REPORT

OF THE SLOVAK REPUBLIC

COMPILED IN TERMS OF ARTICLE 9.1

COUNCIL DIRECTIVE 2009/71/EURATOM

Table of Content

Abbreviations

AKOBOJE	Automatized complex of nuclear power plant security system
BIDSF	Bohunice International Decommissioning Support Fund
BSC	Bohunice Processing Centre
BNS	Safety guidelines
CDF	Core damage frequency
CHO	Emergency Response Centre
DG	Diesel generator
EBO	Nuclear Power Plant Jaslovské Bohunice
ENSREG	European Nuclear Safety Regulator Group
ESFAS	Engineering Safety Features Actuation System
HCC	Main circulation pump
HVB	Main manufacturing unit
JAVYS, a. s.	Joint-stock company JAVYS (Nuclear and Decommissioning company)
LERF	Large Early Release Frequency
IAEA	International Atomic Energy Agency
MDVRR SR	Ministry of Transport, Construction and Regional Development of the Slovak Republic
MOD	Modernization and improvement of NPP V-2
MPSVR SR	Ministry of Labour, Social Affairs and Family of the Slovak Republic
MSVP	Interim spent fuel storage
MV SR	Ministry of Interior of the Slovak Republic
MZ SR	Ministry of Health of the Slovak Republic
MŽP SR	Ministry of Environment of the Slovak Republic
NIP	National Labour Inspectorate
NPP	Nuclear power plant
NPP V-1	Nuclear power plants V-1 Bohunice (1st and 2nd unit)
NPP V-2	Nuclear power plants V-2 Bohunice (3rd and 4th unit)
OECD/NEA	OECD/Nuclear Energy Agency
OHO	Emergency Response Organization
OSART	Operational Safety Review Team
PSA	Probabilistic safety assessment
PSR	Periodic safety review
RAO	Radioactive waste

RPS JZ	Representative full scope simulator of referential Unit of NI in operation
SAMG	Severe Accident Management Guidelines
SE, a. s.	Joint-Stock Company Slovenské elektrárne
SHMU	Slovak Hydrometeorology Institute
SIRM	Safety Improvement of Mochovce NPP Project Review Mission - occlusions of IAEA mission performed at Mochovce in June 1994
SR	Slovak Republic
STN	Slovak Technical Standard
TSÚ RAO	Technology for treatment and conditioning of radioactive waste
ÚJD SR	Nuclear Regulatory Authority of the Slovak Republic
US NRC	United States Nuclear Regulatory Commission
VUJE, a. s.	Joint - stock company (Nuclear Power Plant Research Institute)
WANO	World Association of Nuclear Operators
WENRA	Western European Nuclear Regulators
ZHRS	Reserve emergency Centre
ZZS	Company Health Centre

1 Introduction

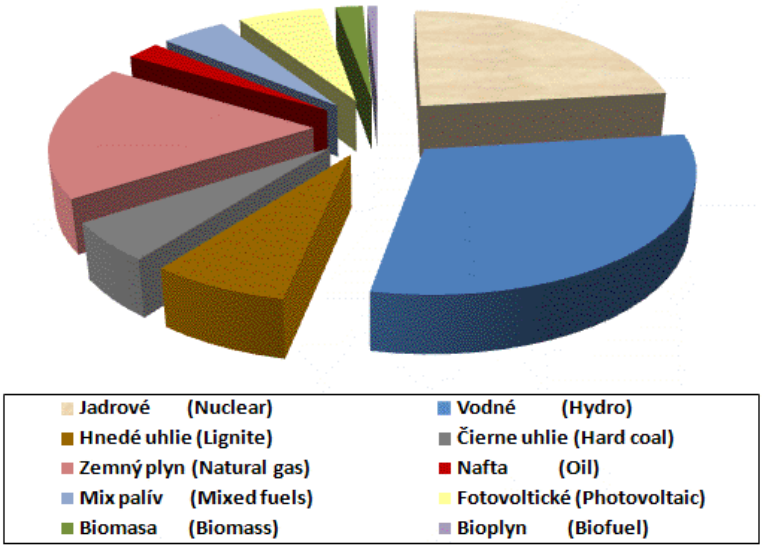
The purpose of this report is to fulfil obligations under Art. 9.1 of Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community Framework for the nuclear safety of nuclear installation. The Directive was transposed by amendment to the Act No. 541/2004 Coll. (Atomic Act). The National Report has been prepared on the basis of ENSREG Guidelines regarding Member States Reports.

By the governmental resolution No. 732 from Oct. 15, 2008 the Government of the Slovak Republic approved the Strategy of Energy Security up to 2030, the objective of which is to reach a competitive energy system ensuring safe, reliable and effective supply of all kinds of energy for reasonable prices, protecting consumers, environment protection, sustainable development, security of supplies and technical safety.

Nuclear power plants with their generation cover a significant proportion of electricity consumption in Slovakia.

INŠTALOVANÝ VÝKON ELEKTRÁRNÍ ES SR
Installed Capacity of Power plants in Slovakia

Rozdelenie podľa Palív Shared by Fuels	Výkon (MW) Power (MW)	Podiel (%) Share (%)	
Jadrové (Nuclear)	1 940	23,0	
Vodné (Hydro)	2 534	30,1	
Hnedé uhlie (Lignite)	599	7,1	Fosilné palivá Fossil fuels
Čierne uhlie (Hard coal)	440	5,2	
Zemný plyn (Natural gas)	1 540	18,3	
Nafta (Oil)	210	2,5	
Mix palív (Mixed fuels)	401	4,8	
Fotovoltické (Photovoltaic)	524	6,2	Obnoviteľné zdroje Renewable sources
Biomasa (Biomass)	168	2,0	
Bioplyn (Biofuel)	60	0,7	
Veterné (Wind)	3	0,0	
Ostatné (Other)	12	0,1	
Spolu	**8 431**	100,0	



The following objectives are relevant for future utilization of the nuclear power:

1. Short-term objectives:

    - To develop and submit for approval the licensing documentation for the next phases of decomissioning of nuclear power plants A-1 and V-1 Jaslovské Bohunice;
    - To complete phase one of decommissioning of NPP V-1 and phase two of decommissioning NPP A-1 at Jaslovské Bohunice;
    - To develop and approve a "National Policy" and a "National Program" for a responsible and safe management of SNF and RAW in accordance with the Council Directive 2011/70/EURATOM from 19 July 2011;
    - To successfully complete a program of periodic assessment of nuclear installation after the design life cycle of NPP Bohunice V-2 in compliance with the legal regulations (ÚJD SR Decree No.33/2012 Coll. until 2014);
    - To implement measures from of the National Action Plan of SR from the lessons learned from the accident at NPP in Fukushima to fulfil the conclusions from the stress tests in compliance with the ENSREG requirements until 2015 (phase I);
    - To complete the process of assessing the impact of the new nuclear source project on the environment at Jaslovské Bohunice site. Based on these results to take a decision on further continuation of the project;
    - To continue realization of completion of the NPP Mochovce units 3&4 in terms of accepted time-table;
    - To further create conditions for an effective function of the "European Nuclear Forum".

2. Mid-term objectives:

    - To put in operation in 2015 and 2016 the 3rd and 4th unit of the Mochovce NPP as the significant factor of stabilization and security of the electric power supply;
    - To realize preparatory activities and initiate authorization procedure for the new nuclear source at Bohunice site;
    - To provide for modernization and power uprate of Units 1&2 of NPP Mochovce after 2017;
    - Finalizing the concept for the back-end of the peaceful use of nuclear energy;
    - To continue in decommissioning of NPP V-1 and NPP A-1 in Jaslovské Bohunice;
    - To implement the "National Program" for responsible and safe management of SNF and RAW according to the Council Directive 2011/70/EURATOM.

3. Strategic objectives:

    - To choose the most convenient type of source, to prepare a project, to build and put in operation a new nuclear source at Jaslovské Bohunice as a significant element of energy self-sufficiency security and extension of competitive environment on the energy market;

- The fulfilment of international agreements in the field of environment, nuclear safety, investments and trade in power engineering (Kyoto Protocol, Convention on Nuclear Safety, Energy Charter, Protocol to Energy Charter, etc.);
- To prepare new projects concerning the construction of nuclear sources completing and replacing the decommissioned capacities;
- Finalizing the concept for the back-end of the peaceful use of nuclear energy.

The Slovak Government by its Resolution No. 26/2014 dated 15 January 2014 approved the updated "Strategy for the back-end of the peaceful use of nuclear energy in the Slovak Republic".

The updated Strategy for the back-end of the peaceful use of nuclear energy in the Slovak Republic includes:

- Material and time schedule of activities relating to the back-end of nuclear energy,
- Technical and technological procedure of activities related to the back-end of nuclear energy sector,
- Draft plan for financial coverage for the Strategy including proportionality between the individual sub-accounts,
- Expected impacts of contributions on the electricity prices, prices of other goods and services, on the economic and social development of the country,
- Expected impacts of contributions on the competitiveness of power producers from nuclear installations on the market in electricity in the European Union and on the relevant foreign markets in electricity,
- Impact of the proposed Strategy on the balance, security and operational realiability of the Power System of the Slovak Republic and the European Union,
- Draft plan of financial coverage of costs to manage the Nuclear Fund during the entire period of the Strategy.

By Resolution No. 256/2014 the Slovak Government approved the document "Policy, principles and strategy of further development of nuclear safety". The purpose of the document is to summarize, ensure and strengthen the principles for protection of the public and the environment from the harmful effects of ionizing radiation, which are connected with peaceful use of nuclear energy.

The document is tied to relevant strategic documents in the field of nuclear safety:

– Program Declaration of the Government for the period 2012 – 2016,

– Energy Security Strategy of SR (2008),

– Strategy of the back-end of nuclear energy sector SR

and is based on the safety fundamentals of the International Atomic Energy Agency No. SF-1.

