actions with due regard for the time available for action, the physical environment to be expected and the psychological demands to be made on the operator. The need for intervention by the operator on a short time-scale shall be kept to a minimum. It shall be taken in to account in the design that the necessity for such intervention is only acceptable provided that the designer can demonstrate that the operator has sufficient time to make the decision and to act; that the information necessary for the operator is simply and unambiguously presented.

The requirements BSR-2.1.2-2010 “General Regulations on Ensuring of Safety of Nuclear Power Plants with RBMK-1500 Type Reactors” require that design of a NPP shall be optimal for operator performance as well as provide means to eliminate single personnel errors or mitigate their consequences, including those during the maintenance. The NPP control room shall contain equipment which provides information about the plant operational state and any deviations from normal operation as well as which monitor the state of the plant safety system during operation and their functioning during operational transients and accidents.

The information on regulatory requirements related to management of human factor and the corresponding INPP arrangements is presented within Article 12 of this report (see Sections 12.1. and 12.2., respectively).

18.3.2. Implementation measures taken by the licence holder

The final shut down of the INPP Unit 1 was in 2004. After the final shut down of the remaining INPP Unit 2 on 31 December 2009 the licence holder performs decommissioning activities in the units. The INPP does not plan to operate the units, as well as to change or modify them for reliable, stable and manageable operation.

The INPP operating personnel ensures safety of the INPP and undergoes necessary training and examinations to remain competent for the assigned tasks.

18.3.3. Regulatory review and control activities

INPP preparations to decommission INPP as well as the related organizational changes important to INPP safety are monitored and assessed by VATESI. Information of functions and activities of VATESI is presented in Article 9 of this report.

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 program demonstrating that the installation, as constructed, is consistent with design and safety requirements;

ii. Operational limits and conditions derived from the safety analyses, 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 license to the regulatory body;

vii. Program to collect and analyze operating experience are established, the results obtained and the conclusions drawn are acted upon and the 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 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.

19.1. Article 19(1) – Initial authorization

19.1.1. Overview of the arrangements and regulatory requirements for the commissioning of a nuclear installation, demonstrating that the installation, as constructed, is consistent with design requirements and safety requirements

The Law on Nuclear Energy and the Law on Nuclear Safety together with the regulations made under other laws establish the licensing system for activities related to nuclear materials or nuclear cycle materials, as well as for nuclear facilities of the following life-stages: site evaluation, design, construction, commissioning, operation, and decommissioning.

The Law on Nuclear Safety foresees an issuance of VATESI permissions for first carrying in of nuclear fuel into site of any nuclear reactor, for first loading of fuel into reactor core and for first start-up of a reactor.

Commissioning of nuclear installation may be implemented only according to a commissioning programme which shall be approved by VATESI. Detail requirements for commissioning of the NPPs are being prepared and are expected to be issued in 2014.

19.1.2. Conduct of appropriate safety analyses

In current legislation is stated, that Safety analysis shall be provided by claimant for the licence. The analysis and justification of nuclear safety in all operational states including site evaluation, design and commissioning of the NPP are described in Section 14.1.2.

19.1.3. Commissioning programmes

The commissioning programme was developed prior to the INPP start-up. The Programme was agreed with the General Designer of INPP, General Designer of Reactor, Scientific Adviser and endorsed by the regulating body and approved by the operating organisation.

In accordance with Resolution of the Government of the Republic of Lithuania No 1491 dated 25 November 2004, INPP Unit 1 was shutdown on 31 December 2004. In December 2006 Unit 1 was granted a status of finally shutdown unit and the license conditions were reviewed.

In accordance with Resolution of the Government of the Republic of Lithuania No 1448 dated 4 November 2009, INPP Unit 2 was shut down on 31 December 2009. Unit 2 is to be granted a status of finally shutdown unit in May 2010. In May 2010 Unit 2 was granted a status of finally shutdown unit and the license conditions were reviewed.

19.1.4. Programmes of verification that installations, as constructed, are consistent with the design and in compliance with safety requirements

According to the Law on Nuclear Safety, commissioning of nuclear installation may be implemented only according to a commissioning programme which shall be approved by VATESI.

19.1.5. Regulatory review and control activities

Before final shutdown of both INPP units, in accordance with the Operation Licenses conditions and regulation “Rules for issuance of permissions to start units after outage or short-term shutdowns”, permits for further operation were obtained after each outage.

VATESI is preparing for new VNPP licensing, however as new build has not started yet, no regulatory review and control activities regarding commissioning were performed.

19.2. Article 19(2) – Operational limits and conditions

19.2.1 Overview of arrangements and regulatory requirements for the definition of safe boundaries of operation and the setting of operational limits and conditions

It is stated in clause 147 of the General Regulations on Ensuring of Safety of Nuclear Power Plants with RBMK-1500 Type Reactors, BSR-2.1.2-2010, that the principal document defining safe operation is the technical specification, which lays down main modes and functions of safe operation as well as general sequence the performance of all operations related to plant safety, and also specifies the limits and conditions of safe operation. The limits and conditions of safe operation shall be justified by design and/or other relevant documents”.

19.2.2 Implementation of operational limits and conditions, their documentation, training in them, and their availability to plant personnel engaged in safety related work

For INPP, the limits and conditions of safe operation was set and justified in the Technical Safety Justification prepared by the plant Main Designer NIKIET and Scientific Adviser “Kurchatov Institute” and the General Designer (St-Petersburg, Russia). In the frames of in-depth safety assessments for INPP Unit 1 and Unit 2 - SAR-1 and SAR-2 respectively the limits and conditions of safe operation were reviewed and their correctness was confirmed.

Technical Specification - The basic document specifying the safety of INPP and determining the limits and conditions of safe operation - shall be reviewed every three years. If necessary, the relevant corrections are incorporated to the Technical Specification in case the norms, standards and regulations have changed in course of system and equipment modifications or operation experience of INPP. Each new issue of the Technical Specification or after each update of the Technical Specification it shall be endorsed by VATESI Each new issue of the Technical Specification or after each update of the Technical Specification it shall be endorsed by VATESI.

As long as there is nuclear fuel in the reactor core or in the storage pools, INPP Units 1 and 2 are considered to be nuclear facilities. At this stage all decommissioning activities are to be carried out in accordance with the design requirements as well as the limits and conditions of safe operation.

Safety of Unit 1 decommissioning at the stages of reactor defueling and fuel removal from the pools is justified in Unit 1 Decommissioning Safety Analysis Report (DSAR) for Defueling Stages 1 and 2, which was agreed by the Regulatory authority of the Republic of Lithuania in 2005. Unit 1 DSAR specifies the safety-related systems and components, which shall remain in operation during Unit 1 decommissioning.

In accordance with DSAR content of Technical Specification of Unit 1 was reduced and adapted for fuel removal from the core phase. After removal of spent fuel from the core at the end of 2009 the content Technical Specification was reduced once again and adapted for fuel removal from the storage pools. This activity included review of all relevant operation and maintenance procedures related to Unit 1 systems and components which remain in operation during stage 2 of Unit 1 defueling.

Safety of Unit 2 decommissioning at the stages of reactor defueling and fuel removal from the pools is justified in Unit 2 DSAR for Defueling Stages 1 and 2, which was agreed by the Regulatory authority of the Republic of Lithuania in 2010. Unit 2 DSAR specifies the safety-related systems and components, which shall remain in operation during Unit 2 decommissioning.

The validity of the Technical Specification for Operation of Unit 2 has been extended until 31 December 2010. Operation and maintenance manuals for Unit 2 systems and components are currently being reviewed taking into account shutdown state and new organizational structure which was implemented at INPP in 2010.

After finally shutdown of Unit 2 and new organizational structure implemented at INPP at the end of 2010 the content Technical Specification was adapted for fuel removal from the core phase.

Issues regarding training are defined in Section 11.2.3.

19.2.3. Review and revision of operational limits and conditions as necessary

After final shutdown of the INPP units many changes were made in accordance with BSR-2.1.2-2010 and DSAR (see Sections 19.2.1 and 19.2.2).

19.2.4. Regulatory review and control activities

Technical Specifications of the INPP units are approved by VATESI as well as any changes in it. Current values of safety related parameters are supervised during VATESI inspections.

19.3. Article 19(3) – Procedures for operation, maintenance, inspection and testing

19.3.1. Overview of the arrangements and regulatory requirements on procedures for operation, maintenance, inspection and testing of a nuclear installation

In compliance with the Quality Assurance Programme new Management system, which has been implemented at INPP according to Nuclear Safety Requirements. Requirements to Management System, BSR-1.4.1-2010 and Documentation control system acting at INPP all works relating to operation, maintenance, inspection and testing of all systems and equipment, including nuclear facility and safety-related systems shall be performed only on the basis and in accordance with the approved documents. More information is provided in Section 13.1.

19.3.2. Establishing of operational procedures, their implementation, periodic review, modification, approval and documentation

Document preparation, approval of its acceptability and support is performed in accordance with the established procedures.

Normal and emergency operating procedures, as well as testing procedures are developed in the operation-by-operation manner. There are the stops provided to assess results. The most important operations are performed under the direct supervision of another person. All actions of both the executors and their supervisors are recorded and signed in the relevant reports. The application area, limitations, responsibilities and actions of the personnel to detect normal operation failures are determined in each procedure.

Any testing at INPP not covered by the Technical Specification and operation procedures shall be performed in accordance with the special programmes presenting measurers to provide testing safety.

Prior to the document entering into force (including testing programmes) the applicability, usability of the documents shall be confirmed (review, endorsement and approval). Confirmation of applicability shall be based on the critical analysis of adequacy of the measures providing safe and correct operation and shall be performed in compliance with the established procedures. The most important documents shall be agreed with VATESI.

19.3.3. Availability of the procedures to the relevant nuclear installation staff

All documents and records are accounted in a special electronic system ARKI and registered in a special electronic system @vilys. On one hand the specified systems ensure retention of documents soft copies, and on the other hand access of all INPP users to all valid documents.

At development, accounting and registration of documents, their identification based on assessment of importance of each document in relation to safety is foreseen.

Plant personnel use only the documents passed review, approval and registration. All key personnel have the possibility to use ARKI and @vilys systems to search for any required document.

The originals of the documents and records are stored in within the established storage time. Documents and records, related to safety are stored for the period of operation. Elimination of the documents and records not in action anymore and their archiving shall be performed in accordance with the established procedures. Access to the archive documents and records shall be provided in accordance with the relevant procedures.

Reproduction of the records is ensured considering any and all changes of the documentation preparation which may take place in the future in course of information system modifications. All documentation with the expired term of validity and storage at INPP shall be considered by the expert committee before they decide to hand it over to the State archive for permanent storage or disposal. These decisions shall be documented, approved by INPP General Director and stored permanently.

19.3.4. Involvement of relevant nuclear installation staff in the development of procedures

Preparation of documentation at INPP is carried out by competent personnel of enterprise subdivisions according to the Procedure of Documents and Data Records Management, MS-2-002-1, DVSta-0211-1 and other established procedures regarding:

- documentation development;
- confirmation of documents acceptability;
- independent documents review;
- documents support.

Documents developers and managers of the relevant subdivisions of the enterprise ensure observance of obtainable accuracy, operational authenticity and acceptability of the document under development.

Confirmation of acceptability of the documents is carried out by the competent personnel of the power plant subdivisions, including operational, repair and operating personnel, prior to carrying the document into effect and includes revision, approval, coordination, independent review and validation of the document.

Confirmation of acceptability of documents is performed in accordance with graded approach principle and is based on critical analysis of sufficiency of measures which ensure safe and

correct operation of equipment and systems. The results of the performed acceptability conformation are documented and stored together with original of the document. If coordination of the document by the regulating authority is required, it shall be obtained prior to carrying the document into effect.

Documentation is registered using relevant computer software; information on registration is stored in electronic archive of documents account system ARKI and computerized document management system @vilys.

19.3.5. Incorporation of operational procedures into the management system of the nuclear installation

See Section 13.3.

19.3.6. Regulatory review and control activities

VATESI in accordance with the established responsibilities and national regulations for the verification of safety of nuclear facilities day-to-day carries out supervision/inspection activities and systematic safety assessment to verify that the Authorized party and license holder is in compliance with the regulatory requirements and with the conditions specified in the authorization/license.

VATESI supervises the activities of in-service inspection and testing at Nuclear Facilities:

- Review and approval of Standard in-service inspection and testing regulation and programmes of INPP;
- Review of annual in-service inspection and testing programmes of INPP;
- Review and assessment of annual in-service inspection and testing results of INPP;
- Review, development and approval of in-service inspection and testing regulations;
- Review and approval of in-service inspection and testing methodologies and procedures;
- Review of the results of material investigation of INPP components and pipelines;
- Review and consideration of safety justification in case of deviations from in-service inspection and testing acceptance.

19.4. Article 19(4) – Procedures for responding to operational occurrences and accidents

19.4.1. Overview of arrangements and regulatory requirements on procedures for responding to anticipated operational occurrences and accidents

The main requirements on procedures for responding to anticipated operational occurrences and accidents are established in nuclear safety requirements BSR-2.1.2-2010 “General safety requirements for NPP with RBMK-1500 reactors”. These requirements establish safety goals, guidelines and basic safety criteria, as well as the basic principles and the nature of the technical and organizational measures for the nuclear power plants with RBMK-1500 type reactors. The BSR-2.1.2-2010 obligate the licensee to prepare a set of operating procedures, including procedures for responding to anticipated operational occurrences and accidents as well as special guidelines for management of beyond design basis accidents before the beginning of operation.

The nuclear safety requirements BSR-2.1.2-2010 since 2010 substituted the nuclear safety regulation VD-B-001-97 “General Regulations for NPP Safety”.

19.4.2. Establishment of event based and/or symptom based emergency operating procedures

The event-based accident procedure “Instruction on Elimination of Emergency Situations and Accidents at Ignalina NPP” was developed for INPP Units 1 and 2 for the purpose to define INPP personnel actions at elimination of emergency situations and design accidents as well as the order of cooperation and responsibility distribution during performance of these actions.

In 2012 the planned review of the "Instruction on Elimination of Emergency Situations and Accidents at Ignalina NPP" was performed with introduction into it of the actions at the violation of the new established safe operation limits on Cs-137 activity in SP water, on water temperature and level in the INPP power units 1 and 2 SP.

Special Symptom Based Oriented Accident Instructions (SOAI), Emergency Support Instructions (ESI), and support procedures were developed at INPP in addition to the existing event accident procedures and introduced in 2001. Currently, after INPP Unit 2 shutdown and cooling, the effect of the abovementioned procedures is suspended in accordance with the procedure established at INPP, and they were removed from the INPP personnel working places since the area of application of these procedures was unit power operation.

19.4.3. Establishment of procedures and guidance to prevent severe accidents or mitigate their consequences

Special guidelines for management of beyond the design basis accidents (SAMG/RUZA) were developed and introduced at INPP in 2008.

In 2008, the "Emergency Preparedness Requirements for the Organization Operating the Nuclear Facility", P-2008-01, developed by VATESI were put into effect at INPP. Currently, the "Plan of the Nuclear Accident Prevention and the Accident and its Consequences Elimination at the State Enterprise Ignalina Nuclear Power Plant" and its working procedures are being reviewed basing on the specified requirements. The fact that Unit 2 reactor was finally shutdown on 31 December 2009 and that the new organizational structure of the enterprise is valid at INPP in 2010 is also taken into account at the review.

In 2010, the beyond design-basis accidents management guidelines were reconsidered taking into account that on December, 31st, 2009 power unit 2 reactor was finally shut down.

After the accident at the Fukushima Daiichi Nuclear Power Plant, happened on March, 11th 2011, within the scope of performance of activities according to "Stress tests performed on European nuclear power plants as a follow-up of the Fukushima accident", Country peer review of Lithuania, Final Report, March 2012, ENSREG, the following activities focused on increase of SF safety in power units 1 and 2 SFSP have been developed and implemented at INPP:

- Preparedness of the INPP equipment, procedures and personnel for actions during unauthorized loss of water from MCC and SFSP has been checked, accident-prevention training on the topic "Unauthorized Reduction of Water Level in MCC and SFSP" has been carried out for all operation personnel shifts.
- Preparedness of the INPP equipment, procedures and personnel for actions at the blackout of the INPP power units auxiliaries.
- The analysis and assessment of the storage pools I&C (water level and temperature measurement detectors, and SPH radiation level measurement detectors) working capacity in conditions of beyond design-basis accidents have been performed.
- The analysis of the possibility of the equipment damage as a result of hydrogen accumulation and explosion, as well as flooding of rooms has been performed.
- The analysis and assessment of the possibility and safety of carrying out of emergency recovery works in case of beyond design-basis earthquake and damage of ISFSF building constructions have been performed.
- Data transmission from the seismic warning and monitoring system to the reserved control room (RCR), to the technical support centre (TSC) and accident management centre (AMC) for the seismic conditions in the region monitoring in case of earthquakes and accidents has been organized.
- Justification of application of the strategy of absorber delivery to emergency SP has been developed for power unit 1 (at power unit 2 it was realized in 2008).
- Modification on delivery of service water to power unit 1 SP at beyond design-basis accidents has been developed and implemented (at power unit 2 it was realized in 2008).

- Modification of the diagram of the water in SP temperature measurement, as well as the diagram of the SP water temperature and level I&C power supply from mobile DG at the blackout of INPP auxiliaries has been developed and implemented (at power unit 2 it was realized in 2008).
- The programme of testing of the diagram of water delivery from lake Drūkšiai from fire-fighting vehicles to power unit 2 SP has been implemented, the corresponding strategy has been developed and introduced in the Instruction. Beyond Design-Basis Accidents Management Guideline RUZA-B. INPP Units 1 and 2 Storage Pools Condition Management.

At present implementation of the following activities is proceeding at the INPP:

- Performance of assessment of radiological consequences of the SF cask tip over during its transportation from the INPP power units to the interim spent nuclear fuel storage facility (ISFSF) in case of beyond design-basis earthquake.
- Performance of calculations of the accident management centre (AMC) building constructions stability to the beyond design-basis earthquake.
- Implementation of modification on provision of monitoring of the water temperature and level in power units 1 and 2 SFSP at MCR-2, in TSC and EPO AMC.
- Implementation of modification on provision of monitoring of the water level in power units 1 and 2 SFSP below design-basis limits.

The results of the stress tests performed at INPP are presented in the National final report on "stress tests", Vilnius, 2011, completion of all activities on stress tests is planned for 2014.

All the necessary changes after agreement with VATESI have been introduced in INPP Emergency Preparedness Plan (General Plan), working procedures of emergency preparedness and beyond design-basis accidents management guidelines. At present the set of beyond design-basis accidents management guidelines include:

- Instruction. Beyond Design-Basis Accidents Management Guideline RUZA-R1. Provision of Heat Removal from INPP Unit 2 Reactor;
- Instruction. Beyond Design-Basis Accidents Management Guideline RUZA-RB. Reduction of INPP Units 1 and 2 Fission Products Emission;
- Instruction. Beyond Design-Basis Accidents Management Guideline RUZA-B. INPP Units 1 and 2 Storage Pools Condition Management;
- Instruction on the Provision of Emergency Heat Removal from Unit 2 Reactor in Case of INPP Full Auxiliaries Blackout.

19.4.4. Regulatory review and control activities

In 2011, the INPP corrected the violation and non-compliance that had been established during the inspection conducted by VATESI in 2009, and modified the guidelines for managing beyond design basis accidents. The modified guidelines for managing beyond design basis accidents defends the accident management strategy C19, which will be implemented in managing very unlikely beyond design basis accidents related to the formation of criticality in the spent fuel pools of the INPP Unit 1 (e.g. in the case of dropping heavy weight equipment into the pool or the earthquake) and mitigating the effects of these accidents. VATESI specialists reviewed and assessed the INPP modified guidelines for managing beyond design basis accidents and the safety justification. To verify the feasibility of implementing the accident management strategy C19, the inspection *Verifcation of Accident Management Processes at the State Company Ignalina Nuclear Power Plant* was conducted on 30 November 2011.

In 2012, by conducting the planned inspections at the INPP, VATESI specialists inspected the accident management measures at the INPP. Special attention was given to the prevention and management of the beyond design basis accidents in the spent fuel storage pools in the INPP Unit 1 and Unit 2. The inspection commission found that the portable diesel power generator, which has to be used in managing the beyond design basis accidents, is in good technical condition, its tests and

maintenance are carried out in line with the relevant instructions.

In December 2012, VATESI specialists conducted an inspection of the INPP emergency preparedness. Inspection was concentrated on the assurance of the emergency preparedness by the INPP after implementing the measures of the Safety Improvement Programme SIP-3/2012 and the analysis of training process at the Emergency Preparedness Organisation. Additionally the premises and work places of the protected Accident Control Centre of the Emergency Preparedness Organization were inspected, the existing documentation was examined, and the available equipment and personal protection means were verified. The INPP representatives presented the reconstructed premises of the protected Emergency control centre, the automated alarm system for water leakage detection and the installed retransmitters-amplifiers for mobile communication.

In discussing other additional issues, VATESI specialists informed the INPP that the Final Report of the Emergency Preparedness Review (EPREV) Mission in Lithuania will be approved in 2013, and the recommendation to update the classification of emergencies for the nuclear facilities will be provided in the Report. The INPP will have to take this into consideration in preparing a new version of the emergency preparedness plan. In addition to that, it was pointed out that in performing the full-scale emergency preparedness exercise it would be useful to involve the municipalities located near the INPP.

No violations were identified during the inspection. Several non-compliances were found, and the INPP was obligated to remove them by the set deadlines.

19.5. Article 19(5) – Engineering and technical support

19.5.1. General availability of necessary engineering and technical support in all safety related fields for all nuclear installations, under construction, in operation or under decommissioning

Technical and scientific support is provided by INPP designers (INPP General Designer, St' Petersburg, Russia) and by the designers of the reactor (reactor General Designer – NIKIET and Research Manager – Kurchatov Institute, Moscow).

19.5.2.General availability of necessary technical support on the site and also at the licence holder or utility headquarters, and procedures for making central resources available for nuclear installations

After the new organizational structure of year 2010 and 2012 has been introduced, several specialized divisions providing engineering support to the power plant subdivisions at the INPP.

The Nuclear Fuel Safety Department is in charge of all issues related to nuclear safety, fuel and the core.

The Operational Management and Engineering Support Department ensures support to the power plant subdivisions in the following activity:

- Solving of engineering problems related to safe and economical operation of INPP systems and facilities, development and introduction of the plant modifications and isolations, and also related to repair of INPP Units 1 and 2 technological systems and equipment at all defueling stages;
- Engineering support of ventilation and air conditioning systems, heat supply and INPP buildings and facilities heating systems, service water supply systems and systems of gas and air supply to INPP industrial site consumers;
- Vibration-based diagnostics of diesel generators, turbine compressors, pumps and fans of INPP Units 1 and 2 and industrial site buildings according to the schedule for on-technical condition repair and at their putting into operating condition after repair;
- Heat monitoring and assessment of the state of process equipment and systems; tracing of buildings and facilities heat leak spots;
- Organization and implementation of the equipment and safety related systems aging

management programme within the framework of Units 1 and 2 licensing conditions;

- Coordination and support of activity between INPP subdivisions related to assessment and use of own and industrial experience;
- Solving of engineering problems related to introduction of new INPP Units decommissioning facilities;
- Development of recommendations on saving of electric and heat energy in INPP buildings;
- Maintenance of INPP safety improving programme;
- Organization of inspection of the equipment and facilities maintenance system (including organization of contract works) in the maintenance services of the TS subdivisions, preparation of the summary report, control of performance of the scheduled activities on elimination of the discovered non-conformities;
- Development of the plan of objectives and tasks of the TS subdivisions maintenance services at defueling stages 1 and 2, analysis of their performance results;
- Planning and analysis of Units 1 and 2 maintenance costs (materials and equipment and maintenance service contract works);
- Analysis and control of execution of annual and monthly equipment and facilities maintenance service production plans by the plant subdivisions;
- Development of week-and-daily and shift-and-daily tasks for major works on equipment repair carried out by subdivisions during the joint repair.

The Design Department supports the plant departments in the area of equipment repair technologies development and design works

The Documentation Management Department provides support to the plant department in the area of technical documentation management.

19.5.3. General situation with regard to dependence on consultants and contractors for technical support to nuclear installations

At the INPP the services on design, development, production, delivery of equipment and systems, materials and spare parts, contracted works of technical support organizations having permission to complete works and services at INPP are procured in accordance with Procurement Management Procedure, MS-2-017-1, DVSta-1711-1.

Independent examination of the most important modifications is carried out by technical support organizations according to Procedure of Power Plant Modifications Management, MS-2-016-1, DVSta-1611-1. Assessment of the design of structures and assessment of structures are performed according to Procedure of Structures Building and Demolition Management, MS-2-026-1, DVSta-2611-1.

For solving of the particular task that demands technical services and means both from internal and external organizations a special group on the project management is organized (for example, an implementation of a new system or procedure, fulfilment of the safety increase program, NPP decommissioning, etc.). The personnel of the INPP structural divisions as well as the personnel of external technical support organizations can be involved in such a group. The group manager is responsible for efficient implementation of the project according to given authority and existing system of Quality Assurance.

In development of technical support projects INPP cooperates with external technical support organizations such as Lithuanian Energy Institute, Kaunas University of technology, Vilnius Institute of Information Technologies, etc. In the Russian Federation the INPP coordinates with Russian Scientific Centre "Kurchatov Institute", main designer of RBMK reactors NIKIET (Russian abbreviation for Research and Development Institute of Power Engineering), designer general of VNIPIET (Russian abbreviation for All-Russia Research and Design Institute of Power Engineering Technology) and other institutes.

19.5.4. Regulatory review and control activities

VATESI performs the inspections of the activities of the INPP related to conducting the external audits at the contractors' organizations involved in the INPP's decommissioning projects. The goal of such inspection is to ascertain how the INPP is performing the assessments (audits) of the management systems of the suppliers that are relevant to safety and the capability of these suppliers to meet the requirements of the procurement documents.

19.6. Article 19(6) – Reporting of incidents significant to safety

19.6.1. Overview of arrangements and regulatory requirements to report incidents significant to safety to the regulatory body

The Law on Nuclear Safety approved by Government of the Republic of Lithuania on 28 June 2011 states the need for licence holders to notify promptly to State Nuclear Power Safety Inspectorate about nuclear and radiological accidents, nuclear incidents and other unusual events occurred at nuclear installations.

Within VATESI Requirements on Operational Experience Feedback in the Field of Nuclear Energy (P-2009-04) it is required from a license holder to prepare procedures with detail reportable event criteria for reporting about the unusual events, including near-misses, accident precursors and abnormal occurrences at all stages in life-time of a nuclear installation.

In 2010 VATESI issued the general requirements BSR-1.8.1-2010 "Notification on unusual events at nuclear power plants", which describe the events reporting criteria, reporting processes to ensure that the information will be provided in timely manner. BSR-1.8.1-2010 include the detail requirements for the analysis of event and content of event analysis report.

System for reporting of unusual events established within INPP is in accordance with national requirements, international practice and IAEA recommendations.

INPP has established event analysis procedures based upon ASSET methodology (IAEA). Human factor related events are additionally analyzed using the special procedure for analysis of events related to erroneous actions of personnel. The event analysis is used to detect all event causes, including root causes and to develop actions for preventing their recurrence. According the INPP procedure detailed event analysis reports and planned preventive actions shall be sent to VATESI and WANO members within 30 days.

INPP has all necessary administrative and technical measures to report about the safety significant events.

In order to provide reportable events to INES databases, the INES national coordinator is nominated at VATESI. He is responsible to conduct the functions of INES national coordinator.