Fig. The location of nuclear installations

Nuclear installations covered by the report

Plant	A-1	NPP Bohunice 1&2	NPP Bohunice 3&4	NPP Mochovce 1&2	NPP Mochovce 3&4	MSVP
Site	Bohunice	Bohunice	Bohunice	Mochovce	Mochovce	Bohunice
Reactor type	HWGCR	WWER-440/230	WWER-440/V213	WWER-440/V213	WWER-440/V213	Interim Spent Fuel Storage
Reactor thermal power, MWt		1375	1471	1471	1375	
Gross electric power, MWe		440	505	470	440	
Plant status	In decommi-ssionning	In decommi-ssionning	In operation	In operation	Under construction	In operation
Date of first criticality		1978 - 80	1984 - 85	1998 - 99	Under construction	
Latest update of Safety Analysis Report			2009	2010	2008	
Latest update of PSA Level 1/ Level 2		-	2010	2010 - 2011	2008, update in progress	
Last Periodic Safety Review		-	2008	2009	-	2010

1.1 Description of Nuclear Power Plant A-1

Nuclear Power Plant A-1 located at the Jaslovské Bohunice site with heterogeneous reactor KS-150, was designed for electric output of 143 MW. Natural metal uranium was used as fuel, heavy waster (D_2O) as moderator and carbon dioxide (CO_2) as coolant.

The A-1 NPP was connected to the power distribution network in December 1972. After an operational accident in January 1976 the operation was restored, after another operational accident in February 1977 technical, economical and safety analyses were conducted and on the basis of their results, in 1979 the government decided by its Resolution No. 135/79 that the operation of NPP A-1 would not be restored.

The first integrated documentation for decommissioning of NPP A-1 was developed in 1992. The currently valid concept and the time schedule for decommissioning of NPP A-1 was passed by the Government Resolution No. 227/92. Government Resolutions Nos. 266/93, 524/93, 877/94 and 649/95 approved this time schedule, including a comprehensive procedure. After the assessment of the safety report elaborated in 1996 and after completion of fuel preparation for export to the RF in 1999 ÚJD SR issued an authorization for the **first stage of decommissioning** (until 2007), i.e. to achieve the state declared in this documentation from the current base line:

- All spent fuel is removed from the long-term storage and media representing the highest potential risk are solidified or re-stored into new tanks,
- Majority of liquid operational RAW is conditioned in a form enabling safe disposal,
- Other RAW is treated into a form enabling safe disposal or their storage,
- Essential decontamination is performed aimed at further reduction of potential sources of RA material leakage.

On 18 June 2009 an authorization was issued by means of ÚJD SR Decision No. 178/2009 for the second stage of decommissioning of NPP A-1 in accordance with the Plan for the Second Stage of Decommissioning of NPP A-1, which enabled to continue with a continual alternative in the process of decommissioning of NPP A-1. The period of years 2009 and 2010 focused in particular on decommissioning of external objects of the nuclear installation of NPP A-1, on the issue of handling contaminated soil and RAW management produced by the main generating Unit of NPP A-1.

Decommissioning of the Nuclear Power Plant A-1 Jaslovské Bohunice

Phase II of decommissioning of NPP A-1 continued with the following activities:

- Decommissioning of technological equipment and structural parts of external buildings,
- Decommissioning of external tanks to the level that can be released to the environment, including reclamation of land for other uses,
- Decommissioning of technological equipment of the main reactor building of NPP A-1,

- Continuous solution for the long-term storage for NPP A-1 to store bottom sediments from the long-term storage pool and treatment of dowtherm,
- Continuation of priority removal of envinronmental burdens on buildings related to construciton of a new nuclear source,
- Pre-treatment of RAW from decommissioning into a form that can be disposed at the National Repository for RAW,
- Disposal of contaminated soil and concrete,
- Design preparation of Repository for very low active RAW at the National Repository for RAW Mochovce, including the environmental impact assessment process.

1.2 Description of the NPP V-1 units

The NPP V-1 is located Jaslovské Bohunice site.

The power plant NPP V-1 has 2 pressurized water reactors of WWER-440/230 type. The NPP V-1 unit 1 was put into operation in December 1978 and Unit 2 in March 1980.

In accordance with the Resolution of the Government of the Slovak Republic No. 809/1998 the operation of unit 1 was terminated on December 31st 2006. On December 31st 2008 the operation of unit 2 was terminated.

After removal of the spent nuclear fuel from NPP V-1 into the interim spent fuel storage (MSVP) and based on a positive opinion of the European Commission in accordance with Article 37 of the Euratom Treaty, license for the first phase of decommissioning of this power plant was issued. ÚJD SR conditioned the license with conditions in the field of radioactive waste management and modifications in the operating procedures, etc.

The scope of work of phase one of decommissioning is mapped out in detail in an integrated timetable, which is regularly monitored and updated. In this phase the activities concentrate on dismantling of equipment and removal of structures of the secondary circuit, i. e. outside the controlled zone of the nuclear power plant, which are not needed and are not suitable for any other use. At the same time preparatory works are carried out for phase two activities for the period 2015 to 2025. The subject of this second phase will be dismantling of equipment and buildings of the primary circuit of NPP located in the controlled zone that means, decommissioning of the nuclear island. The individual projects, which represent partial tasks in the entire process of decommissioning, started to be prepared gradually since 2004.

At present, 26 BIDSF projects have been completed and 16 projects are in implementation. 21 projects are in preparatory phase and we are planning to implement another 12 projects (Annex 1). JAVYS, after getting the decommissioning license, carries out activities, which represent irreversible changes on the technology of the power plant, such as the modified systems of essential service water, dismantled dieselgenerators, unit and tap-changing transformers, 220 kW substation, isolation on the equipment in the machinery room and other activities.

1.3 Nuclear Power Plant Bohunice – Units V-2

Programmes of NPP V-2 safety improvement – historical overview

The NPP V-2 is located at the Jaslovské Bohunice site. The Programme on Modernization and Improvement of NPP V-2 (MOD V-2) safety which started in 1994 was not focused only on solving of safety issues but includes also the decision of operational issues connected with 15-years operation of NPP V-2 – physical wearing and moral obsolescence of devices, causing mainly at control systems and electric system, issues concerning the operational reliability of devices, spare parts and service. The modernization programme included also measures focused on improvement of technical-economic parameters of NPP V-2 units, first of all the primary and secondary unit output regulation, improvement of efficiency and nominal unit output and improvement of their life of service.

1.4 Nuclear Power Plant Mochovce – Units 1&2

Programmes of NPP Mochovce 1&2 safety improvement – historical overview

The construction of the NPP Mochovce started in 1981. The political and economical changes resulted in the suspension of the construction in early 90´s. In 1996 a “Mochovce NPP Nuclear Safety Improvement Programme” was developed in the frame of unit 1 and 2 completion project.

The NPP Mochovce safety improvement program was based:

- on the document entitled “Safety Issues and their Ranking for NPP WWER-440/V213”;
- outcomes of the safety review conducted by RISKAUDIT in 1994;
- conclusions at the IAEA Safety Improvement of Mochovce NPP Project Review Mission – SIRM taking place at Mochovce in June 1994.

The operator of the plant in cooperation with VUJE, a. s. developed a set of technical specifications for 87 safety measures (TSSM) which were realized under the “NPP Mochovce Nuclear Safety Improvement Program”, with taking into account specific measures as identified by the RISKAUDIT and SIRM Reports and experience with NPP V-2 and NPP Dukovany units. This has introduced certain differences between the “NPP Mochovce Safety Improvement Program” and the IAEA document “Safety Issues and their Ranking for NPP WWER-440/V213” (certain measures have been added characterized as no-category measures).

1.5 Completion of the Nuclear Power Plant Mochovce, Units 3&4

Decision on siting the project NPP Mochovce

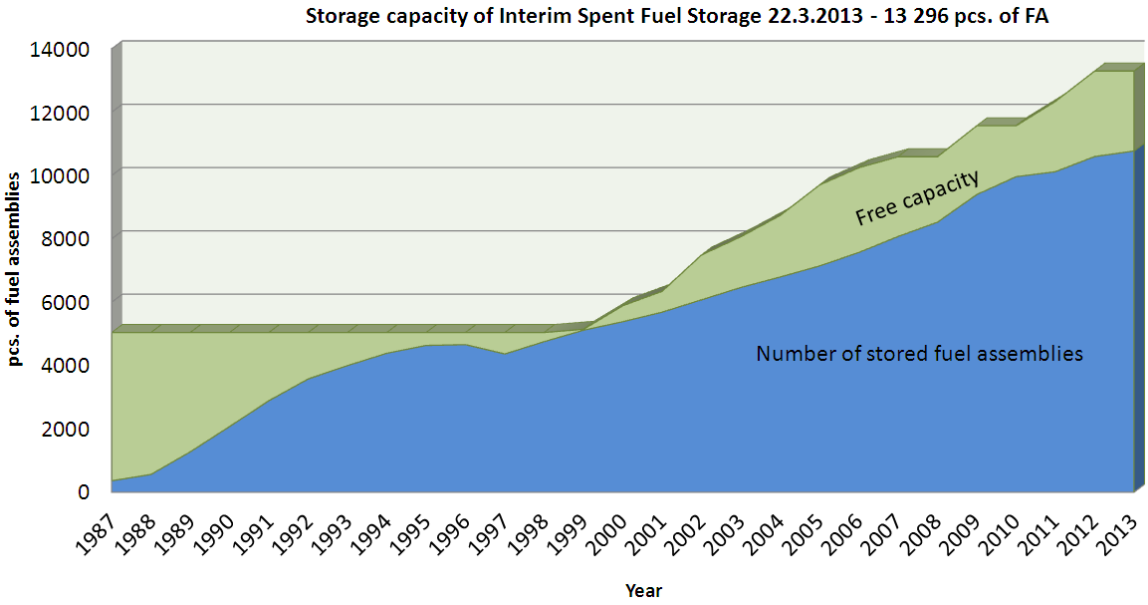
This power plant is in the phase of construction and the reactors are without fuel.

1.6 Interim Spent Fuel Storage - MSVP

Description of Used Technology

MSVP located at ht Jaslovské Bohunice site represents a nuclear installation serving for interim spent fuel storage from WWER reactors prior to its further processing in a re-processing plant, or prior to its final disposal in a repository. *It is designed as a wet storage*. It was commissioned in 1986. Its active operation began in 1987.

Spent fuel is transported to MSVP after cca 3,6-year cooling in storage pools in HVB JE SE, a. s.



2 Legislative, regulatory and organizational framework

Article 4

1. *Member States shall establish and maintain a national legislative, regulatory and organisational framework (hereinafter referred to as the 'national framework') for nuclear safety of nuclear installations that allocates responsibilities and provides for coordination between relevant state bodies. The national framework shall establish responsibilities for:*
   (a) the adoption of national nuclear safety requirements. The determination on how they are adopted and through which instrument they are applied rests with the competence of the Member States;
   (b) the provision of a system of licensing and prohibition of operation of nuclear installations without a licence;
   (c) the provision of a system of nuclear safety supervision;
   (d) enforcement actions, including suspension of operation and modification or revocation of a licence.
2. *Member States shall ensure that the national framework is maintained and improved when appropriate, taking into account operating experience, insights gained from safety analyses for operating nuclear installations, development of technology and results of safety research, when available and relevant.*

2.1 National framework

Supervision over peaceful use of nuclear energy is performed by the ministries and other central bodies of state administration and organizations within their competency as stipulated by the relevant laws.

The legal structure of regulatory activities in nuclear safety is formed by Acts, which were revised during the period of accession of Slovakia to the European Union. Some legal regulations are still valid from the period before accession (such as for example the Building Act No. 50/1976 Coll. – however, currently a new building act is under preparation).

The legal system of Slovakia can be categorized as follows:

1. The supreme fundamental law of the state is the Constitution approved by the National Council of SR by qualified majority – having generally binding nature.
2. The acts stipulate the fundamental rights and obligations specifying the principles in various areas and are approved by the Parliament – having generally binding nature.
3. Government ordinances are subordinated to laws and are approved by the Government – having generally binding nature.

4. Decrees, edicts regulations are rules issued by the central bodies of state administration (such as the ministries), to stipulate the details for implementing laws and government ordinances - having generally binding nature.

5. Slovak technical standards (STN), the European technical standards (STN EN) and international technical standards (STN ISO/IEC) – having nature of recommendations.

6. Guidelines (manuals) contain the detailed requirements and recommended steps to ensure fulfilment of requirements. These are issued by the regulatory authorities – having nature of recommendations.

7. Decision can be characterized as an act of law enforcement. This means that it is application of rights and obligations set in the generally binding legal regulation for a concrete case and a concrete entity. Decisions issued by administrative authorities are also called individual administrative acts and are binding solely internally for the regulator.

Acts on state regulation and allocation of responsibilities

Use of nuclear energy is governed primarily by the **Act No. 541/2004 Coll. on peaceful use of nuclear energy (the Atomic Act)** and on changes and amendments to certain laws as amended. The Act came into force on 1 December 2004 and repealed the original Atomic Act No. 130/1998 Coll., as well as all its implementing regulations. Meanwhile the Atomic Act has been amended eleven times already.

The Atomic Act lays down the conditions for safe use of nuclear energy exclusively for peaceful purposes in compliance with the international treaties signed by the Slovak Republic. The Act also contains clauses stipulating financial compensations in case of nuclear accident.

Act No. 575/2001 Coll. on organization of governmental activities and on organization of the central state administration as amended (the "Competence Act") sets out tasks and responsibilities of central bodies of state administration. Provision concerning ÚJD SR is included under § 29 in the currently valid Competence Act.

Act No. 251/2012 Coll. on energy sector and on changes and amendments to certain laws as amended, in effect from 1 September 2012 repealed the original Act No. 656/2004 Coll. on the energy sector. The Energy Act, is one of the fundamental laws governing the terms and conditions for doing business in the nuclear energy sector, as well as rights and obligations of natural and legal persons doing business in this field and state supervision and control of business in the energy sector.

Act No. 250/2012 Coll. on regulation in network industries and on changes and amendments to certain laws as amended governing the subject, scope, terms and conditions and method of regulation in network industries. Network industry also means the *power sector* (generation of electricity). Activities performed in network industries are considered to be regulated activities, for which license is required to be issued by the Regulatory Office for Network

Industries. The Act governs the terms and conditions for regulated activities and the rights and obligations of regulated entities and rules for *internal* market in electricity and in gas.

Act No. 24/2006 Coll. on environmental impact assessment and on changes and amendments to certain laws as amended, effective from 1 February 2006 repealed and superseded the original Act No. 127/1994 Coll. on environmental impact assessment.
In order to ensure high environmental protection, the Act governs the procedure for environmental assessment of certain types of industrial activities.

The competent authority for assessing the environmental impacts in a transboundary context is the Ministry of Environment of SR.

With the date of effect from 1 July 2006 a new **Act No. 238/2006 Coll. on National Nuclear Fund for Decommissioning of Nuclear Installations and for Management of Spent Nuclear Fuel and Radioactive Waste (the Act on Nuclear Fund)** repealed the original Act No. 254/1994 Coll. and its implementing Decree No. 14/1995 Coll. The Nuclear Fund is an independent legal entity, administrated by the Ministry of Economy of SR. The Fund has its own bodies (Board of Trustees, Supervisory Board, Director, Managers for sub-accounts, and the Chief Controller). Resources of the Nuclear Fund are varied – contributions from licensees, levies collected by the operators of the transmission and distribution systems in the prices of supplied electricity directly from the end customers (intended for settlement of the so called “historical debt“), penalties imposed by ÚJD SR, interest on deposits, subsidies and contributions from the EU funds, from the state budget and other.
The details on the method of collection and payment of the compulsory contribution, including its calculation, to the National Nuclear Fund for Decommissioning of Nuclear Installations and for management of spent nuclear fuel and of radioactive waste, are provided for in the Government Regulation No. 312/2007 Coll. as amended by Government Regulation No. 145/2012 Coll.

Act No. 355/2007 Coll. on protection, promotion and development of public health establishes requirements for the protection of public health, public health authorities, their powers, the basic conditions for registration and implementation of activities leading to irradiation, the scope of the notified and permitted activities leading to irradiation, issuing permits for these activities, obligations of natural persons and legal persons, measures to protect public health, performance of state regulation in the health sector and sanctions for the breach of obligations in the field of public health protection. Details of the requirements radiation protection under the law are laid down in the implementing Decrees of MZ SR and in the Government Regulations transposing the EU directives.

Act No. 125/2006 Coll. on labour inspection and on amendments to Act No. 82/2005 Coll. on illegal work and illegal employment regulates the labour inspection, which enforces protection of employees at work and state administration in the field of labour inspection, defines the competence of state administration authorities in the field of labour inspection, the scope of supervision according to special regulation (Act No. 264/1999 Coll. on technical requirements for products and on conformity assessment) establishes the rights and obligations of the labour

inspector and obligations of natural persons and legal entities. The relating generally binding legal regulations are listed in Annex 2.

Act No. 124/2006 Coll. on occupational health and safety establishes general principles of prevention and the basic conditions for ensuring occupational health and safety, for eliminating the risks and factors influencing the occurrence of accidents at work, occupational diseases and other health damage at work. Integral part of occupational health and safety is the safety of technical equipment. The relating generally binding legal decrees are listed in Annex 2.

In accordance with **Act No. 50/1976 Coll. on spatial planning and building regulations** (the Building Act) ÚJD SR became in 2004 a building authority *for the phase of building proceedings* for projects of nuclear installations and projects related to nuclear installation, which are located within the premises of a nuclear installation.

Convention on Nuclear Safety

Slovakia ratified the Convention on Nuclear Safety on February 23, 1995.ÚJD SR is responsible for fulfilment of obligations resulting from the Convention on Nuclear Safety.

National Reports of the Slovak Republic, within the meaning of the Convention on Nuclear Safety, are available on the website www.ujd.gov.sk.

Joint Convention

Slovakia ratified the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management on January 27, 1998. ÚJD SR is responsible for fulfilment of obligations resulting from the Joint Convention.

National Reports of the Slovak Republic, within the meaning of the Joint Convention, are available on the website www.ujd.gov.sk.

Cooperation with the International Atomic Energy Agency (IAEA)

Cooperation between the SR and the IAEA in the field of technical projects has been extraordinarily successful. Part of this cooperation is that expert missions are taking place focusing on nuclear safety review, in the health service, on evaluation of material degradation of primary circuit components, etc.

Significant part of regional projects related to issues of nuclear safety. Internships of foreign experts, seminars, workshops and trainings with broad international participation are being organized under regional projects in the SR.

Cooperation with the Organization for Economic Cooperation and Development/ the Nuclear Energy Agency (OECD/NEA)

Representatives of SR participating the government experts meeting on Nuclear Law Committee, the meetings of government experts in the Committee for Safety of Nuclear Installations (CSNI)

and the committee for nuclear regulatory activities, the committee on radioactive waste, as well as other committees and working groups.

Cooperation with the European Commission and the countries of the European Union

Representatives of ÚJD SR are attending on a regular basis meetings of expert groups of the EU Council and the European Commission with the aim to exchange knowledge on reviews of the level of nuclear safety of nuclear installations in Europe and they participate in developing the EU legislation in selected areas.