19.6.2. Overview of the established reporting criteria and reporting procedures for incidents significant to safety and other events such as near misses and accidents

The main criteria for reportable events and requirements for notification in timely manner are established within BSR-1.8.1-2010 "Notification on unusual events at nuclear power plants". The reporting criteria include, but are not limited to the following ones:

- violation of limits and conditions for safe operation;
- failure of the barriers important to safety;
- obstacles for personnel to perform work safely;
- unplanned activation of a safety system;
- failure of a system to perform a safety important function;
- unplanned discharge of radioactive materials above the permissible levels;
- any event posing a threat to physical protection of a NPP.

In accordance with BSR-1.8.1-2010 all safety significant events occurred at nuclear facility shall be reported to VATESI in a timely manner: within 24 h to notify about and event and 30 days to present an event investigation report. The information is delivered in accordance with INPP procedure agreed by VATESI. The procedure requires inform VATESI about an event verbally as soon as possible, but not later than within an hour after an event and written notifications must be sent not later than in eight hours on the first working day after an event.

INPP has developed reporting criteria's specific o the type of the plant. Reporting criteria are established in the INPP procedure "Notification on unusual events at Ignalina Nuclear Power Plant instruction" DVSta-0312-8. Reporting criteria are consistent to VATESI requirements.

19.6.3. Statistics of reported incidents significant to safety for the past three years

In 2010-2012, seven reportable events occurred at the INPP, which in accordance with the set information dissemination criteria had to be reported to VATESI (see Table 19.1). As a consequence the occupational exposure of the INPP employees and the contamination of the premises with radionuclides did not exceed the permissible limits, and the radionuclides were not released to the environment. On the International Nuclear Events Scale (INES) all seven events were rated at Level 0 or below the scale.

Table 19.2 presents the total number of events occurred at the INPP in period 2010-2012. Some of events are not satisfy VATESI reporting criteria's, however all 29 events were registered and analyzed, event analysis reports was issued, root causes were identified, corrective measures were developed and implemented at the INPP in order to avoid event occurrences or reoccurrences.

Table 19.1 The Reportable Unusual Events occurred at INPP in 2010 – 2012

Events	Year			Total
	2010	2011	2012	
Reportable events	1	3	3	7

Table 19.2 The Unusual Events Significant to Safety occurred at INPP in 2010 – 2012

Events	Year			Total
	2010	2011	2012	
Safety related	1	1	2	4
Non safety related	5	5	15	25
Total	6	6	17	29

19.6.4. Documentation and publication of reported events and incidents by both the licence holders and the regulatory body

INPP maintains database of event to facilitate the analysis and to inform departments. The INPP database supports producing of investigation reports by providing of electronic templates compatible with the ASSET methodology. As soon as the first draft of a report is ready it can be easily retrieved from the system and reviewed by the members of an event investigation team. Necessary changes can be done to the report at this stage by the investigation team. The final version of such a report becomes accessible to all departments after receiving the "approved" status. The system provides no possibility to change the content of the report after its approval by the leader of the investigation team.

All event analysis reports from INPP are collected, handled and stored at VATESI database of unusual event so that it is possible to carry out a systematic search, selection and evaluation of events and their trends. National Co-ordinator of Lithuania at VATESI is responsible for selection, preparation of national reports on safety related events and for setting to international databases: IAEA/NEA IRS or NEWS databases respectively.

19.6.5. Policy for use of the INES scale

In accordance with the Law on Nuclear Safety approved by Government of the Republic of Lithuania on 28 June 2011 VATESI is an institution authorised by the State to communicate and obtain information according to the 1986 Convention of Early Notification of a Nuclear Accident, according to 87/600/EURATOM Council Decision of 14 December 1987 on Community Arrangements for the Early Exchange of Information in the Event of a Radiological Emergency and according to the intergovernmental bilateral treaties. The licence holders must promptly notify the State Nuclear Power Safety Inspectorate of the occurring nuclear and radiological accidents, nuclear incidents and other unusual events.

The unusual events in nuclear installations and in activities involving the use of nuclear and/or nuclear fuel cycle materials are classified by the licence holder in accordance with the IAEA International Nuclear and Radiological Event Scale (INES). Independently from the licence holder the State Nuclear Power Safety Inspectorate analyse the unusual events and based on the conducted analysis finalise the approval of their classification. All reportable events for national and international communication are classified according to INES User's Manual edition in 2008.

19.6.6. Regulatory review and control activities

The event reporting arrangements at INPP are regularly assessed by VATESI in the frames of supervision of the system of operational experience feedback. The effectiveness of the system is evaluated during annual inspection and review of corresponding submittals, including event reports, delivered following VATESI requirements P-2009-04. The regulatory activities include follow-up of the licensee's corrective actions identified as a result of event investigation.

19.7. Article 19(7) – Operational experience feedback

19.7.1. Overview of arrangements and regulatory requirements on the licence holders to collect and analyse and share operating experience

In accordance with the Law on Nuclear Safety approved by Government of the Republic of Lithuania on 28 June 2011 the licence holder shall analyse its own and external operation experience of the nuclear energy field as well as to exchange such operational experience whit other interested parties and take necessary preventive and/or corrective measures that would ensure proper performance of nuclear safety requirements in the manner prescribed by the Head of VATESI.

With a purpose to strengthen and enhance the operational experience feedback processes VATESI has issued regulatory document "Requirements on Operational Experience Feedback in the Field of Nuclear Energy" (P-2009-04). Requirements (P-2009-04) are applied to licensee holder and describe the main requirements for:

- operational experience feedback system,
- identification, reporting, screening and analysis of information on operational experience,
- analysis of the trends of events
- collection useful information on operational experience and dissemination of lessons learned,
- assessment of the effectiveness of the operational experience feedback system.

In accordance with the requirements (P-2009-04) operational experience shall be systematically exercised in all stages of the lifecycle of a nuclear installation.

The detailed requirements for events investigation, notification, reporting criteria's of events are established in the regulatory requirements BSR-1.8.1-2010 "Notification on unusual events at nuclear power plants".

19.7.2. Overview of programmes of licence holders for the feedback of information on operating experience from their own nuclear installation, from other domestic installations and from installations abroad;

The INPP has developed operating experience system and special procedures, respectively VATESI regulations BSR-1.8.1-2010 „Requirements of notification on unusual events in nuclear power plants“ and “Requirements on Operational Experience Feedback in the Field of Nuclear Field” (P-2009-04).

The purpose of the use of operating experience is to increase the safety and reliability of the INPP. The activity on the use of internal and external operational experience at INPP is carried out according to the general management procedure “Use of operational experience management procedure” (MS-2-003). In accordance with the regulations mentioned above INPP has developed and established procedures as following:

- “Notification on unusual events at Ignalina Nuclear Power Plant instruction” DVSta-0312-8 defines the appropriate reporting criteria for events specific to the plant and communicating processes,
- “Instruction for event analysis”, DVSta-0312-5 describes the methods for event analysis and event analysis processes ant Ignalina NPP,
- Regulations for Group of Operating Experience analysis and control, DVSed-0325-1;
- “The handling with the proposals of INPP employees”, DVSta-0308-1.

The operational experience use at the INPP is ensured by the following means:

- the competent personnel, whose authorities and responsibilities are defined in the power plant documentation,
- availability of the procedures describing and defining various actions: screening information on operational experience, evaluation of applicability, event analysis, planning and documenting of results, development of corrective actions, monitoring of the corrective actions
- allocation of the resources necessary for realization of activity on the use of own and operational experience.
- safety performance indicator system developed at the INPP is a part of the operating experience. Relevant to the decommissioning stage indicators have been renewed sins 2010 and is under applications at the INPP,
- the categorization (coding by WANO) system for the monitoring of the trends are developed and used at the INPP with aim to assess the effectiveness of the use operational experience. The monitoring comprise the faults of equipment, drawbacks in the employees’ operations, descriptions of the procedures, organizational weaknesses as well as the data characterizing the conditions that were present during the events (near-miss events).

In order to assure operational experience use and feedback the INPP uses various information sources:

- Information of own operational experience: event analysis reports, low level events, the near misses events, the proposals of INPP employees, the business trips reports, the reports of the carrying out emergency and fire-fighting exercises;
- an operational experience of the NPPs with RBMK reactors;
- WANO and IAEA (IRS and FINAS) information;
- the information of projectors, designers, suppliers, manufacturers;
- reports on external evaluations, including VATESI inspections, reports on carrying out of WANO peer review, reports on carrying out of international missions (ASSET, OSART, etc.)

Special attention is paid to safety issues and lessons learned related with decommissioning of other NPPs.

In order to strength the operational experience feedback the information at INPP is collected, handled and stored using a special database allowing to carry out systematic search, selection and evaluation.

19.7.3. Procedures to analyse domestic and international events

To prevent possible events at Lithuanian nuclear facilities and to avoid occurrences and reoccurrences of similar events happened in the worldwide VATESI analyzes domestic and international operational experience including information on unusual events. VATESI performs review, screening and analysis of information on events available thought IAEA International Reporting System for Operating Experience (IRS), Fuel Incident Notification and Analysis System (FINAS), information on events gained through Clearinghouse web-page, NRC web-page and other available sources.

VATESI has Permanent Commission of Unusual Events and Operational Experience (hereinafter – the "Commission"), which analyses international events and the unusual events occurred at Lithuanian nuclear facilities. The meetings of Commission are organized monthly at VATESI.

In accordance with VATESI regulation document "Requirements on Operational Experience Feedback in the Field of Nuclear Field" (P-2009-04), all safety significant events as well as the events that may impact long-term safe operation of the nuclear installation shall be thoroughly investigated, their direct causes and root causes shall be identified, the impact on safety and potential consequences shall be assessed, and the corrective actions shall be established. Based on the results of the investigation, the managers of the nuclear facility shall be provided with specific recommendations regarding the corrective actions that have to be taken immediately.

INPP has issued and uses a special procedure "Instruction for event analysis" DVSta-0312-5, which describes and procedures for event analysis occurred at INPP, procedures for root causes estimation, use of ASSET methodology for event investigation, development of corrective measures, event classification by INES, preparation of event analysis and other procedures related with event analysis and event analysis report preparation are included. "Instruction for event analysis" DVSta-0312-5 includes procedures of analysis of low level events and near-misses events in order to prevent them occurrence or reoccurrence.

The operational experience at INPP is analyzed by qualified INPP specialists who are experienced in all areas of operation of the NPP. Analysis of events is carried out by the personnel that is competent to apply the event investigation methods.

In order to identify relevant to the INPP safety related issues and adopt the lessons learned at INPP the special "Group of Operating Experience analysis and control" are constitute at INPP. This Group performs analysis if information on operating experience as well as domestic and international events.

19.7.4. Procedures to draw conclusions and to implement any necessary modification to the installation and to personnel training programmes and simulators

Application of operational experience at the INPP is evaluated in a systematic way in order to reveal eliminate any weaknesses and improve its effectiveness. To determine the effectiveness of the use of operational experience, self-assessments are periodically performed (internal inspections, audits, walk down, surveillances) and external assessments (VATESI inspections, ASSET and OSART missions, WANO peer reviews). On the basis of the analysis of the operational experience (investigation of the event, evaluation of the trend, analysis of the external operational experience feedback and other) the corrective actions are prepared with a final target to improve the safety of INPP.

The use of operational experience is a part of other INPP programmes, e.g. equipment maintenance programmes are developed with consideration of analysis of maintenance and operational experience, information submitted by designers and by manufacturers; programmes for optimization of radiation exposure are composed taking in to account the analysis of radiation exposure in the previous years, content and scope of work, VATESI requirements.

The operating experience is used in training for of control room operators and other INPP personnel at INPP Training Centre. The data considered applicable to the plant are analysed and

incorporated into training programmes.

19.7.5. Mechanisms to share important experience with other operating organizations

According VATESI requirements, INPP has contacts and cooperates with the legal entities which took part in designing the nuclear installation or in manufacturing the safety-important structures, systems or components which rendered services and carried out works related to safety in order to get consultations in the cases of equipment faults or events.

The mechanisms to share important experience with operating organizations are established in the INPP management procedure "Use of operational experience management procedure" (MS-2-003).

Whit a purpose to ascertain that all persons supplying goods, rendering services or performing works to INPP are efficiently using the operational experience in their activities the communication with contractors are maintained. INPP exchanges important operational experience with other operating organizations. The important experience is disseminate thought WANO.

19.7.6. Use of international information databases on operating experience

The licensee has defined the procedures for the assessment and usage of the information obtained from other nuclear installations, nuclear safety regulatory institutions and other sources, including IAEA/NEA IRS, FINAS databases and WANO.

19.7.7. Regulatory review and control activities for licence holder programmes and procedures

In order to assure proper operational experience usage VATESI plans and performs inspections at INPP every year. VATESI controls the licence holder's operational experience feedback arrangements and use of the lessons learned by performing regulatory inspections and reviewing the corresponding submittals delivered to the regulatory body according to regulations.

VATESI performs review of events analysis and notification the procedures, internal and external operational experience feedback procedures, safety performance indicators system and other procedures related with operational experience feedback.

19.7.8. Programmes of the regulatory body for feedback of operational experience and the use of existing mechanisms to share important experience with international organizations and with other regulatory bodies

In accordance with VATESI internal Quality Assurance procedure "The procedure on the activity and right of the Commission of Unusual Events and Operational Experience" VATESI has a permanent Commission of Unusual Events and Operational Experience, which systematically performs review, screening and analysis of information on operational experience. The event analysis reports are assessed and analyzed with a purpose to identify safety related issues, adopt the lessons learned in order to avoid the reoccurrences of events and for improve the regulatory requirements. Recommendations developed by Commission are provided to license holder. In accordance with VATESI "Requirements on Operational Experience Feedback in the Field of Nuclear Power" (P-2009-04) license holder provide VATESI reports on use operational experience and lessons learned, including information on implementation of recommendations of VATESI.

Identifying of relevant operating experience information includes the review of the international databases, such as:

- IAEA International Reporting System for Operating Experience (IRS);
- Fuel Incident Notification and Analysis System (FINAS);
- World Association of Nuclear Operators (WANO).