Bilateral Cooperation

Formal (on the basis of international treaties) and informal cooperation exists with all neighbouring countries (Czech Republic, Poland, Ukraine, Hungary and Austria), as well as with other countries (such as: Armenia, Bulgaria, Germany, France, Finland, Slovenia, the US). The cooperation focuses on exchange of experience in the field of peaceful use of nuclear energy, developing the system of emergency preparedness, accident analyses, etc.

Forum of state nuclear safety authorities of countries operating NPPs of WWER type

Forum of state nuclear safety authorities of countries operating NPPs with WWER type was established with the aim of mutual exchange of experiences in construction and operation of nuclear power plants of WWER type. These activities are also supported by the IAEA and other developed countries having a nuclear program. Ad hoc working groups have been set up dealing with the current issues of nuclear safety and state regulation.

Network of Nuclear Regulatory Bodies of countries with small nuclear program

Network of Regulators of Countries with Small Nuclear Program (NERS) was established in 1998 from the initiative of the Swiss Regulator (HSK) with the aim to enhance cooperation and exchange of experiences among countries with similar nuclear program. ÚJD SR has been taking an active part in the activities of NERS on a regular basis.

Nuclear Regulatory Authority of the Slovak Republic (ÚJD SR) has for example prepared the amendment of the Atomic by which the Directive 2011/70/Euratom on Radioactive Waste and Spent Nuclear Fuel Management in transposed. The amendment also contains some new provisions on an increased financing of ÚJD SR and increased limits of liability for nuclear damage. Draft amendment to the Atomic Act was approved by the National Council on 21 May 2013 and published as Act No. 143/2013 Coll. with the date of effect from 1 August 2013.

Generally binding legal regulations implementing the Atomic Act that are issued by ÚJD SR in a form of Decrees are listed in Annex 2.

ÚJD SR issues also safety guides (see Annex 3) having a recommendation nature.

Legislative rules of the Government of the Slovak Republic determine the rules for creating generally binding legal regulations in a binding way and govern the procedure of the ministries and other public authorities.

The mover of the Bill (in case of the Atomic Act it is ÚJD SR) discusses it with the competent authorities and institutions in the commenting procedure. The Bill, as modified according to the outcomes of the commenting procedure, is then submitted by the mover for discussion to the Legislative Council of the Government of SR.

The section of the government legislation of the Government Office of SR prepares its position before the Bill is submitted to the Legislative Council of the Government, and that is also from the view of conformity of the law with the law of the European Union. After approval by the Legislative Council of the Government of SR the Bill is subjected to an intra-community commenting procedure within the EU according to Articles 30 to 33 of the Euratom Treaty and according to the EU Directive 98/34 as amended by the Directive 98/48. After this process the Bill is submitted for discussion to the Government of SR.

The Bill, which was approved by the Government is submitted to the National Council of SR as government bill.

After adopting the Bill by the National Council of SR and after it is signed by the President of SR, the Act is promulgated in the Collection of Laws of SR.

Nuclear installation licensing procedure

The licensing procedure for the nuclear installation consists of five main phases, that is: siting of the nuclear installation, its construction, commissioning, operation and decommissioning.

The District Office at the seat of the region (Note: amended by Act No. 345/2012 Coll. l. with the effect from 1.January 2013) issues decisions (license) on siting a nuclear installation on the basis of approval by the ÚJD SR and other regulatory authorities (Public Health Care Office of SR, labour inspection bodies).

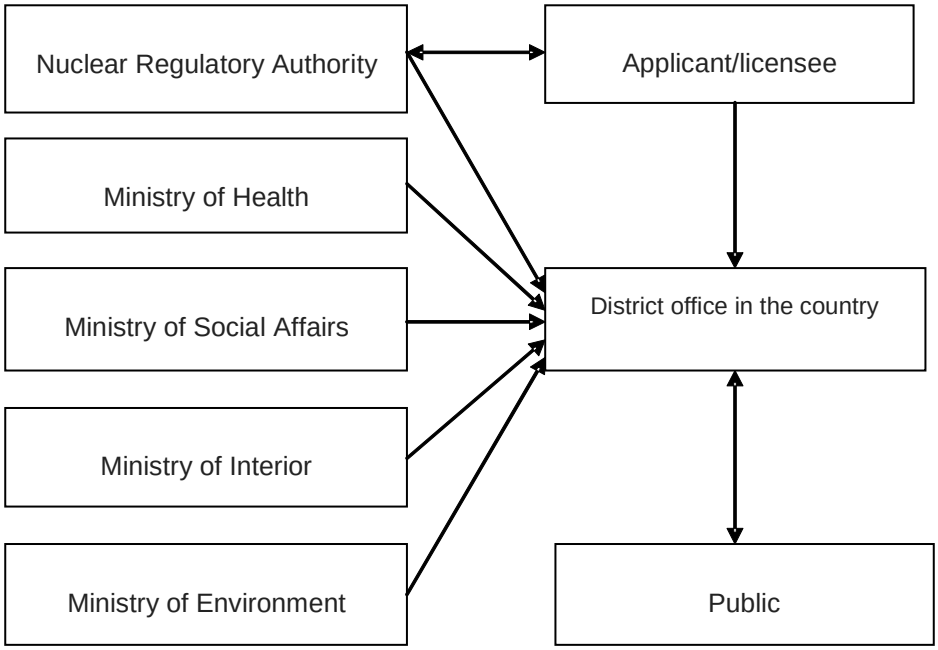


Fig. Licensing Procedure for Siting

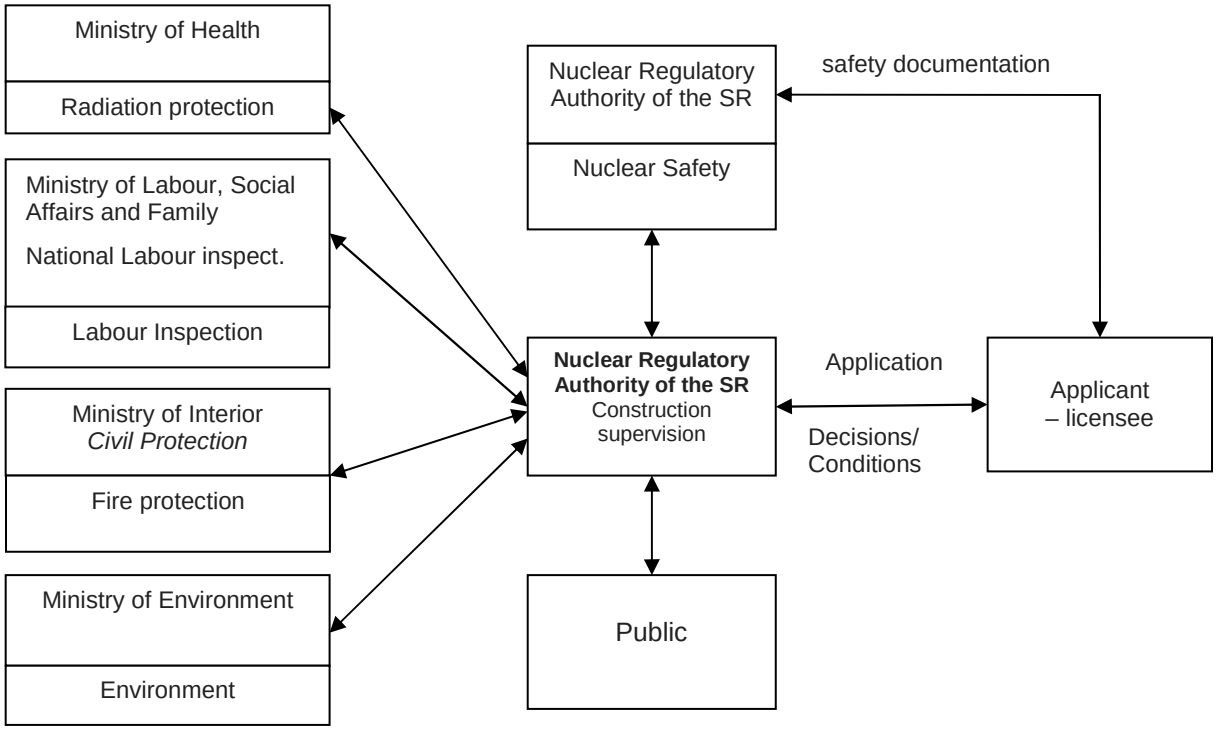


Fig. The main regulatory authorities and the licensing procedure in issuing license for construction, commissioning, operation and decommissioning

The basic condition granting a license is the elaboration and submission of safety documentation listed in annexes of the Atomic Act necessary for issuance of particular types of decisions and

meeting of legislative requirements for nuclear safety. An essential criteria is also the fulfillment of conditionsof preceding approval procedures and decisions of Regulatory Authority.

Authorization (license) to construct a nuclear installation, permit for early use (including the consent for trial operation) permit for change of construction before completion, decision permitting the use of the building (including granting of license for operation of nuclear installation) is issued by the ÚJD SR as a Building Authority. ÚJD SR exercises its competency as a construction authority and state administration authority for nuclear safety. Its decisions are based on its own decisions as well as on the opinion of relevant regulatory authorities - Public Health Care Office of SR (radiation protection), National Labour Inspectorate, Labour Inspectorate (labour inspection and safety and health protection at work), Ministry of Environment of SR (environmental impact assessment) and other bodies and organizations of state administration (fire prevention, civil protection).

Details concerning the scope, content and method of preparation of documentation needed for certain decisions are defined in the ÚJD SR Decree No. 58/2006 Coll.

In compliance with the Atomic Act (No. 541/2004 Coll. l.) Section 37 par. b,c the licenses for operation of nuclear installations are issued for an unlimited period of time.

Use of nuclear energy without permission or authorisation is prohibited (Atomic act § 3 par. 6). Nuclear energy may only be used based on a permission or an auhtorisation issued by the Authority to a natural person or a legal person.

Role of the Regulatory Authority

Pursuant to the Act No. 541/2004 Coll., ÚJD SR discharges state regulation of nuclear safety of nuclear installations, in which in particular:

- Performs inspections of workplaces, operations and premises of nuclear facilities, compliance with the limits and conditions for safe operation and safe decommissioning, quality *management* system, as well as obligations resulting from decisions, measures or regulations issued on the basis of the Atomic Act;
- Controls fulfilment of commitments under international treaties, by which Slovakia is bound in the field of competencies of ÚJD SR;
- Controls the system of staff training, training programs for professionally qualified staff, training programs for selected staff of licensees and controls professional competence of staff, as well as special professional competence of staff of licensees;
- Identifies the status, the causes and consequences of selected failures, incidents or accidents at a nuclear installation or an event during transport of radioactive materials;
- Checks performance, etc.

Public Health Authority of the Slovak Republic

State health regulation according the Act No. 355/2007 (on protection, support and development of public health) is discharged by the staff of ÚVZ and the staff of RÚVZ.

The person exercising state health regulation is, inter alia, authorized to enter lands, premises, facilities and plants and other areas of controlled entities, to request to be accompanied as necessary, to take samples in the quantity and within the scope necessary for examination, to request necessary information, documents, data and explanations, side letters/documents, technical and other documentation, to impose measures aiming at elimination of deficiencies found and block fines.

Oversight over securing radiation protection in activities leading to radiation exposure is foremost exercised by reviewing the proposal for performing the activity leading to irradiation in the phase of its licensing and then continuously depending on the nature of risk, which it represents.

Inspections at the site are frequently linked with control measurements of radiation situation and sampling performed by the persons executing the oversight.

Inspections are in most cases focusing on a special area important with respect to radiation protection.

Labour Inspectorate Nitra

According to Act No. 125/2006 on labour inspection Labour Inspectorate Nitra is authorized to execute labour inspection at nuclear facilities with a focus on checking the status of occupational health and safety, the safety status of technical equipment, the relevant documentation, accompanying technical documentation, periodical tests of classified technical equipment, and other.

After the inspection the labour inspector proposes measures, imposes measures and obligations to adopt measures to eliminate any breach of regulations found and their causes, and the obligation to submit to the Labour Inspectorate Nitra an information about fulfilment of measures aimed at elimination of breaches of regulations and their causes.

Technical Support Organisation (TSO)

One of the main pillars of safe use of nuclear energy is also services by the technical support organizations (TSO), universities and the Slovak Academy of Sciences (SAV) providing broad spectrum of necessary technical skills, which the operator or the regulator are unable to secure with their own capacity.

TSO works partially for license holders and partially for the regulator in those areas, where it is assured that there is no conflict of interest.

The activities of these TSOs focus on the area of nuclear safety in the whole spectrum, including radioactive waste and decommissioning of nuclear installations in a form of various analyses, technical reports, opinions, etc.

These organizations participate mainly on activities focusing on:

- Proposals of systems linked with design, construction, operation and reconstruction of nuclear installations;
- Development of supporting analyses focusing on, e.g. modernization of control and management system for NPP of VVER-440/V213 type, unit uprating, probabilistic analyses, etc.;
- Services in the field of computational modelling of design basis and beyond design basis accidents (including severe accidents with core meltdown) of nuclear power plants;
- Elaboration of accident analyses for Safety Reports;
- Independent review of emergency analyses for the safety reports of NPP V-2 and Mochovce 1,2;
- Consultancy in the area of safety of nuclear power plants (fire protection, improving wiring, seismic and other external events);
- Elaboration of basic technical and EIA documentation;
- Preparation of safety reports;
- Inspection of nuclear installations by using custom made manipulators and remote controlled trolleys.

Enforcement

In accordance with the license for operation the requirements for nuclear safety and conditions of nuclear safety established or approved by ÚJD SR, are being monitored. In case of breach of act the regulatory body can impose penalties to the licensee, as well as licensee's employees. In case of non-compliance with the requirements or violation of the law, the regulatory body is authorized to impose sanction to the licensee, including financial penalty.Detailed provisions are contained in the Atomic Act § 34.

In accordance with the Atomic Act (No. 541/2004 Coll.) § 32 ÚJD SR can suspend the operation of a nuclear installation.

2.2 Improving national framework

Since the entry into force of the Atomic Act (No. 541/2004 Coll. l.) there have been 11 amendments with the aim to take into account the experience gained in the implementation of this Act, as well as due to the development of international standards (IAEA, WENRA, etc.), operating experience of nuclear installations, and last but not least also due to the necessity to transpose

the EU Directives (2006/117/Euratom, 2009/71/Euratom, 2011/70/Euratom). The last amendment to the Atomic Act repealed the time limitation on the validity of the license to operate nuclear installations and are considered as licenses without time limitation.

In accordance with the amendment to the Atomic Act also the Decrees were amended, which are issued by ÚJD SR on the basis of the Atomic Act.

The last amendments of the decrees take into account the regulations (Reference levels) of WENRA group.

3 Competent regulatory authority

Article 5

1. *Member States shall establish and maintain a competent regulatory authority in the field of nuclear safety of nuclear installations.*
2. *Member States shall ensure that the competent regulatoryauthority is functionally separate from any other body ororganisation concerned with the promotion, or utilisation ofnuclear energy, including electricity production, in order toensure effective independence from undue influence in its regulatorydecision making.*
3. *Member States shall ensure that the competent regulatory authority is given the legal powers and human and financial resources necessary to fulfil its obligations in connection with the national framework described in Article 4(1) with due priority to safety. This includes the powers and resources to:*
   a) *require the licence holder to comply with national nuclear safety requirements and the terms of the relevant licence;*
   b) *require demonstration of this compliance, including the requirements under paragraphs 2 to 5 of Article 6;*
   c) *verify this compliance through regulatory assessments and inspections; and*
   d) *carry out regulatory enforcement actions, including suspending the operation of nuclear installation in accordance with conditions defined by the national framework referred to in Article 4(1).*

3.1 Competent regulatory authority

The role of the Government and of the central bodies of state administration is to exercise state administration and to secure its operation. Central bodies are ministries and other central bodies of state administration (such as ÚJD SR). Central bodies of state administration can be established only by law and have law-making (standard-making) power. They issue decrees and edicts on the basis of legal authority and prepare draft laws and ensure compliance with these.

Nuclear Regulatory Authority of the Slovak Republic (ÚJD SR)

ÚJD SR is the central body of state administration established by law (having legal personality). ÚJD SR provides for state regulation over nuclear safety of nuclear installations, including radioactive waste management and spent fuel management and other phases of fuel cycle, over nuclear materials including their control and record keeping, as well as over the physical protection of nuclear installations and nuclear materials ensured by the relevant licensee. It reviews the intents of the use of nuclear energy and the quality of classified facilities and equipment of nuclear technology as well as the commitments of Slovakia under international agreements and treaties relating to nuclear safety of nuclear installations and nuclear materials management.

Ministry of Health of the Slovak Republic (Public Health Authority of SR)

Ministry of Health is responsible for health care, health protection and other activities in the field of health service. *In addition to the MoH of the Slovak Republic, the state administration in the field of protection of public health from effects of ionizing radiation is also discharged by the Public Health Authority, the Regional Public Health Offices and special health authorities.* The competence of the Ministry includes *setting* exposure limits and conditions for the disposal and storage of radioactive waste from the view of their potential impact on health. The Public Health Authority of SR provides methodological guidance for health protection against the effects of ionizing radiation, *drafts legislation,* issues permits for activities leading to irradiation, carries out state health supervision in nuclear installations and is a contact point for the EU in the field of health protection against ionizing radiation (radiation protection).

Ministry of Environment of the Slovak Republic (MŽP SR)

Ministry of Environment of the Slovak Republic is responsible for development and protection of the environment including nature and landscape protection, protection of quality and quantity of waters, air protection, environmental aspects of land use planning, environmental impacts assessment, ensuring a unified information system on the environment and area monitoring.

The following bodies report to the Ministry of Environment of the Slovak Republic:

- The Slovak Environmental Inspectorate, through which the Ministry of Environment of the Slovak Republic fulfils its function of the main body of state supervision in the matters of environment;
- Slovak Hydro-Meteorological Institute and other.

Ministry of Interior of the Slovak Republic (MV SR)

Ministry of Interior of the Slovak Republic, besides others, is responsible for protection of constitutional establishment, public order, security of persons and property, the integrated rescue system, civil protection and fire protection.

Provides for – to the extent as determined by the government – crisis management, civil emergency planning, proposes humanitarian assistance to other countries.

In case of an accident at a nuclear installation it is involved in management and carrying out rescue services and evacuation plans, organizes and provides for warning and notification, development, operation and maintenance of the radiation monitoring network for civil protection.

It provides continuous 24 hours duty at the workplace for the performance of functions of the notification and warning centre of the Slovak Republic, the national management and coordination centre for providing and receiving international humanitarian aid, national contact point for receiving and transmitting warning messages, information reports and messages requesting help from the ERCC (Emergency Response Coordination Centre) of the European Union, the International Atomic Energy Agency in Vienna, the competent authority of the European

Commission (ECURIE) in Luxembourg and other national contact points of the neighbouring countries and of the state parties, international organizations.

Ministry of Economy of the Slovak Republic (MH SR)

Ministry of Economy of the Slovak Republic is responsible for the energy sector including management with nuclear fuel, storage of radioactive waste and energy efficiency, prospecting and exploration of radioactive materials and their mining, as well as for control of exports, transports, brokering and transit of dual use items.

Ministry of Labour, Social Affairs and Family of the Slovak Republic (MPSVR SR)

The Ministry of Labour, Social Affairs and Family of the Slovak Republic is responsible (inter alia) for occupational health and safety, and the labour inspection. The state administration in the field of labour inspection is executed by the state administration bodies: the Ministry of Labour, Social Affairs and Family of SR, the National Labour Inspectorate and regional labour inspectorates.