VATESI uses the different ways for information to share own experience. The information on lessons learned and important experience is disseminated trough international databases such as IAEA IRS and USIE. The important information for the public and international organization is published

into VATESI own webpage www.vatesi.lt.

VATESI take a part in the Clearinghouse activity to improve the operating experience feedback and communication between participating countries.

19.8. Article 19(8) – Management of spent fuel and radioactive waste on the site

19.8.1. Overview of arrangements and regulatory requirements for the on-site handling of spent fuel and radioactive waste

Strategy on Radioactive Waste Management was approved by the Government of Lithuania in 2002. In 2008 the Strategy was revised. Compared with previous and revised strategies, there are no changes in main strategic. The difference is that the strategy has been restructured and some elements were reworded. This Strategy was approved to implement the provisions of the Law of the Republic of Lithuania for Radioactive Waste Management, which establishes the basic principles of Radioactive Waste Management.

The strategy has three main objectives: 1) Strive to achieve a high level in nuclear and radiation safety in management of spent fuel and radioactive waste; 2) To improve the radioactive waste management infrastructure, which shall be based on modern technologies; strive to minimize activity and volume of radioactive waste; 3) Informing the Lithuanian public to achieve a better understanding of the main radioactive waste management principals and achieve acceptance of waste management projects.

INPP has developed activities on implementation of the Regulation on the Pre-disposal Management of Radioactive Waste at Nuclear Facilities issued by VATESI. Thus, implementation of those activities enables INPP to modernize radioactive waste management to treat radioactive waste considering new requirements, which take into account interdependence of all radioactive waste management phases and new classification of waste.

The General Requirements for Dry Type Storage for Spent Nuclear Fuel issued by VATESI sets out general requirements for spent fuel storage. These requirements as well as Regulation on the Pre-disposal Management of Radioactive Waste at Nuclear Facilities were revised taking into account WENRA safety reference levels prepared by working group on waste management and decommissioning (WGWD) and also taking into account new IAEA recommendations.

19.8.2. On-site storage of spent fuel

The intermediate nuclear fuel storage facility (build. 192) is located on the INPP site in the distance of 1 km of the available plant units and 400 meters of Drūkšiai Lake. 20 CASTOR and 88 CONSTOR RBMK-1500 casks with 51 spent nuclear fuel assemblies in each were stored in this facility up to 2009. According to accomplished modernization that extended the capacity of the spent nuclear fuel storage facility, at the beginning of 2009 VATESI gave permission to INPP to place in it additionally 12 CONSTOR RBMK-1500 casks. 10 CONSTOR RBMK-1500 casks with spent nuclear fuel were transported to the spent nuclear fuel storage facility at the period of 2009. The total amount of stored casks – 118 and the total quantity of spent nuclear fuel assemblies accommodated in the casks – 6018. Transportation of 2 remaining casks with spent nuclear fuel to the storage facility is not anticipated.

Under the necessity to handling and store of the other approximately 17000 spent nuclear fuel assemblies from closed INPP, it is obvious that existing spent fuel storage facility is not sufficient. At 2003 Lithuanian Government decided to construct a new dry type spent nuclear fuel storage facility (project B1) designed for handling and store of the other spent nuclear fuel assemblies.

The new intermediate nuclear fuel storage facility site is located in the distance of 0.6 km of INPP to the south. The contractor of the project B1 is German company Nukem Technologies. The contractor enhanced the design of CONSTOR RBMK-1500 casks. CONSTOR RBMK-1500/M2 cask consists of 2 baskets and can accommodate of 91 spent nuclear fuel assemblies. The new spent new fuel storage facility, according to the project, is designed to accommodate 200 CONSTOR RBMK-

1500/M2 casks with spent nuclear fuel assemblies and store it up to 50 years. The required spent nuclear fuel handling equipment is designed too. It is foreseen to construct new intermediate nuclear fuel storage facility, due to delays of project B1 implementation, up to 2014. Project B1 is delayed for several years. Delays were caused by disagreements between INPP and Nukem Technologies. As for now those disagreements are about to be resolved and implementation of the project should be speeded up.

19.8.3. Implementation of on-site treatment, conditioning and storage of radioactive waste

Solid radioactive waste at INPP is segregated into three groups by the surface dose rate, according to standards that were applied in a former Soviet Union and applicable at INPP. The solid waste at INPP is dumped into reinforced concrete compartments in storage buildings No. 155, 155/1, 157, 157/1 located on INPP site. There is no reprocessing of solid waste before it is dumped. All the waste from these facilities will be retrieved, characterized and conditioned according new requirements mentioned before.

Liquid radioactive waste at the INPP is collected in special tanks, from where it is directed to evaporating facilities. The concentrate is processed and conditioned in the bitumen solidification facility, i.e. mixed with bitumen. The bitumen compound then is pumped into a special storage facility (build. 158). The building is also located on the INPP site. The INPP performed preliminary study for bituminised radioactive waste storage facility in order to know if it could be converted into a repository or not. It was decided that more investigations are needed. If an outcome of final assessment is negative, build. 158 will remain as a storage facility and the INPP would develop actions plan of facility decommissioning including waste retrieval. If positive then this storage facility will be transferred to disposal facility. In 2012 periodic assessment for this storage facility was performed.

Spent ion-exchange resins are stored in special tanks. In 2006 the cementation facility and storage facility for cemented waste started operation. The ion-exchange resins from the INPP water purification and liquid waste treatment systems together with filter aid (Perlite) as one waste mixture type and solid particle sediments from evaporator concentrate also with filter aid (Perlite) as another waste mixture type is to be solidified in cement which is poured into drums and put in storage container (waste packages) in order to reduce any further risk associated with the liquid waste storage in tanks and to assure safe storage and management of solidified waste. A new storage facility for cemented waste is designed for 60 years storage. Conditioned waste will be disposed in near surface disposal facility.

Modernization of waste management includes retrieval from old storage facilities, characterization, treatment and conditioning of waste taking into account disposal routes. Before disposal waste will stored in new storage facilities. In new treatment facilities operational and decommissioning waste will be managed. It is assumed that retrieval of the waste and operation of new treatment facilities could start in 2014-2015. The implementation of this project is delayed for several years. Delays were caused by disagreements between INPP and Nukem Technologies. As for now those disagreements are about to be resolved and implementation of the project should be speeded up.

After storage the waste will be disposed of in disposal facilities. It is envisaged to construct two disposal facilities – one for very low level and other for low and intermediate level radioactive waste. According plans very low level waste disposal facility could start operation in 2014 and disposal in low and intermediate level radioactive waste disposal facility in 2015-2016. Disposal of high level waste is not resolved yet.

Before sending of the very low level waste to disposal facility it will stored at very low level waste facility which capacity is 4000 m3. This facility starts its operation in 2013.

19.8.4. Activities to keep the amount of waste generated to the minimum practicable for the process concerned, in terms of both activity and volume

According new regulation on predisposal management of radioactive waste, INPP shall keep the generation of radioactive waste to the minimum practicable, in terms of both activity and volume, using best available technology without involving excessive costs. For this moment INPP optimized processes of waste generation which allowed reduce amount of waste.

For minimization purpose was constructed installation for free release of solid operational radioactive waste. It started operation in 2006. After measurements in this installation part of the waste can be treated as non-radioactive and can be stored in ordinary refuse tip for non-hazardous waste. In 2013 - 2014 this facility is supposed to be modernized for characterization of waste of decommissioning.

Another free release facility is constructed for decommissioning waste, which started operation in 2010. For the period from 2010 to 2012 more than 5800 t of waste were removed, utilized on the dumps outside the INPP.

19.8.5. Established procedures for clearance of radioactive waste

Requirements BSR-1.9.2-2011 “Derivation and Use of Clearance Levels of Radionuclides for Materials and Waste Generated during Activities in the Area of Nuclear Energy” are established. According these requirements the INPP performs measurements of the material which could be cleared. This is done in the facilities mentioned in Section 19.8.4.

19.8.6. Regulatory review and control activities

Main steps of regulatory review are related to the steps of development of waste management facility design, construction or reconstruction, operation and decommissioning or closure. In order to receive a licence operator shall provide safety documentation which shall reviewed by regulatory body. When licence is issued regulatory control is ensured by control of following of licence conditions and regular on-site inspections.

SUMMARY

The following activities were performed during reporting period:

- EU stress tests were conducted;
- Continued implementation of Safety Improvement Programme;
- Safety assessment and decommissioning activities;
- Further implementation of decommissioning projects related to the safety of spent fuel and radioactive waste management (with delays of some projects for several years);
- Lithuania legal and regulatory reform;
- Development of a new nuclear safety regulations;
- VAE prepared VNPP Site Evaluation Report;
- Review of VNPP Site Evaluation Report by Independent IAEA Site Safety Review Mission.

S.1. Actions taken in the light of the Fukushima Daiichi accident

S.1.1. Results of reassessments of external events, of periodic safety assessments and of any peer reviews, and any follow-up actions taken or planned, including upgrading measures

The European Council of 24/25 March 2011 stressed the need to fully draw the lessons from the events related to the accident at Fukushima Daiichi Nuclear Power Plant, and to provide all necessary information to the public. The European Council decided that all EU nuclear power plants should be reviewed, on the basis of a comprehensive and transparent risk and safety assessment (stress tests). The European Commission and the European Nuclear Safety Regulators Group (ENSREG) on 24 May 2011 confirmed the specification of declaration which defines the technical scope and the process of performance of the stress tests and their review.

Lithuania as the European Union Member State having nuclear fuel on INPP site in 2011 – 2012 conducted the stress tests and participated in a whole process of peer review: self-assessment by licensee (action INPP final report on stress tests), review of the self-assessment by national regulator (action of National final report on stress tests by VATESI), peer reviews of the national stress tests reports, conducted by national and European Commission experts (action of Country peer review draft report of Lithuania), country review of Lithuania, conducted by experts delegated from ENSREG (finalising of the Country peer review report of Lithuania).

In response to the declaration stress tests were performed for two INNP power units, the Dry Spent Fuel Storage (DSFS) and the new Interim Spent Fuel Storage (ISFS) facilities, taking into account as well as results of assessment performed by the licensee in 2012 in-line WANO recommendations.

Within the scope of the stress tests the following issues were analysed: earthquake, flooding, extreme weather conditions, loss of electrical power and loss of the ultimate heat sink and severe accidents management.

The results of the stress tests revealed that the INPP has implemented the relevant technical and organizational measures which would be adequate to control the emerging situation to maximally protect the people and the environment from the hazardous effects of ionizing radiation even in the most adverse conditions, such as the earthquake, flood, extreme weather conditions, long-lasting interruption of power supply, long-lasting failure of the spent nuclear fuel cooling systems.

With an aim to further upgrade the level of safety, with regard to the summary report on the peer review of the stress tests approved by ENSREG, the conclusions and recommendations provided by the international peer review experts group as well as the additional comments by VATESI, INPP prepared the plan of the stress tests safety improvement measures and agreed it with VATESI in May 2012.

With regard to the ENSREG Action Plan adopted by ENSREG on 25 July 2012, which will assist in assuring that the conclusions from the stress tests and their peer review result in improvements of safety across European nuclear power plants, VATESI has developed and approved in 2013 its plan for upgrading of nuclear safety in Lithuania (National Action Plan of Lithuania) associated with post-Fukushima lessons learned and stress test peer review recommendations and suggestions. According to this plan, the existing nuclear safety requirements and other legal acts will be revised, and, if necessary, the new ones will be drawn up.

The measures listed in the plan for upgrading of nuclear safety is planned to implement in 2013-2015 and include actions demand additional studies and assessments, several imply procedural revisions and review of regulations, while some demand hardware modifications, such as new measurement systems for the spent fuel pools. More details on measures included in the plan for upgrading of nuclear safety in Lithuania and status of measures implementation (as of date 6 August 2013) are presented in Table S.1.

General Conclusions and Recommendations

Earthquake

The reactor building structures, systems and components that ensure safety of the fuel storage in the Unit 2 reactor and in SFSP of both Units, as well as the Spent Fuel Storage Facilities are capable to withstand the design basis earthquake taking into account possible failures of supporting systems for the time period sufficient for repair works.

Flooding

In the worst case of increase of Lake Drūkšiai level, it does not culminate the level of the INPP safety related buildings and structures. The INPP design ensures the adequate protection against an external flooding. The flooding is impossible; the level margin is at least 1.4 m.

Extreme Weather Condition

The INPP design basis conditions correspond to the extreme weather conditions possible in the area of the INPP site.

Loss of Electrical Power and Loss of the Ultimate Heat Sink

The time needed for restoration of the INPP power supply after a possible total blackout of the Lithuanian energy system is approximately 30 minutes. Existing diesel generators are capable to provide backup power supply for remaining systems important to safety at the INPP for the needed time for more than 30 minutes.

Existing batteries are capable to provide diverse backup power supply for vitally important systems at the INPP for the needed time. Mobile diesel generators provide additional diversity of backup power supply.

Supply of fuel to ensure refuelling of diesel generators during operation over a long period of time is contracted.

The backup power supply to temperature and level instrumentation of spent fuel pools from a mobile diesel generator is designed and implemented.

Water feeding of the Unit 2 reactor and SFSP at both Units is carried out using the sufficient redundancy of feed sources.

As a good practice, the possibility to use the domestic potable water system should be noted. The domestic potable water system has independent pumps with own diesel generator.

Unloading of 350 fuel assemblies from the Unit 2 reactor and maintenance of the reactor in the shutdown state for a long period significantly reduced the risk of fuel damage in the reactor and pools in case of loss of cooling.

If the electrical power supply and ultimate heat sink is lost, the INPP staff has enough time and necessary means to prevent cliff edge effects.

Severe Accident Management

The Emergency Preparedness Organization (EPO) established by the license holder is capable to manage beyond design basis accidents. The EPO is staffed by highly qualified and trained personnel to cope with accidents in any or both Units or in the Spent Fuel Storage Facility. The EPO Accident Management Centre and Technical Support Centre are created and equipped with all required facilities for accident management and communication.

The INPP has developed the Emergency Preparedness Plan and Emergency Preparedness Operational Procedures, all needed instructions and manuals to control beyond design basis accidents. 10 special strategies to cope with the most probable accidents are developed and included into the instructions.

There are available all necessary systems, equipment, devices, tools and materials to support the accident management. Communication systems are redundant and diverse. Additional independent diesel generators provide emergency power supply.

The INPP has design and process documentation, prefabricated and marked pipe sections, facilities, tools to implement modifications for control of beyond design basis accidents.

The licensee's organization and arrangements to manage accidents are adequate. Measures to restrict the radioactive releases are adequate.

Potential Safety Improvements and Further Work Forecasted

The INPP prepared the plan of the stress tests safety improvement measures which were agreed on with the VATESI in May 2012. These safety improvement measures were included into the INPP Safety Improvement Programme for the year 2012 (SIP-3/2012) and 2013 (SIP-3/2013). The plan foreseen implementation of measures related to the issues listed in following clauses.

The plan for upgrading of nuclear safety in Lithuania (National Action Plan of Lithuania) for improvement of nuclear safety encompassing INPP stress tests safety improvement measures as well as regulatory measures was prepared be VATESI and reviewed in ENSREG National Action Plans Workshop which was held 22-26 April 2013 in Brussels, Belgium. This plan summarises the European stress test peer review results and other recommendations related with post-Fukushima lessons learned (see Table S.1.).

The English version of the National Action Plan of Lithuania can be found at ENSREG website (http://www.ensreg.org/EU-Stress-Tests/Country-Specific-Reports/EU-Member-States/Lithuania).

Lithuania fully shares the position that nuclear power plant accident in Japan has revealed the need to strengthen the international legal framework of nuclear safety. Lithuania is of the position that legally binding international nuclear safety standards should be adopted. This position was officially expressed in the Fifth Review Meeting of the Contracting Parties of the CNS in April 2011, IAEA High Level Meeting in June 2011, IAEA General Conference in 2011 and 2012, Meeting of the Contracting Parties of the Espoo Convention in June 2011, UN High-level Meeting on Nuclear Safety and Security (September 2011), EU Council meetings, Seoul Nuclear Security Summit (March 2012), etc.

Lithuanian position to strengthen CNS was also expressed in other IAEA, EU, UN high level events. Lithuania also supports and actively participates in the EU level talks and coordination of positions in regard to the CNS review process.

Convention on Nuclear Safety is a very important document in regard to nuclear safety, though this international instrument needs to be revised and adapted to new challenges raised by Fukushima accident. Nevertheless, current provisions laid down in the CNS should be fully implemented. Lithuanian position in regard to implementing the current provisions as well as the need for strengthening the CNS was clearly expressed during the Fifth Review Meeting of the Contracting Parties on 4-14 April 2011. Following recommendations set in the Convention on Early Notification of a Nuclear Accident, Lithuania has signed two bilateral agreements with neighbouring countries

(Latvia, Poland) and three bilateral agreements with Scandinavia countries: Denmark[1], Norway[2], Sweden[3]. Agreements with Latvia[4] and Poland[5] cover early notification and direct exchange of information between State Nuclear Power Safety Inspectorate (Lithuania) and Radiation Safety Centre (Latvia) and Radiation Emergency Centre CEZAR (Poland) in case of nuclear or radiological accidents. Agreements also cover the exchange of information on nuclear safety of nuclear facilities in operation as well as those being planned or under construction, their commissioning and decommissioning. Scientific and technical cooperation in the field of nuclear safety and radiation protection, including monitoring of radioactive releases, emergency planning and management of spent nuclear fuel and radioactive waste are also covered by agreements. The draft of bilateral agreement with Belarus is in the process of drafting.

S.1.2. Actions taken or planned to cope with natural hazards more severe than those considered in the design basis

See Section S.1.1.

S.1.3. For new nuclear power plants, improved safety features and additional improvements, if any, to address external hazards and to prevent accidents and, should an accident occur, to mitigate its effects and avoid off-site contamination

The VAE shall take into account lessons learned from Fukushima Daiichi accident during design stage of the VNPP.

S.1.4. Upgrading of accident management measures for extreme natural events, including for example measures to ensure core cooling and spent fuel pool cooling, the provision of alternate water sources for the reactor and for the spent fuel pool, the availability of the electrical power supply, measures to ensure containment integrity, and filtration strategies and hydrogen management for the containment

See Section S.1.1.

S.1.5. Measures taken or planned to ensure the effective independence of the regulatory body from undue influence, including, where appropriate, information on the hosting of IRRS missions

See Sections 8.2.1 and 8.2.3

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[1] Bilateral agreement between the Government of Lithuania and the Government of Kingdom of Denmark on early notification of nuclear accidents, exchange of information and cooperation in the field of nuclear safety and radiation protection. Copenhagen, 1993.03.16.

[2] Bilateral agreement between the Government of Lithuania and the Government of Kingdom of Norway on early notification of nuclear accidents and exchange of information on nuclear facilities. 1998.01.14.

[3] Bilateral agreement On early notification of Nuclear and Radiological Emergencies between the State Nuclear Power Safety Inspectorate of the Republic of Lithuania and the Swedish Radiation Safety Authority of the Kingdom of Sweden. Stockholm, Vilnius, 2008.12.31.

[4] Bilateral agreement between the Government of Lithuania and the Government of Latvia on early notification of nuclear accidents, exchange of information and cooperation in the field of nuclear safety and radiation protection. Vilnius, 3 of October, 2003.

[5] Bilateral agreement between the Government of Lithuania and the Government of Poland on early notification in case of nuclear accident and cooperation in nuclear safety and radiation safety fields. Warsaw, 1995.06.02.

S.1.6 Enhancements of emergency preparedness and response measures, including for example for multi-unit sites, approaches and methods of source term estimation and initiatives in the field of remediation

See Sections 6.3., 16.1.3.2. and 19.4.3.

S.1.7. Information on how IAEA safety standards are taken into account

The BSR-1.1.1-2011 "Rules of Procedure for Drafting of Nuclear Safety Requirements and Nuclear Safety Rules" sets requirement that all requirements prepared by the VATESI shall take into account the IAEA safety standards. Licence holders also shall follow the IAEA safety standards. During inspections performed by the VATESI conformity with IAEA safety standards should be checked.

S.1.8. Information on activities undertaken to enhance openness and transparency for all stakeholders

See Sections 8.1.10. and 9.4.

S.1.9. Safety culture and human and organizational factors which affect the consideration of external events, design, severe accident management, including operator training, the good functioning of national organizations and emergency preparedness and response

See Sections 10.1.2., 10.2 and S.1.1 and Articles 11 and 12

S.2 Implementation of IAEA Action Plan on Nuclear Safety

Lithuania fully supports the IAEA efforts to strengthen nuclear safety declared in the IAEA Action Plan on Nuclear Safety. Lithuania supports and actively participates in the process of implementation of this Action Plan as well as by submitting direct proposals to the IAEA. In this regard, official proposals for the Action Plan were submitted to the IAEA in August 2011 (strengthen IAEA safety standards and IAEA role in nuclear safety area; in case of dispute conduct IAEA specialized missions before the final decision on NPP site is made; need to strengthen national nuclear regulatory authorities; enhance publicity about IAEA missions etc.).

VATESI experts 2012-2013 have been participating in several meetings, organized in connection with the implementation of the IAEA Action Plan on Nuclear Safety:

- International Experts' Meeting on Reactor and Spent Fuel Safety in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant, 19-22 March, 2012;
- International Experts' Meeting on Human and Organizational Factors in Nuclear Safety in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant, 21-24 May, 2013.

Additional to that see Section S.1.

Table S.1. Summary of activities of the National Action Plan as of date 6 August 2013.

No.	Topic	Activity	Basis	Finalization	Status	Responsibility
1.	General	To consider the necessity of revision of the regulations applied to NPPs robustness against natural hazards (earthquake, flooding and extreme weather conditions), including revaluation of margins beyond the design basis and cliff-edge effects in compliance with planed WENRA guidance when it will be issued.	ENSREG Peer Review Report Planned WENRA guidance	1 year after issuing of WENRA guidance	Planned	VATESI
2.	General	Taking into account planned WENRA guidance (see topic above in this table) review and update, if necessary, of existing nuclear safety regulations applied to Visaginas NPP, as well as ones which are in preparation in the field of: –natural hazards assessment, including evaluation of margins beyond design basis and cliff-edge effects; –design and beyond design basis issues, including provisions for power supply robustness, measures to protect containment integrity, instrumentation and control equipment robustness , including spent fuel pools issues; –severe accident management, including provisions for organization and arrangements to manage severe accidents, hydrogen management issue, severe accident phenomena issues, and measures to restrict the radioactive releases; –emergency preparedness and response, including consideration of multi-unit events including long term effects, consideration of natural	ENSREG Peer Review Report, CNS, Planned WENRA guidance	2015	Planned	VATESI

No.	Topic	Activity	Basis	Finalization	Status	Responsibility
		disasters leading to loss of infrastructure, concepts to manage large volumes of contaminated water, revaluation of communication and announcement capabilities. All other requirements dedicated to Visaginas NPP that encompass other fields should be checked in the light of post-Fukushima lessons learned and proposal of update if necessary.				
3.	General	Activities raised from EPREV review mission conducted in Lithuania regarding the preparedness for responding to a nuclear or radiological emergency should be addressed and included in the Plan if necessary.	EPREV review mission report	2013	Planned*	State institutions involved in EPREV mission
4.	Natural hazards	To evaluate the spent fuel cask tip over in case of earthquake during transportation and to assess radiological impact on the environment, personnel and population.	National final report on “stress tests”	2013	In progress	Ignalina NPP
5.	Natural hazards	To consider the necessity of improvement of emergency preparedness procedures or updating those after confirmation of the calculation results of the spent fuel cask tip over during transportation.	National final report on “stress tests”	2014	In progress	Ignalina NPP
6.	Natural hazards	To assess the robustness and availability of accident management centre of organization of emergency preparedness against an earthquake. If needed, to develop measures to improve the robustness of accident management centre.	National final report on “stress tests”	2013	In progress	Ignalina NPP

No.	Topic	Activity	Basis	Finalization	Status	Responsibility
7.	Natural hazards	To consider the possibility of the seismic alarm and monitoring system application for formalization of the emergency preparedness announcement criterion and to include this criterion in the operational manual of the seismic warning and monitoring system.	National final report on “stress tests”	2012	Implemented	Ignalina NPP
8.	Natural hazards	To provide data transfer of the seismic alarm and monitoring system to the computer information system of organization of emergency preparedness, i.e. to the accident management centre, technical support organization and radiation safety monitoring control room and to update corresponding procedures of organization of emergency preparedness.	National final report on “stress tests”	2012 – 2013	Implemented	Ignalina NPP
9.	Natural hazards	To assess the possibilities of the emergency removal and repair works by organization of emergency preparedness for beyond design-basis emergency scenarios related to the level of earthquake above maximal calculated earthquake and resulting in the cracks or collapse of the construction structures of the operating spent fuel interim storage facility and new spent fuel interim storage facility, including casks blockage by debris, as well as cracks or collapse of the construction structures of the “hot cell” of the new spent fuel interim storage facility during the works with spent nuclear fuel in the “hot cell”.	National final report on “stress tests”	2012 – 2013	Implemented	Ignalina NPP
10.	Design issues	To provide the power supply of water temperature and level instruments in the storage pools of both units from diesel generator No. 7 of unit 2 or from the mobile diesel generator connected to Unit 2.	National final report on “stress tests”	2011	Implemented	Ignalina NPP
11.	Design issues	To provide the diesel fuel supply for assuring long-term operation of diesel generators. The contract on the supply of diesel fuel was made with fuel company in January 2012.	National final report on “stress tests”	2012	Implemented	Ignalina NPP

No.	Topic	Activity	Basis	Finalization	Status	Responsibility
12.	Design issues	To evaluate the capacity for work of water temperature and level instrumentation in the spent fuel storage pools as well as radiation detectors in the spent fuel storage pools halls of both units in conditions of beyond design-basis accident. If needed, to develop the appropriate improvement measures.	National final report on “stress tests”	2012 – 2013	Implemented	Ignalina NPP
13.	Design issues	The special sub-module of the plant computer information system will be developed to provide information about the water temperature and level measurements in spent fuel storage pools as well as radiation level in the spent fuel storage pools halls from both units during and after beyond design-basis accident. The data of water temperature and level measurements in the spent fuel storage pools as well as radiation level measurements in the spent fuel storage pools halls will be transferred to the computer information system of main control room, accident management centre of organization of emergency preparednness and VATESI. This activity is planned by Licensee in accordance with modification schedule, to be completed not later 2014.	National final report on “stress tests”	2014	In progress	Ignalina NPP
14.	General	To examine existing documents concerning the spent fuel storage pools safety. To review management procedures and manuals of beyond design-basis accidents in the spent fuel storage pools. To evaluate planned and implemented modifications related with the spent fuel storage pools safety. To determine additional measures if needed.	ENSREG Country Peer Review Report	2012 – 2013	Implemented	Ignalina NPP

* The activities raised from EPREV mission will be included in the Plan after confirming of the measures of improvements among all Lithuanian institutions involved in this review.