The Ministry of Labour, Social Affairs and Family of SR manages and controls the National Labour Inspectorate (NIP) and is responsible for performance of labour inspection. The National Labour Inspectorate is the supervisor for labour inspectorates. The Labour Inspectorate in Nitra supervises the compliance with laws and other regulations to ensure occupational health and safety at the workplaces of nuclear installations in Slovakia (Section 7 par. 1 of the Act No. 125/2006 Coll. on labour inspection and amending and complementing the Act No. 82/2005 Coll. on illegal work and illegal employment and on amendments to certain laws as amended).

Ministry of Transport, Construction and Regional Development of the Slovak Republic (MDVRR SR) and Department of Health Officer for the sector

MDVRR SR is responsible for railway, road, water and air transport, electronic communication, postal services, tourism and construction. In terms of shipments of fresh and spent nuclear fuel, MDVRR SR is one of the bodies that participate in the license process. According to Section 28 par. 13 letter c) of the Atomic Act, the Ministry of Transport, Construction and Regional Development of the SR approves the emergency transport rules that contain measures during an incident or an accident in transport of radioactive material.

Department of Health Officer for the sector issues permits for transport of fresh and spent nuclear fuel and determines the conditions for carrying out these activities, discharges state health supervision over radiation protection during transport according to the Act No. 355/2007 Coll.“

3.2 Independence of the regulatory authority

Regulation over peaceful use of nuclear energy is performed by the ministries and other central bodies of state administration within their competency as stipulated by the relevant laws according to the structure as illustrated in Figure.

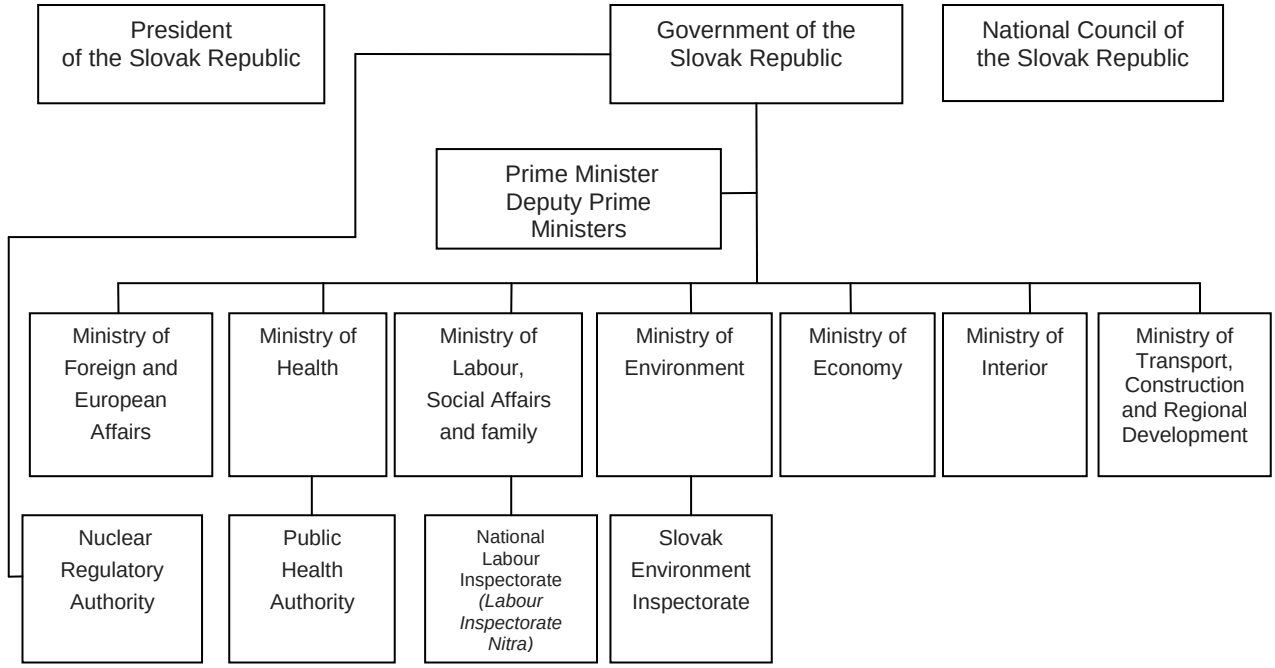


Fig. Structure of regulatory bodies

The Nuclear Regulatory Authority of SR was established on 1 Jan. 1993 and its powers result from the Act No. 575/2001 Coll. on the organization of activities of the government and organization of the central government. ÚJD SR is an independent state regulatory body reporting directly to the government and it is headed by the chairman appointed by the government. Independence of the Regulatory Authority from any other authority or organization dealing with development or use of nuclear energy is applied in all relevant areas (legislation, human and financial resources, technical support, international cooperation, enforcement tools).

Atomic Act §4 para (1) h),i)

The Authority shall present to the Government of Slovakia and subsequently to the National Council of the Slovak Republic once a year, always as at 30 April, a report on the status of nuclear safety of nuclear installations in Slovakia and on its activities for the past year.

Inform the public on

1. incidents and accidents at nuclear installations in Slovakia,
2. accidents outside Slovakia,
3. material deficiencies found by the Authority at nuclear installations and on measures adopted to remove them,
4. events during shipment of radioactive materials except classified information that are subject to protection according to special regulation,
5. other facts relating to nuclear safety of nuclear installations in Slovakia including the management of radioactive waste and spent fuel.

3.3 Legal powers and human and financial resources of the regulatory authority

The key legislation in the field of nuclear safety is the Atomic Act No. 541/2004 Coll. as amended. On the basis of this Act, ÚJD SR prepares and issues decrees and decisions as acts of law application.

In general a regulatory decision can be characterized as an individual act of law enforcement. This means that it is application of rights and obligations set in the generally binding legal regulation for a concrete case and a concrete entity. Decisions issued by administrative authorities are also called individual administrative acts. Obligations imposed by a decision are enforceable and defaulting on them is punishable. As a principle the decisions are subject to the possibility of filing an action in court for judicial review of decisions.

ÚJD SR issues various types of decisions: decision on the issue of authorization, decision on issue of license, on approval, on imposing sanction or measure, on designation of a new licensee, on verification of competence, on documentation review, and other.

In 2006 the project s"Strengthening human resources management at the Slovak Nuclear Regulatory Authority" was launched.

The project objective was maintaining a high level of safety of nuclear installations through adequate human resources management of ÚJD SR.

The main purpose of the project was to ensure the adequate human resources and adequate levels of competence to achieve and maintain through well defined training programs and tools. The training program should ensure that staff is aware of technological developments challenges, new principles and concepts.

The project was divided to 4 main tasks in accordance with the SAT (Systematic Approach to Training) methodology:

Task 1: Analysis of training needs and design of training program (including strategy for human resources development)
Task 2. Development of training materials
Task 3: Implementation through pilot course
Task 4: Evaluation

ÚJD SR approves and evaluates the annual training program for its employees. In addition, ÚJD SR has a training software at its disposal, LMS i-Tutor, which includes a training and testing module according to the demands and requirements for training. The system is on the office server and each employee has its own access code. Employees can thus deepen their knowledge of general overview (legislation, international relations, etc.) as well as their own specialization (operation, decommissioning, radioactive waste management, emergency planning, etc.). This is a form of e-learning (Computer Based Training) for employees as self-study. The training tool is regularly updated.

For year 2014 the budget breakdown ÚJD SR contained a determined total number of employees of 108, of which 91 are civil servants and 17 employees working in public interest.

Financial and human resources of the regulatory body - ÚJD SR

ÚJD SR as budget organization is connected with the state budget with its revenues and expenditures. In this connection it is necessary to state that from 1 January 2008 annual contributions have been introduced into the legal order of SR for execution of state regulation in nuclear safety. The Act No.94/2007 Coll. amending the Atomic Act, imposes an obligation to the licensees to pay annual contributions for execution of state regulation in nuclear safety. The basic principle of the adopted law is securing sufficient funding for regulatory activities relating to nuclear safety, for maintaining the expertise of its staff and for their stabilization, for safety research and it aims at reducing demand on the state budget by raising other external sources. The Act stipulates rules for determining the amount of annual contribution and the method of calculating the contribution. The amount of annual contribution depends on the type of nuclear installation and the type of issued license.

The Authority has been continuously improving its management system. In 2002 a process oriented internal quality management system was introduced with the aim to achieve more effective and more efficient fulfilment of its tasks. In the following period this management system was extended to all activities of the Authority. As the basis for quality assurance in the activities of the Authority the following standards were adopted: STN EN ISO 9001:2008 standard and the IAEA GS-R-3 documents. Partially the requirements from STN EN ISO 9004:2001 standard and other standards of STN EN ISO line are being applied. The basic document of this system is the Quality Manual formulating the Quality Policy, setting the quality objectives, which the Authority intends to achieve in relation to the population of the SR, as well as to the international community. The set quality objectives, as well as functioning of the whole system, are subject of internal audits, as well as regular annual assessments. For all processes the Authority has relevant guidelines developed, as well as system of other governing acts, management, support, inspection procedures, and other. The CAF system (Common Assessment Framework) is also used to assess and improve the activities of the Authority. Activities relating to the management system are managed by the Board for the management system headed by the chairperson of the Authority. The Board develops concept for further development of the management system. In doing this it takes into account experiences from implementing management systems in the state administration and international recommendations in the field of management of regulatory bodies for nuclear safety.

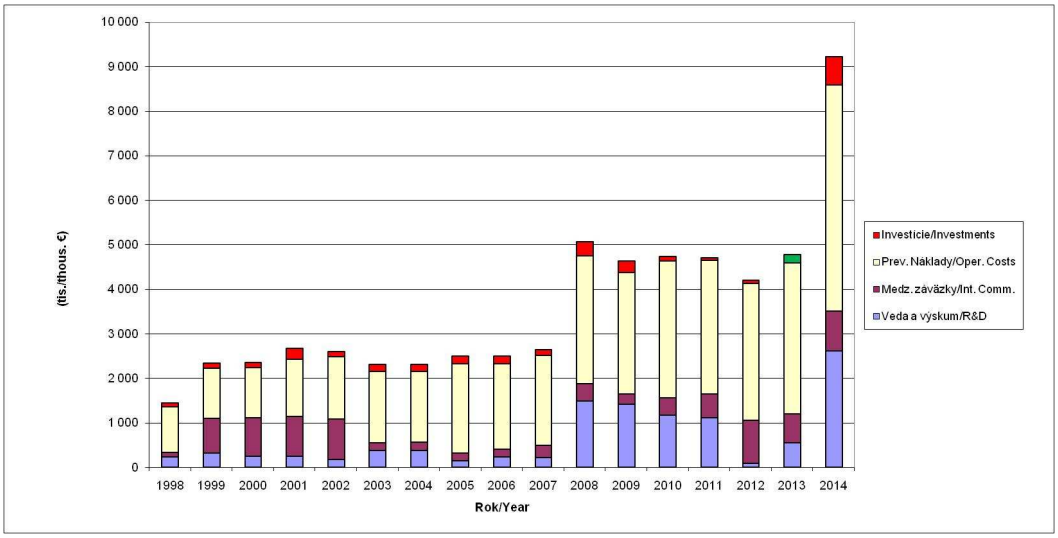


Fig. Structure of the budget chapter

Provisions of Section 10 of the Atomic Act specify the obligations, which the holder of license issued by UJD SR is required to meet under this Act. The obligations are designed to constantly monitor the nuclear safety of nuclear installations in operation to fulfill the conidtions and the documentation, which was reviewed or approved by ÚJD SR, to maintain competence levels of the staff, as well as to approach to application of modifications on the nuclear installations in operation.

It specifies the basic obligations of the license holder, which can be divided into several groups. The first group includes the obligations towards ensuring nuclear safety, emergency preparedness, etc., that are most in the public interest in order not to endanger the lives and health of the public or the quality of the environment. Another group are obligations of an administrative nature towards ÚJD SR, such as compliance with the approved documentation, providing access to the premises and provision of cooperation, establishes an obligation to update the validity of license by application for issuing an operating license, or license for the decommissioning phase, because at some point of the life cycle of a nuclear installation it is not acceptable that there would be no entity in Slovakia, which would continue in activities without a license, in particular with regard to the actual number of license holders of this type on the market in the Slovak Republic. The third very important group of obliagtions are different types of information obligations both towards the public and the ÚJD SR and towards the European Commission, or its competent authorities. Failure to comply with the obligations under Section 10 is a prerequisite for exercising accountability against the license holder.

In according the Act No. 541/2004 Coll. (Atomic Act) the Authority among others:

a) Approve
   1. types transport equipment for shipment of radioactive materials,
   2. documentation of the quality management systém of applicants for authorisation and authorisation holders,

3. requirements for the quality of nuclear installations, categorization of classified equipment into safety classes and quality requirements for classified equipment,
4. system of professional training of employees of authorisation holders
5. training program for licensed employees,
6. preliminary physical protection plan and the physical protection plan,
7. preliminary on-site emergency plans and on-site emergency plans,
8. preliminary limits and conditions for safe operation, and limits and conditions for safe operation,
9. limits and conditions of safe decommissioning,
10. commissioning program of nuclear installation broken down to phases,
11. boundaries of nuclear installation and changes thereto,
12. size of the emergency planning zone or of the common emergency planning zone of a nuclear installation and changes thereto,
13. implementation of modifications pursuant to Section 2 letter v), i. e.modifications to qualified equipment, documentation reviewed or approved by the Authority and change to the limits and conditions.

d) Verify
   1. Special professional competency of authorisation holder employees and to issue, remove or withdraw their authorisations of special professional competency,
   2. Professional competency of authorisation holders´ employees providing theoretical training and full-scope simulator training for licensed employees, and to issue, remove or withdraw certification of professional competency, etc.

In discharging state supervision, the Authority shall:

a) Perform inspections of workplaces, operations and premises of nuclear installations, operations and premises of permission or authorisation holders, while checking the performance of duties under this Act, the generally binding legal regulations issued on the basis of this Act, operating procedures issued by the authorisation holder, compliance with the limits and conditions for safe operation and safe decommissioning, quality management system, as well as obligations arising from decisions, measures or regulations issued in accordance with this Act,

b) Check fulfilment of commitments arising from the international treaties, by which the Slovak Republic is bound in the area covered by the scope of this Act,

c) Check the system of professional training of employees, training programs for professionally competent employees, training programs for licensed employees of authorisation holders and checks the professional competency of employees, as well as special professional competency of employees of authorisation holders,

d) In-situ investigation of the status, causes and consequences of selected failures, incidents or accidents at a nuclear installation or events during transportation of radioactive materials; during investigation of an incident, accident or event during transportation of radioactive materials by another authority, it takes part in this investigation as an indispensable authority,

e) Check conducting of the mandatory inspections, revisions, in-service inspections and tests of classified equipment relevant to nuclear safety,

f) Impose removal of deficiencies influencing nuclear safety, physical protection, emergency preparedness,

g) assess nuclear safety, physical protection and emergency preparedness independently from the authorisation holder,

h) check the contents, updating and exercising the emergency plans, which it approves or reviews, and the associated trainings,

i) conduct in-situ inspections at workplaces, operations and premises of applicants for permission or authorisation and holders of permission or authorisation, including controls of compliance with the quality management systems.

Inspections

The tasks in the field of state regulation are fulfilled by the ÚJD SR inspectors. The inspections are governed by "Guideline for Inspection activity of ÚJD SR". The guideline determines an integrated approach to inspections, in development and evaluation of the annual inspection plan, managing the inspection program of ÚJD SR, preparation of documentation regarding the inspection activity and analysis of inspection activity of ÚJD SR.

The inspection plan is a tool for continuous and systematic evaluation of the inspection activity at nuclear installations. As a rule it is prepared for a period of one year and it covers all areas of supervision over nuclear safety in a complex way.

Inspections are carried out according to inspection procedures, which are part of the Inspection manual of ÚJD SR. For those inspection activities, for which no inspection procedures exist, there are individual procedures for inspection being developed.

Division of inspections

In general the inspections are divided to planned and unplanned – as the first tier of division. In the second tier the planned and unplanned inspections are divided to routine, special and team inspections.

Planned inspections

Routine inspections are used by an inspector of nuclear safety to check compliance with the requirements and conditions for nuclear safety, the condition of NI, compliance with the approved limits and conditions and selected operational procedures. Routine inspections are carried out primarily by site inspectors at the relevant nuclear installations. In case of an inspection, which by its focus exceeds the professional competencies of the site inspector, the inspection is carried out by nuclear safety inspectors from the Section of safety assessment and inspection activities and

the section of nuclear regulation concept and international cooperation. Routine inspections are performed according to the procedures stated in the Inspection Manual.

Special inspections are carried out in compliance with the basic inspection plan. Special inspections focus on specific areas, in particular control of fulfilment of requirements and conditions of regulation pursuant to § 31 Act No. 541/2004 Coll.

As a rule special inspections are carried out according to procedures stated in the Inspection Manual.

Team inspectionsfocus on control of compliance with the requirements and conditions of regulation pursuant to § 31 of Act No. 541/2004 Coll. and as a general rule they are performed in several areas at the same time. Team inspection is a planned inspection of areas defined on the basis of a long-term evaluation of results of the operator, resulting from the analysis of inspection activity. Under this guideline a team inspection is an inspection, where several departments are participating.

Unplanned inspections

Unplanned inspections are carried out by nuclear safety inspectors in a form of routine, special or team inspections. These inspections are induced by the status of the NI (for example, commissioning phase of NI) or events at NI. It is a reaction of ÚJD SR to the situation that occurred at NI.

Rules valid for all types of inspections:

Inspections are basically announced in advance to the regulated entity. However, they can also be unannounced, if this is required by their focus or nature, but shall be notified no later than at the start of inspection.

The relevant site inspector is advised about the inspection at NI in advance. As a general rule the site inspector takes part in the inspection.

Each inspection, which is performed by more than one inspector, has its chief of the inspection team.

Protocol from the inspection

Each inspection must be documented in a form of a protocol or a record. Binding orders to correct the established facts form part of the protocol. They must be clearly formulated so that they impose elimination of deficiencies established and clear with unambiguously set deadlines for fulfilment.

Analysis of inspection activity

Analysis of inspection activity contains statistical evaluation of findings. The purpose of the statistical evaluation is to establish distribution and frequency of findings from the inspection activity. On the basis of evaluated development of trends in findings from inspection activity it is

possible to modify the inspection plan for the following period, in particular to those areas, where deficiencies of the regulated entity were detected the most.

1. If there is risk of default or if serious facts important in terms of nuclear safety, physical protection or emergency preparedness, the ÚJD SR shall decide about restrictions in the scope or validity of the authorisation or on imposing on the authorisation holder to carry out the necessary measures, or shall decide about the shutdown of the nuclear installation.
2. If another authority decides about shutdown of operation of a nuclear installation for other reasons, than a threat to safety, such authority is required to reimburse the authorisation holder the costs needed for securing nuclear safety and the relevant portion of costs to the National Nuclear Fund, for decommissioning of a nuclear installation, which was incurred as a consequence

This provision can be applied in case of imminent danger of default. It is applicable in extreme cases where it is impossible to use traditional regulatory means to achieve the objective pursued and where there is a threat of incalculable consequences on the lives and health of the public and the environment. Since the decommissioning of a nuclear installation brings also economic losses and shortfalls in contributions to the National Nuclear Fund, par. (2) provides that in cases of shutdown other than for safety reasons, such costs are reimbursed. Even in this provision the emphasis on the priority for safety is clear.