ANNEXES

ANNEX I. Annex to Article 7(1)

The most significant legislation on Nuclear Energy:

I. The Laws of the Republic of Lithuania

- Law on Nuclear Energy (Official Gazette, 1996, No. 119-2771; 2011, Nr. 91-4314);
- Law on Nuclear Safety (Official Gazette, 2011, Nr. 91-4316);
- Law on the Management of Radioactive Waste (Official Gazette, 1999, No. 50-1600; 2011, No. 91-4318);
- Law on Radiation Protection (Official Gazette, 1999, No. 11-239);
- Law on Environmental Protection (Official Gazette, 1992, No. 5-75);
- Law on Environmental Monitoring (Official Gazette, 1997, No. 112-2824);
- Law on Waste Management (Official Gazette, 1998, No. 61-1726; 2002, No. 72-3016);
- Law on Civil Protection (Official Gazette, 1998, No. 115-3230; 2009, No. 159-7207);
- Law on Energy (Official Gazette, 2002, No. 56-2224; 2011, No. 160-7576);
- Law on Electricity (Official Gazette, 2000, No. 66-1984; 2012, Nr. 17-752);
- Law of Metrology (Official Gazette, 1996, No. 74-1768; 2006, No. 77-2966);
- Law on Environmental Impact Assessment of the Proposed Economic Activity (Official Gazette, 1996, No. 82-1965; 2005, Nr. 84-3105);
- Law on Charges (Official Gazette, 2000, No. 52-1484);
- Law on Construction (Official Gazette, 1996, No. 32-788; 2001, No. 101-3597);
- Law on Control of Strategic Goods (Official Gazette, 1995, No. 61-153; 2004, No. 73-2532; 2011, No. 128-6052);
- Law on Health System (Official Gazette, 1994, No. 63-1231; 1998, No. 112-3099);
- Law on Decommissioning of Unit 1 of the State Enterprise Ignalina Nuclear Power Plant (Official Gazette, 2000, No. 42-1189);
- Law on Nuclear Power Plant (Official Gazette, 2007, No. 76-3004; 2012, No. 73-3779);
- Law on the State Enterprise Ignalina Nuclear Power Plant Decommissioning Fund (Official Gazette, 2001, No. 64-2331);
- Law on Water (Official Gazette, 1997, No. 104-2615);
- Law on Depths of Land (Official Gazette, 1995, No. 63-1582);
- Law on Safety and Health of Employees (Official Gazette, 2003, No. 70-3170);
- Law on Fire Safety (Official Gazette, 2002, No. 123-5518);
- Law on Additional Employment and Social Guarantees for the Employees of the State Enterprise Ignalina Nuclear Power Plant (Official Gazette, 2003, No. 48-2106);
- The Law on Granting the concession and assuming the essential property obligations of the Republic of Lithuania in Visaginas NPP Project (Official Gazette,2012, No. 73-3780);
- Law on the Enforcement of Application of the Vienna Convention on Civil Liability for Nuclear Damage of May 21, 1963 and the Joint Protocol

Relating to the Application of the Vienna Convention and the Paris Convention of 21 September 1988 (Official Gazette, 1993, No. 63-1201);

- Law on Corporate Income Tax (Official Gazette, 2001, No. 110-3992);
- Law on State and Official Secrets (Official Gazette, 1999, No. 105-3019; Official Gazette, 2012, No. 129-6469).

II. Multilateral international treaties and conventions and treaties with international organizations

- Convention on Nuclear Safety, entered into force on 24th of October, 1996;
- Joint Convention On the safety of spent fuel management and on the safety of radioactive waste management, entered into force on 14th of June, 2004;
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency 1986, entered into force on 22nd of October, 2000;
- Convention on environmental impact assessment in a transboundary context (ESPOO), 1991, entered into force on 11th of April, 2001;
- Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 1992, entered into force on 27th of July, 2000;
- International Convention for the Suppression of Acts of Nuclear Terrorism, 2005, entered into force on 19th of August, 2007;
- Treaty on the Non-Proliferation of Nuclear Weapons (NPT), 1968, entered into force on 23rd of September, 1991;
- The Comprehensive Nuclear Test Ban Treaty, 1996;
- European agreement concerning the international carriage of dangerous goods by road (ADR) 2003, entered into force on 1st of January, 2003;
- Memorandum of Understanding (Version Ronne, 25 to 27 August 1998) for the Transport of Dangerous Goods in ro-ro Ships in Accordance with the International Maritime Dangerous Goods Code (IMDG Code), the Requirements of the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) and the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), 1998, entered into force on 20th of June, 2002;
- Vienna Convention on Civil Liability for Nuclear Damage, 1963, entered into force on 15th of November, 1992;
- Convention on Physical Protection of Nuclear Material, 1979, entered into force on 6th of January, 1994;
- 2005 July 8th Amendment to the Convention on the Physical Protection of Nuclear Material;
- Convention on Early Notification of a Nuclear Accident, 1986, entered into force on 17th of December, 1994;
- Convention on access to information, public participation in decision-making and access to justice in environmental matters, 1998, entered into force on 28th of April, 2002;
- Joint Protocol Relating to the Application of the Vienna Convention ant the Paris Convention, 1988, entered into force on 20th of December, 1993.

Signed, not ratified:

- Convention on Supplementary Compensation for Nuclear Damage, 1997;
- Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage, 1997.

Cooperation agreements with IAEA in area of NP:

- Membership in IAEA – 18th November 1993;

- NPT related agreement, INFCIRC/413, entered into force 15th October, 1992;
- Additional Protocol, entered into force 5th July 2000;
- Improved procedures for designation of safeguards inspectors (accepted);
- Agreement between the Kingdom of Belgium, the Kingdom of Denmark, the Federal Republic of Germany, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the European Atomic Energy Community and the International Atomic Energy Agency in implementation of Article III (1) and (4) of the Treaty on the non-proliferation of nuclear weapons (78/164/EURATOM) 1978, entered into force 21st of April, 2007;
- Additional Protocol to the Agreement between the Republic of Austria, the Kingdom of Belgium, the Kingdom of Denmark, the Republic of Finland, the Federal Republic of Germany, the Hellenic Republic, Ireland, the Italian Republic, the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the Portuguese Republic, the Kingdom of Spain, the Kingdom of Sweden, the European Atomic Energy Community and the International Atomic Energy Agency in implementation of Article III(1) and (4) of the Treaty on the Non-proliferation of Nuclear weapons (notified under document number COM(1998) 314) (78/164/EURATOM), 1998, entered in force 1st of January, 2008;
- Supplementary agreement on provision of technical assistance by the IAEA, entered into force 22nd February1995;
- Agreement on the Privileges and Immunities of the IAEA, 1959, entered into force 28th of February, 2001.

III. Bilateral Agreements

- Agreement for the Exchange of information and co-operation of nuclear and Radiological safety area between the Government of the Republic of Lithuania and Kingdom of Denmark, came into force on March 16th, 1993 (Official Gazette, 1995, No. 37-919);
- Agreement on early notification of nuclear and Radiological Emergencies between the Government of the Republic of Lithuania and Government of the Republic of Poland, came into force on December 18th, 1996 (Official Gazette, 1997, No. 55-1262);
- Agreement on early notification of nuclear accidents and on the exchange of information on nuclear facilities between the Government of the Republic of Lithuania and the Government of the Kingdom of Norway, came into force on January 14th, 1998 (Official Gazette, 1997, No. 109-2760);
- Target Agreement between the German and Lithuanian party on Methodology transfer for the preparation of NPP decommissioning for leading personnel of the Ignalina NPP and for representatives of Lithuanian authorities, came into force on February 21st, 2002;
- Agreement on early notification of nuclear and Radiological Emergencies between the Government of the Republic of Lithuania and Government of the Republic of Latvia, came into force on October 3rd, 2003 (Official Gazette, 2004, No. 30-972);
- Accession agreement to the ESARDA Agreement No. 22613-2004-12 SONEN ISP BE, signed on October 17th, 2005;
- Agreement on early notification of nuclear and Radiological Emergencies between the State nuclear power safety inspectorate of the Republic of Lithuania and the Swedish Radiation Safety Authority of the Kingdom of Sweden, signed on December 28th, 2008;
- Arrangement between the Lithuanian State nuclear power safety inspectorate (VATESI) and the United states nuclear regulatory commission (NRC) for the Exchange of technical information, signed on September 23rd, 2010;
- Arrangement between State Nuclear Regulatory Committee of Ukraine and State Nuclear Power Safety Inspectorate of Republic of Lithuania for the Exchange of information and cooperation in the matters of regulation of usage nuclear energy for peaceful purposes, signed on December 3rd, 2010.

ANNEX II. Annex to Article 7(3)

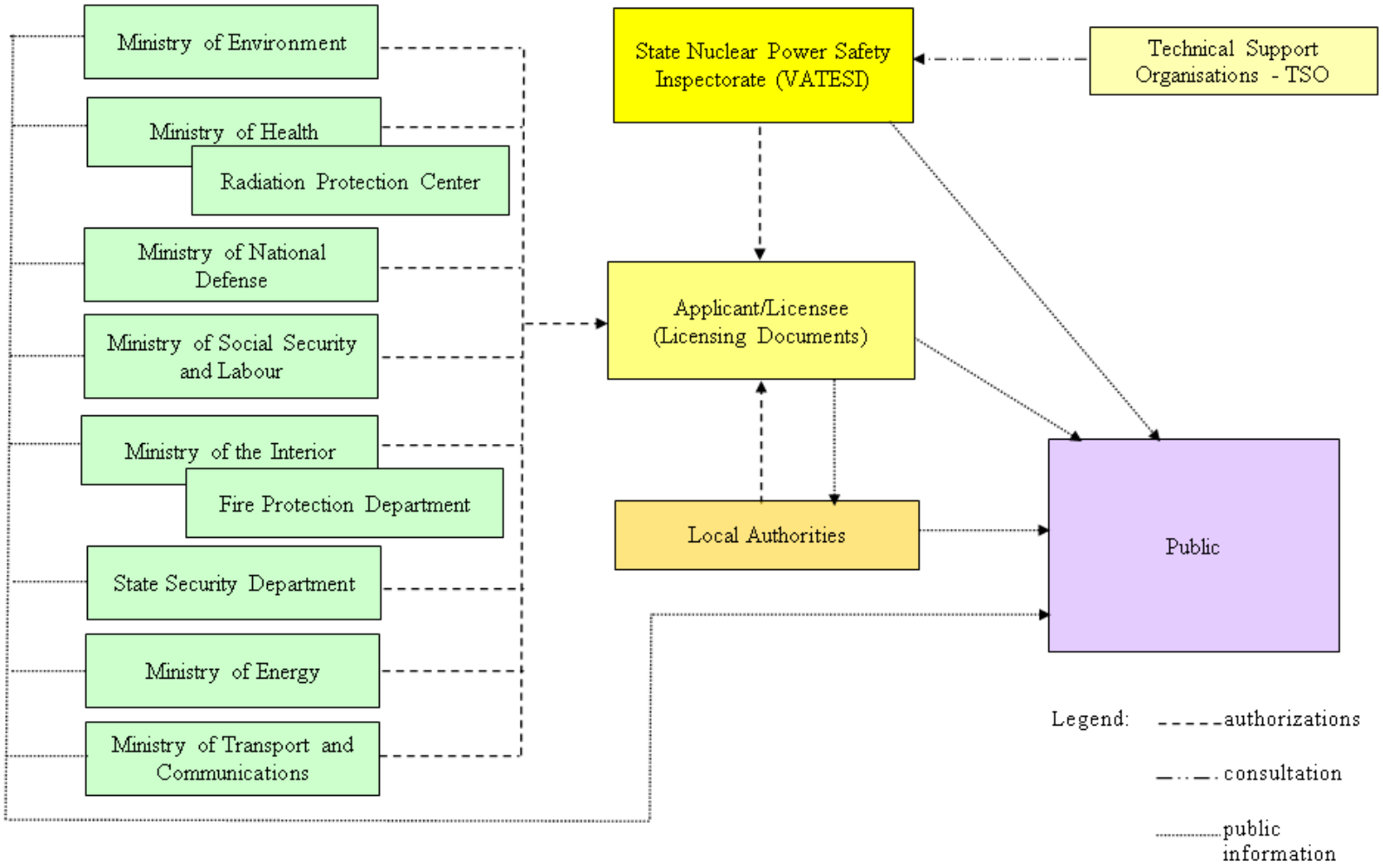

Figure A.1 Involvement of the public and interested parties within Lithuania.

ANNEX III. Annex to Article 8.1.4

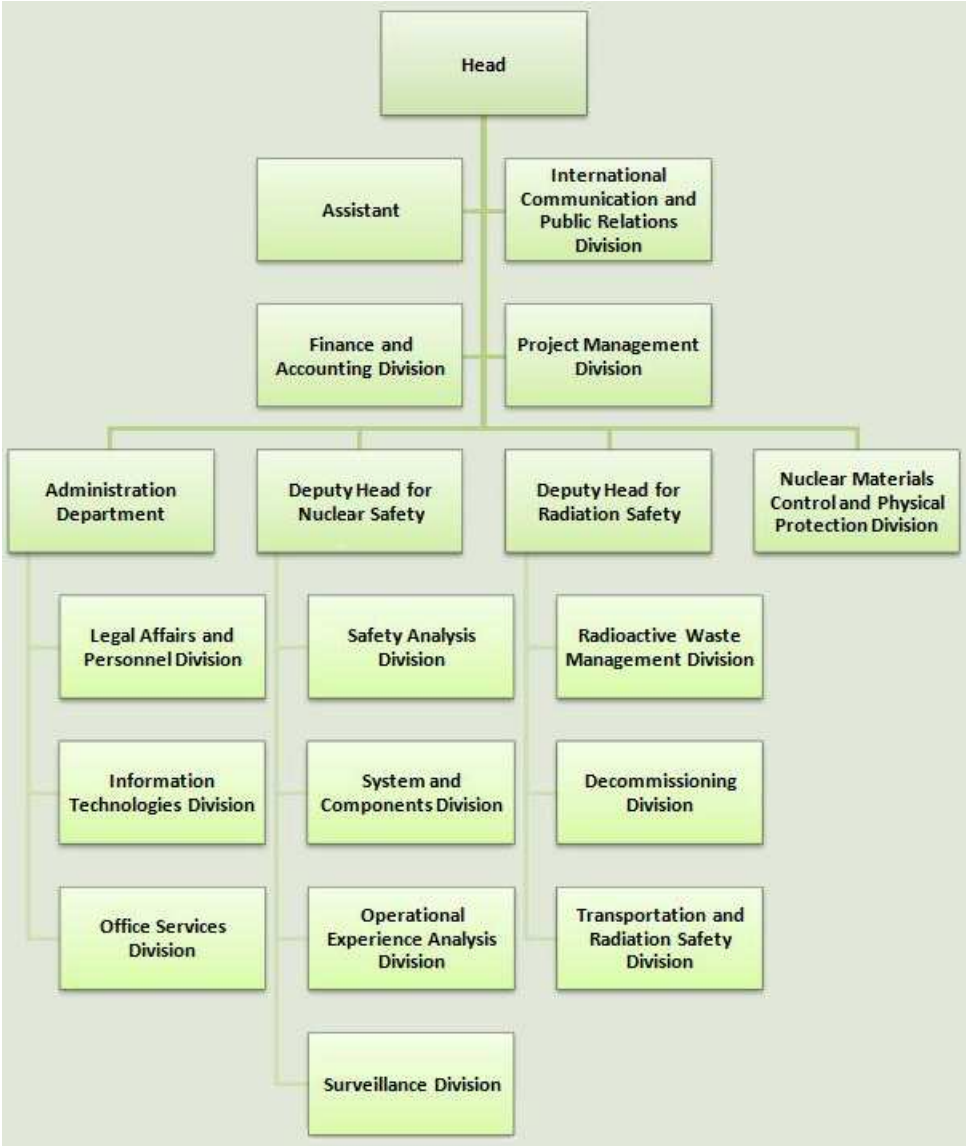

Figure A.2 Current VATESI administrative structure.

ANNEX IV. Annex to Article 8.2.1

COMPETENCE OF NATIONAL AUTHORITIES IN NUCLEAR ENERGY SECTOR

The competence of the main national authorities in nuclear energy sector is described in the Articles 6–17 of the Law on Nuclear Energy.

"Article 6. Competence of the Parliament of the Republic of Lithuania

The Parliament of the Republic of Lithuania (the **Seimas**) shall:

1) decide on strategic issues of nuclear energy development in the Republic of Lithuania;

2) adopt laws on construction of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor, also on decommissioning of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor.

Article 7. Competence of the Government of the Republic of Lithuania

1. The Government of the Republic of Lithuania (the **Government**) shall:

1) shape strategic directions of the state policy in the area of nuclear energy;

2) on assessment of the economic and public needs for construction of a nuclear installation, draft and submit to the Seimas a law on construction of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor, also on decommissioning of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor;

3) in the manner prescribed by the laws of the Republic of Lithuania adopt a resolution on the start of construction of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor, also shall adopt a resolution on construction of other nuclear installations;

4) approve the rules for issuance of licences and permits for activities in the sphere of nuclear energy or shall assign approving of such rules to the authorised institution;

5) on recommendation of the Ministry of Interior of the Republic of Lithuania approve the state plan for protection of population in case of a nuclear accident;

6) evaluate and decide concerning approval of the report on activities of the State Nuclear Power Safety Inspectorate;

7) perform other functions set forth by this Law, other laws and legal acts.

2. The Government prior to adopting a resolution on the start of construction of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor shall take into account:

1) fulfillment of the requirements set forth in the law on construction of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor;

2) compliance of the persons participating in the projects of a new nuclear power plant or an individual nuclear power plant energy unit or a research nuclear reactor with the interests of national security and implementation of special security measures ensuring national security interests in the manner and subject to the provisions of the Law on Enterprises and Facilities of Strategic Importance to National Security and Other Enterprises of Importance to Ensuring National Security and/or other laws of the Republic of Lithuania;

3) main characteristics of the use of natural resources for the needs of construction and operation of a nuclear installation and the resulting environmental impact;

4) nuclear safety guarantees provided for by the laws.

3. The Government prior to adopting a resolution on the start of construction of other nuclear installation shall take into account the requirements stipulated in sub-paragraphs 3 and 4 of paragraph 2 of this Article, as well as the economic and public needs for construction of such nuclear installation.

Article 8. Competence of the Emergency Commission of the Government

The Emergency Commission of the Government shall:

1) adopt decisions required for managing of an imminent or ongoing nuclear or radiological accident;

2) submit to the Government proposals on the use of civil protection supplies of the State reserve in the event of nuclear or radiological accidents;

3) carry out other functions laid down in the Law on Civil Protection of the Republic of Lithuania (the **Law on Civil Protection**) also prescribed by the Government and pertaining to implementation of the tasks of the civil protection system set by the Government.

Article 9. Competence of the Ministry of Energy of the Republic of Lithuania

The Ministry of Energy of the Republic of Lithuania (the **Ministry of Energy**) shall:

1) shape the State policy in the area of nuclear energy and organise, coordinate and control implementation thereof;

2) exercise rights and obligations of a member of the body of operator of nuclear installations provided the Republic of Lithuania is a member of the body of such operator;

3) organise bilateral and multilateral international cooperation in the sector of nuclear energy;

4) within its competence represent the Republic of Lithuania in international organisations and conferences on nuclear energy;

5) upon approval of the detailed plan of the territory for construction of a nuclear installation, in the manner set out by the legal acts shall initiate taking of a land plot for construction of a nuclear installation for public needs;

6) organise the development of the infrastructure of the nuclear energy in the Republic of Lithuania;

7) carry out other functions laid down in this Law, other laws and legal acts.

Article 10. Competence of the Ministry of Health of the Republic of Lithuania or Its Authorised Institutions

The Ministry of Health of the Republic of Lithuania (the **Ministry of Health**) or its authorised institution shall:

1) establish the requirements for medical examination of persons working at nuclear installations and shall supervise and control compliance therewith;

2) within its competence and in the manner set out by the Law on Environmental Impact Assessment of the Proposed Economic Activity of the Republic of Lithuania (the **Law on Environmental Impact Assessment of the Proposed Economic Activity**) shall participate in the process of the environmental impact assessment of nuclear installations and in appraisal of a possible impact of nuclear installations on the public health;

3) carry out other functions laid down in this Law, other laws and legal acts.

Article 11. Competence of the Ministry of Environment of the Republic of Lithuania or Its Authorised Institutions

The Ministry of Environment of the Republic of Lithuania (the **Ministry of Environment**) or its authorised institution shall:

1) in the manner set out by the legal acts conduct the state construction supervision of the building structures of nuclear installations;

2) prepare and approve methodology of assessment of damage caused by ionising radiation to the environment and its compensation;

3) periodically inform the general public and the state and municipal authorities on the radiation situation in the country;

4) carry out other functions laid down in this Law, other laws and legal acts.

Article 12. Competence of the Ministry of Social Security and Labour of the Republic of Lithuania or Its Authorised Institutions

1. The Ministry of Social Security and Labour of the Republic of Lithuania (the **Ministry of Social Security and Labour**) shall coordinate supervision of potentially dangerous equipment conducted by the institutions authorised to inspect technical condition of the equipment in the manner set out by the Law on Supervision of Potentially Dangerous Equipment of the Republic of Lithuania.

2. The State Labour Inspectorate of the Republic of Lithuania shall control compliance with the requirements of employment, employment safety and related legal acts.

Article 13. Competence of the Ministry of Education and Science of the Republic of Lithuania

The Ministry of Education and Science of the Republic of Lithuania (the **Ministry of Education and Science**) shall organise development and introduction of education and science programmes as well as curricula and other measures to train nuclear energy specialists, including the specialists with functions pertaining to safety of a nuclear installation, *inter alia*, with the aim of maintaining and increasing the competence and knowledge in the field of nuclear safety.

Article 14. Competence of the Ministry of National Defence of the Republic of Lithuania

The Ministry of National Defence of the Republic of Lithuania (the **Ministry of National Defence**) shall:

1) participate in drafting and implementing co-ordinated interdepartmental anti-terrorist and anti-intervention protection plans of the nuclear power plant and other nuclear installations;

2) in the manner set out by the legal acts participate in ensuring physical security of nuclear installations;

3) in the manner set out by the legal acts assist in eliminating consequences of nuclear and/or radiological accidents;

4) carry out other functions laid down in this Law, other laws and legal acts.

Article 15. Competence of the Ministry of the Interior of the Republic of Lithuania or Its Authorised Institutions

The Ministry of Interior of the Republic of Lithuania (the **Ministry of Interior**) or its authorised institutions shall:

1) ensure fire safety of nuclear installations, extinguish fires, rescue people and property, mitigate consequences of fires and shall direct such activities;

2) conduct the state fire safety supervision of nuclear installations;

3) coordinate fire safety requirements for the constructions, systems and components important for safety of nuclear installations drafted by the State Nuclear Power Safety Inspectorate;

4) coordinate fire safety training programmes for persons working at nuclear installations and shall participate in testing the knowledge of managing personnel of such installations;

5) exercise and ensure physical security of the nuclear power plant, other nuclear installations sited in the border area of the Republic of Lithuania and shipment of cargoes containing nuclear materials, the quantity of which exceeds the quantity established in Annex 1 to the Law on Nuclear Safety, across the territory of the Republic of Lithuania in accordance with the requirements set by the Head of the State Nuclear Power Safety Inspectorate;

6) exercise functions of the response forces for protection of nuclear installations and shipment of nuclear material cargoes across the territory of the Republic of Lithuania, including acceptance of a request for emergency assistance, assessment of a request for emergency assistance, determination of the need for emergency assistance, sending emergency assistance to the place of emergency, ensuring emergency assistance at the place of emergency and coordination of emergency assistance actions;

7) draft, coordinate and implement co-ordinated interdepartmental anti-terrorist and anti-intervention protection plans for the nuclear power plant and other nuclear installations;

8) analyse and control the crime situation in the regions with nuclear installations;

9) investigate the cases of theft and illegal possession of nuclear and radioactive materials, also of other dual-use nuclear goods;

10) based on the analysis and assessment of nuclear and radiological accident risk provided by an operator of a nuclear installation, prepare, update (if needed) and submit for approval of the Government the state plan for protection of the population in the event of a nuclear accident on the grounds of which the executive municipal institution in the municipal plans for control of emergency situations will envisage measures and actions for protection of population in the event of nuclear and/or radiological accidents, and the executive institutions of municipalities of Ignalina District, Zarasai District and Visaginas shall prepare and approve detailed plans for population evacuation;

11) within its competence implement measures of response to a nuclear and radiological accident and mitigation of their consequences, shall organise and conduct radiation survey of a contaminated area on the land and from the air;

12) jointly with other state institutions organise training sessions of population protection in the event of nuclear and radiological accidents;

13) carry out other functions laid down in this Law, other laws and legal acts.

Article 16. Competence of the State Security Department of the Republic of Lithuania

1. The State Security Department of the Republic of Lithuania (the **State Security Department**):

1) in order to secure the State security interests, in the manner laid down by the laws and other legal acts as well as within its competence, shall collect, analyse and provide information on threats to the nuclear installations;

2) in the manner and on the grounds laid down by the laws and other legal acts shall screen and provide conclusions about the persons who are being admitted to work or who are working at the nuclear installations or about the persons who are being admitted to work or who are working at other institutions and companies who due to the functions and tasks assigned to them have to gain the right to enter protection areas of nuclear installations unaccompanied, with the exception of limited access areas, also about the persons who have to be present in transporting of nuclear fuel cycle materials;

3) shall participate in drafting and implementing co-ordinated interdepartmental anti-terrorist and anti-intervention protection plans of the nuclear power plant and other nuclear installations;

4) shall coordinate the list of official positions at the State Nuclear Power Safety Inspectorate, the persons employed (transferred) to which are subject to screening by the State Security Department in order to receive the conclusion referred to in paragraph 2 of Article 24 of this Law;

5) shall carry out other functions laid down in this Law, other laws and legal acts.

2. The procedure for screening of the persons referred to in sub-paragraph 2 of paragraph 1 of this Article shall be established by the director general of the State Security Department.

Article 17. Competence of Municipal Institutions

The municipal institutions within their competence:

1) in the manner laid down by the laws and other legal acts of the Republic of Lithuania shall receive information on operation or decommissioning of nuclear installations located in the territory of the municipality and shall submit proposals to the authorised state institutions concerning construction, operation, supervision and control of such nuclear installations;

2) based on the Government-approved state plan for protection of population in the event of a nuclear accident, shall explicate the substantiation of preparedness for nuclear and/or radiological accidents as well as the envisaged preventive measures in the plan for control of emergency situations of the municipality;

3) in the event of a nuclear and radiological accident shall inform the population about the radiation situation in the sites of nuclear installations and about the undertaken measures for civil protection;

4) shall carry out other functions laid down in this Law, other laws and legal acts."

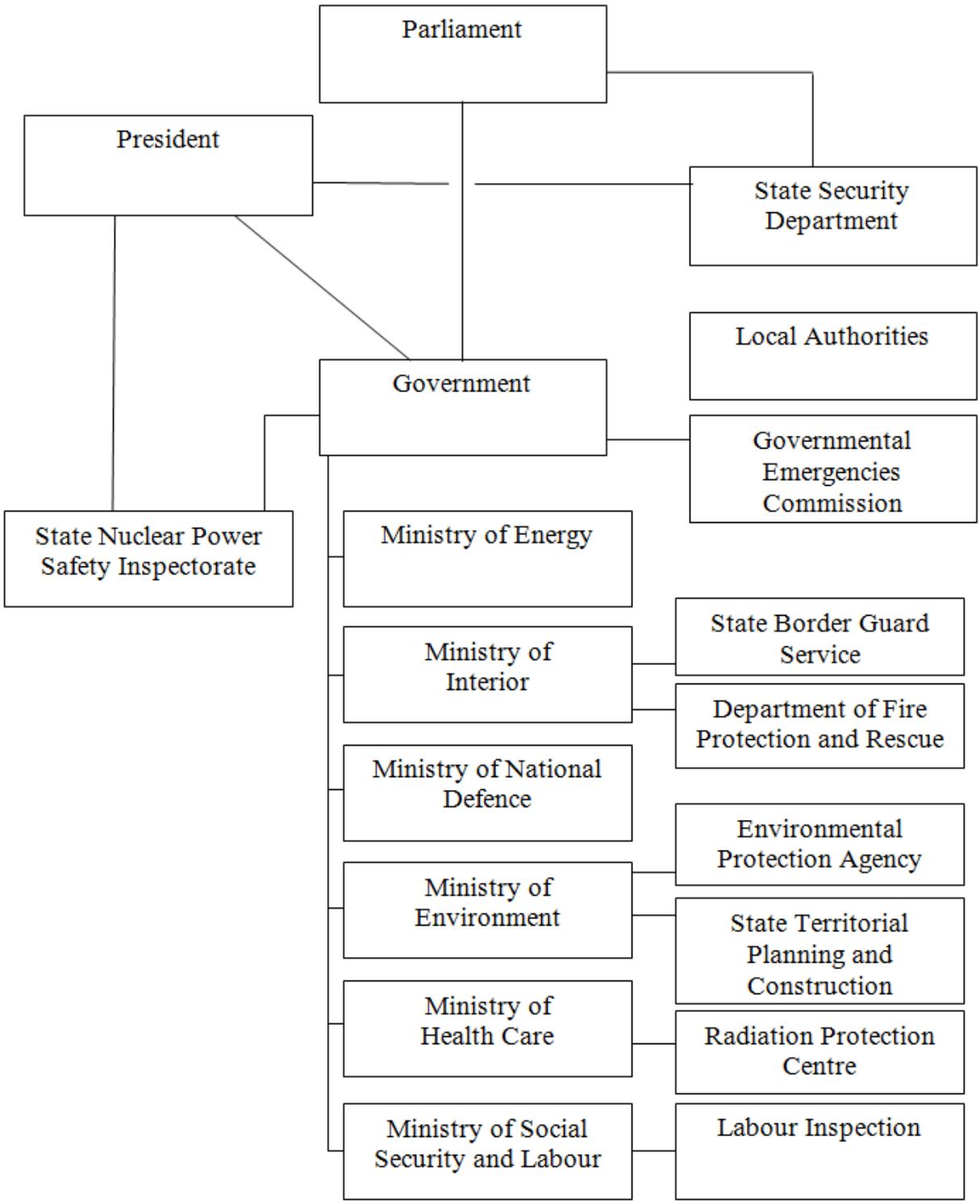

Figure A.3 VATESI position in Governmental structure.

ANNEX V. Annex to Article 13.3

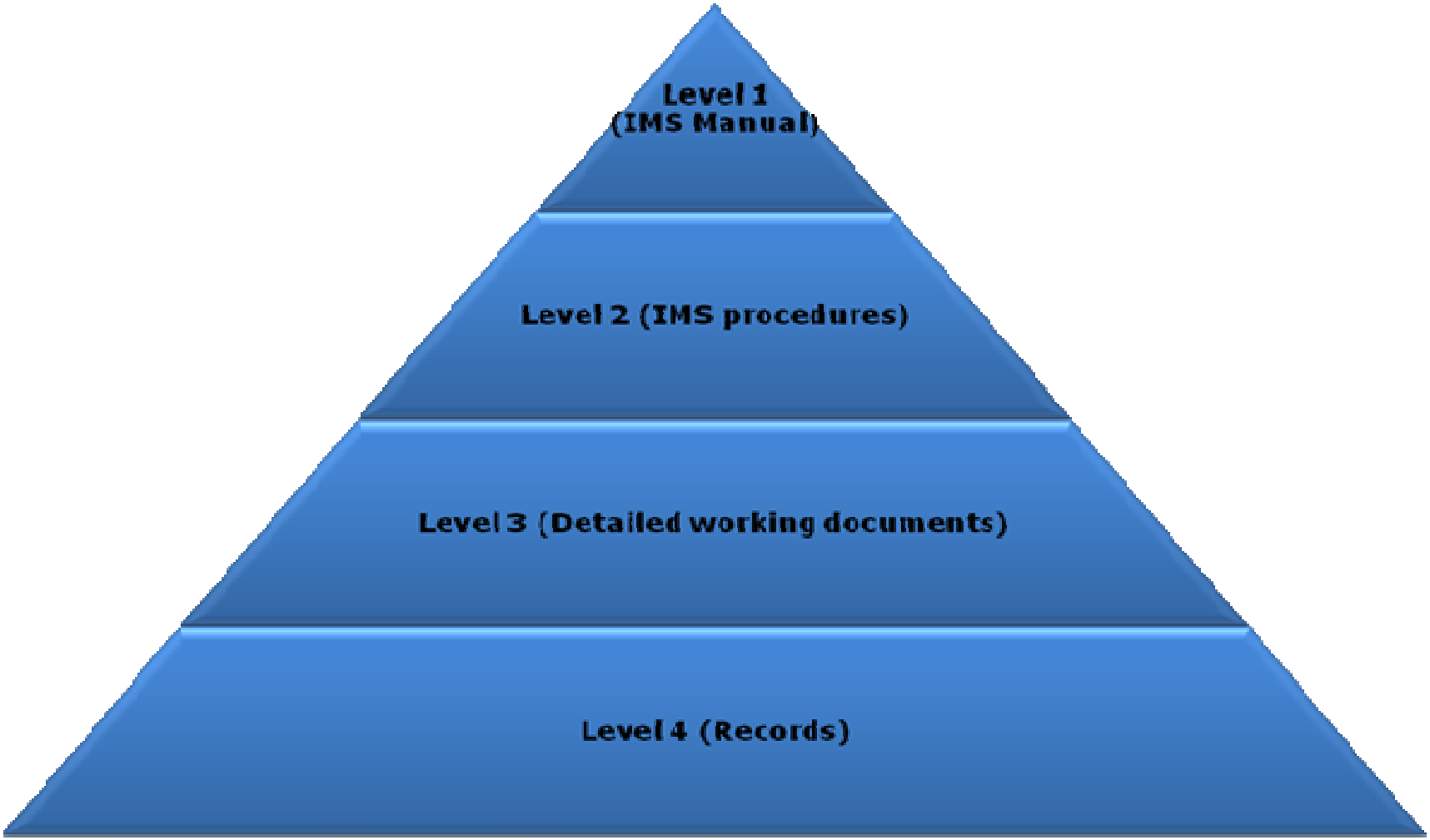

Figure A.4 IMS documentation structure of INPP.

List of the INPP IMS organizational processes:

- Plant administration;
- Planning;
- Licensing;
- Safety culture;
- Self-assessment;
- Independent assessment;
- Improvements;
- Documents and records;
- Operating experience;
- Internal and external communications;
- Environmental protection;
- Radiation safety;
- Fire safety;
- Industrial safety;
- Emergency preparedness;
- Post-operation technological processes;
- Energy resources;
- Information technologies;
- Maintenance;
- Ageing management;
- Inspections and testing;
- Nuclear fuel management;
- Nuclear safety;
- Radioactive waste management and house-keeping;
- Human resources;
- Chemistry;
- Plant modifications;
- Procurement;
- Sales;
- Design;
- In-house fabrication of spare parts and items;
- Storage of materials and equipment;
- Physical protection;
- Decommissioning projects;
- Preparations for dismantling;
- Engineering inventory;
- Radiological characterization;
- Isolation;
- Financial resources;
- Dismantling;
- Construction and demolition;
- Decontamination.

ANNEX VI. Annex to Article 15.1

Laws, norms and standards which regulates the protection of general public, workers of nuclear facilities and environment from the possible radiation impact:

- Law on Radiation Protection (No. VIII-1019, 1999, last amended 2011);
- Law on Nuclear Safety (No. XI-1539, 2011);
- Law on Nuclear Energy (No. I-1613, 1996, last amended 2011);
- Law on the Management of Radioactive Waste (No. VIII-1190, 1999, last amended 2011);
- Law on Environmental Protection (No. I-2223, 1992, last amended 2011);
- Law on Environmental Monitoring (No. VIII-529, last amended 2006);
- Law on the Workers Safety and Health of the Republic of Lithuania (No IX-1672, 2003, last amended 2004);
- Governmental Resolution No. 461 On the Regulation on Providing of Data Concerning Activities Related with the Disposal of Radioactive Waste to the Commission of the European Communities (2007);
- Order of the Minister of Health and the Head of the State Nuclear Power Safety Inspectorate No. V-1271/22.3-139 On the Rules of Radioactive Substances, Radioactive Waste and Spent Nuclear Fuel Import, Export, Transportation in Transit and inside the Republic of Lithuania (2008);
- Order of the Minister of Health No. V-904 On Approval of the Rules of Safety of the Sources of Ionizing Radiation (2012);
- Order of the Head of State Nuclear Power Safety Inspectorate No. 22.3-39 On Requirements on Nuclear Power Facilities Decommissioning (2009);
- Order of the Head of State Nuclear Power Safety Inspectorate No. 22.3-95 On the Approval of Nuclear Safety Requirements BSR 1.9.3-2011 "Radiation Protection at Nuclear Facilities";
- Order of the Head of State Nuclear Power Safety Inspectorate No. 22.3-89 On the Approval of Nuclear Safety Requirements BSR-1.9.1-2011 "Limits of Radioactive Discharges into Environment from Nuclear Facilities and Requirements for a Plan for Radioactive Discharges into Environment";
- Order of the Head of State Nuclear Power Safety Inspectorate No. 22.3-90 On the Approval of Nuclear Safety Requirements BSR-1.9.2-2011 “Derivation and Use of Clearance Levels of Radionuclides for Materials and Waste Generated during Activities in the Area of Nuclear Energy” (Official Gazette, 2011, No. 118-5608);
- Nuclear Safety Requirements BSR-2.1.2-2010 General Regulations on Ensuring of Safety of Nuclear Power Plants with RBMK-1500 Type Reactors (No 22.3-16, 2010);
- Nuclear Safety Requirements BSR-3.1.2-2010 Requirements on Radioactive Waste Handling at the Nuclear Facilities Prior to Their Disposal (No 22.3-120, 2010);
- Nuclear Safety Requirements BSR-1.8.1-2010 Requirements on Informing about Unusual Events at NPP (No 22.3-60, 2010);
- Description of the Sequence of Compulsory Training and Instructing on Radiation Protection (No V-1001, 2011);
- Rules on Licensing of Activity with the Ionising Exposure Sources (No 653, 1999, last amended 2011);
- Order of the Minister of Environment No D1-546 On the Approval of Regulation of Environmental Monitoring of Economic Entities”

(2009, last amended 2013);

- Order of the Director of Radiation Protection Centre No. 63 On Rules for Monitoring of Exposure of Personnel and Workplaces (2007);
- Lithuanian Hygiene Standard HN 73:2001 “Basic Standards of Radiation Protection” (2001, amended in 2003);
- Lithuanian Hygiene Standard HN 112:2001 “Requirements for Monitoring of Internal Exposure” (2008);
- Lithuanian Hygiene Standard HN 83:2004 "Radiation Protection of Outside Workers";
- Lithuanian Hygiene Standard HN 85:2011. Natural exposure. Radiation Protection Norms (2011);
- Lithuanian Hygiene Standard HN 52:2012 "Radiation Protection in Industrial Radiography" (2012);
- Lithuanian Hygiene Standard HN 88:2005 “Radiation Safety of the Open Ionizing Radiation Sources of Not Medical Purpose” (2005);
- Normative Document LAND 36 – 2000 “Measurement of Radionuclide Content in Environmental Components – Gamma Spectroscopic Analyze of Samples by Spectrometer with Semiconductor Detector” (2000, amended in 2005);
- Normative Document LAND 37 – 2000 “Measurement of Radionuclide Content in Environmental Components – Concentration of Caesium Dissolved in Water Employing Absorbing Filters and Estimation of Water Activity Concentration” (2000, amended in 2005)
- Normative Document LAND 64 – 2005 “Determination of Strontium-90 in Environmental Samples. Radiochemical Method” (2005);
- Order of the Director of the Radiation Protection Centre No. 46 On Approval of Danger Categories for Radiation Sources and on Approval of Rules for their Assignment (2004).

ANNEX VII. Annex to Article 16.1.3.2

List of the documents used to develop the EPP:

- Law of the Republic of Lithuania on Nuclear Energy No XI-1537;
- Law of the Republic of Lithuania on Nuclear Safety No XI-1539;
- Law of the Republic of Lithuania on Radiation Protection No XI-1540;
- Law of the Republic of Lithuania on Civil Protection No XI-635;
- National Plan for Protection of Population in Case of Nuclear Accident, approved by Order No 99 of the Government of the Republic of Lithuania dated 18 January 2012;
- Lithuanian Hygiene Standard HN 99:2011 “Population Protection Plan in the Event of a Radiological or Nuclear Accident”, approved by Order No V-1040 of Ministry of Health dated 7 December 2011;
- Lithuanian Hygiene Standard HN 73:2001 “General Radiation Safety Norms”, approved by Order No 663 of Ministry of Health dated 3 December 2001;
- Nuclear Safety Requirements BSR-1.9.3-2011 “Radiation Protection in Nuclear Facilities”, approved by Order No 22.3-95 of the Head of State Nuclear Power Safety Inspectorate dated 6 October 2011;
- “Description of the Procedure for Civil Protection Training and Exercises”, approved by Resolution No 718 of the Government of the Republic of Lithuania dated 7 June 2010;
- “General Safety Requirements for Nuclear Power Plants with RBMK-1500 Type Reactors, BSR-2.1.2-2010”, approved by Order No 22.3-16 of the Head of State Nuclear Power Safety Inspectorate dated 5 February 2010;
- “Emergency Preparedness Requirements of the Operator of Nuclear Facility (P-2008-01)“, approved by Order No 22.3-107 of the Head of State Nuclear Power Safety Inspectorate dated 24 October 2008;
- Method for the Development of Emergency Response Preparedness for Nuclear or Radiological Accidents, IAEA-TECDOC-953/R, IAEA;
- Generic Assessment Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA;
- IAEA Safety Standards Series No GS-R-2 “Preparedness and Response for a Nuclear or Radiological Emergency Safety Requirements”, IAEA;
- Plan of the Visaginas Fire and Rescue Board on Elimination and Management of Extreme Events, approved by the Director of the Fire and Rescue Department under the Ministry of the Interior of the Republic of Lithuania, dated 29 July 2010.