Offences and other administrative offences, Section 34 of the Atomic Act regulates sanctions apparatus available to ÚJD SR when finding deficiencies or failure to fulfill the obligations of natural persons or legal persons in the matters specified by this Act. In order to aggravating the sanctions ÚJD SR has the option to impose a fine up to a double of the possible fine to that entity, which did not respect the original sanction decision and did not remove the deficiencies.
It establishes also the beginning and the end of the subjective period for imposition of fine, as it is a complex issue, which requires quality evaluation of objective and subjective assumptions for accountability, rigorous analysis, opinions, statements, studying documentation, etc.

§ 34, ods. 10,11

By imposition of a fine to a authorisation holder or to other natural persons or legal persons their criminal liability remains intact, as well as the criminal liability of their employees.
Revenues from the fines are an income for the National Nuclear Fund.

In 2013 ÚJD SR imposed fines in the total amount of Euro 265 thousand.

4 License holders

Article 6

1. *Member States shall ensure that the prime responsibility for nuclear safety of a nuclear installation rests with the licence holder. This responsibility cannot be delegated.*
2. *Member States shall ensure that the national framework in place requires licence holders, under the supervision of the competent regulatory authority, to regularly assess and verify, and continuously improve, as far as reasonably achievable, the nuclear safety of their nuclear installations in a systematic and verifiable manner.*
3. *The assessments referred to in paragraph 2 shall include verification that measures are in place for prevention of accidents and mitigation of consequences of accidents, including verification of the physical barriers and licence holder´s administrative procedures of protection that would have to fail before workers and the general public would be significantly affected by ionizing radiations.*
4. *Member States shall ensure that the national framework in place requires licence holders to establish and implement management systems which give due priority to nuclear safety and are regularly verified by the competent regulatory authority.*
5. *Member States shall ensure that the national framework in place requires licence holders to provide for and maintain adequate financial and human resources to fulfil their obligations with respect to nuclear safety of a nuclear installation, laid down in paragraphs 1 to 4.*

4.1 Prime responsibility for nuclear safety

According to the § 23 Atomic Act the licensee is responsible for fulfilment of requirements concerning nuclear safety. This responsibility cannot be eliminated.

4.2 Safety of Nuclear Installations

Legislation in the field of Design and Construction

ÚJD SR Decree No. 430/2011 Coll. on the requirements for nuclear safety, specifying the details for siting, design, construction, commissioning, operation and decommissioning of nuclear installations, and in closing a repository.

The design of the reactor core and related protection systems shall ensure that limit parameters of fuel assemblies during normal and abnormal operation are not be exceeded. In case of emergency conditions, the limit failure of the fuel assemblies shall not be exceeded; it is necessary to ensure that limit parameters of fuel assemblies, which serve as the basis for design of other equipment, are not exceeded during normal operation, abnormal operation and design accidents.

Control systems shall be equipped so as to monitor, measure, register, and manage systems of relevance to nuclear safety.

Protection systems shall be capable of automatically starting up reactor protection systems, withoperating personnel having the possibility of starting up these systems manually. Protection systems shall be backed up and allow for functionality testing.

The primary circuit design principles require that sufficient strength be provided under normal and abnormal operation so as to prevent a loss of coolant and allow throughout the whole operation for periodic or continuous monitoring for the primary circuit condition and testing necessary to verify the nuclear safety.

A nuclear installation shall be equipped with a confinementto restrict, under emergency conditions involving a leakage of radioactive substances, such leaks into the environment so as to keep them below the limit values, unless the function is provided other technical facilities.

Building structures, technological systems and components of relevance to nuclear safety of the nuclear installation shall be designed, manufactured, assembled, and tested so as to ensure their reliable function. The investor - the holder of an license to construct a nuclear installation under Art. 5 (3) of the Atomic Act - shall ensure that the manufacturers and suppliers of classified equipment (equipment of relevance to nuclear safety), materials and accessories thereof are obliged to set out in the supply quality documentation the results of selected quality production checks and tests of properties of components, equipment, base material, welded joints and weld deposits, material properties and composition as well as indications and removed material defects detected by an inspection (ÚJD SR Decree No. 431/2011 Coll.) (e. g. keeping evidence samples).

Control systems shall allow for monitoring, measurement, registration, and management of values and systems of relevance to nuclear safety. Devices and actuators shall be designed and arranged so that maintenance personnel constantly have sufficient information on operation of the nuclear installation (ÚJD SR Decree No. 430/2011 Coll.). The control room shall allow for safe and reliable operation control.

The construction of nuclear installations is governed by Act of the NC SR No. 50/1976 Coll. on Land Planning and Construction (Building Act) and implementing regulations thereof, the approved Framework Quality Assurance Programme for a given nuclear installation, its Stage Quality Assurance Programme for construction and the quality assurance requirements referred to in quality plans of classified equipment during their assembly and post-assembly testing.

4.2.1 Safety Assessment of Nuclear Power Plants

Licensee holder is inter alia required to:

a) Maintain financial resources and human resources for ensuring nuclear safety, including appropriate working conditions and the necessary engineering and technical support in all areas relating to nuclear safety,

b) Fulfill reporting obligations towards the Regulator, as well as to meet continuously and assess regularly the requirements for nuclear safety to enhance nuclear safety to the highest reasonably achievable level while applying safety culture,

c) Use the pre-operational safety report and the relevant documentation pursuant to Annex 1 and Annex 2 when evaluating safety of operation of a nuclear installation, as well as any modifications to a nuclear installation and to update such documentation without any delay in compliance with the implemented modifications,

d) Give priority to safety aspects among all other aspects,

e) Enhance nuclear safety during all phases of the nuclear instalaltion and to perform periodic, comprehensive and systemic assessments of nuclear safety, taking into account the current state of knowledge in the field of nuclear safety, and to adopt measures to remove any deficiencies found and to eliminate their occurrence in the future,

f) Assess nuclear safety pursuant to subparagraph e)within the intervals and within the scope provided by the generally binding legal regulation to be issued by the Authority,

g) Issue and to follow operating procedures for activities at nuclear installation, that is for operation, maintenance, control and testing of classified equipment, which must be in compliance with the authorisation conditions; the authorisation holder is required to update the operating procedures according to the status of the nuclear installation,

h) Implement modifications to a nuclear installation after the Regulator issued its approval,

i) Maintain separate record keeping on any dodifications implemented to a nuclear installation,

j) Create a system of management of temporary and permanent modifications so that:

1. any modifications are properly designed, reviewed, checked and implemented
2. when implementing these modifications requirements for nuclear safety are fulfilled,

k) Implement modifications in a way that the number of temporary modifications implemented simultaneously is maintained on the lowest possible level,

l) Perform

- a preliminary assessment for any modification regarding its impact on nuclear safety,
- Assessment of the modification in the relevant documentation,

m) Create a system allowing the employees to report events having potential impact on the nuclear safety, and which requires from the employees to report on any events, allows and motivates the employees to report any events on the relevant management level having potential impact on the nuclear safety,

n) Evaluate operational experiences to identify covert disruption of the level of nuclear safety or potential precursors and possible trends towards reducing the nuclear safety or safety margins,

o) Ensure establishing the causes of operational events and evaluation of operational experiences, including the relevant qualification of employees,

p) Create a system for evaluation and storing information relating to feedback from operational experiences so that the employees responsible for the feedback can easily search and evaluate such information at any time,

q) Regularly evaluate and document effectiveness of the introduced system of feedback to fulfill the goals pursuant to subpar. q) based on indicators and criteria specified by the authorisation holder or by an independent natural person or a legal person,

r) Maintain adequate contact with legal entities and individuals who participated in the design and construction of a nuclear installation in order to provide feedback on operational experiences and obtaining technical assistance in case of operational events.

(3) For the purpose of increasing the level of nuclear safety the authorisation holder is required to use probabilistic assessment of nuclear safety, which focuses on identification, quantification, qualification and assessment of core indicators and aspects of nuclear safety and their interaction, while it is necessary to take into account the parameters, scope of appropriateness and the objective limitations of the probabilistic assessment depending on the type of the nuclear installation.

ÚJD SR Decree No. 33/2012 Coll. on periodic, comprehensive and systematic nuclear safety assessment of nuclear installations provides for details on the intervals and extent of the performance of regular, comprehensive and systematic evaluation of nuclear safety of nuclear installations.

The safety of nuclear installations is demonstrated through the documentation proving that its systems and equipments are capable to operate in a safe and reliable manner both during normal and also during an extraordinary event, and that the impact of the nuclear installation on its employees, the population and the environment is on an acceptable level.

ÚJD SR assesses the NPP safety preliminary to the power plant operation commencement. Safety assessment includes a systematic analysis of methods how constructions, systems and components can fail, and determines the consequences of such failures. The purpose of the assessment is to identify weak places in the project. The basic document, according to which safety is being assessed, is the Safety Report containing the description of the power plant to the extent that is sufficient for an independent evaluation of the safety features. The review of the safety report by ÚJD SR forms the foundation for issuance of license for construction and operation and proves that all safety-related issues has been sufficiently addressed.

Nuclear Power Plant Bohunice – Units V-2

Programmes of NPP V-2 safety improvement – historical overview

The Programme on Modernization and Improvement of NPP V-2 (MOD V-2) safety which started in 1994 was not focused only on solving of safety issues but includes also the decision of operational issues connected with 15-years operation of NPP V-2 – physical wearing and moral obsolescence of devices, causing mainly at control systems and electric system problems concerning the operational reliability of devices, spare parts and service. The modernization programme included also measures focused on improvement of technical-economic parameters of NPP V-2 units, first of all the primary and secondary unit output regulation, improvement of efficiency and nominal unit output and improvement of their life of service.

Safety concept

MOD V-2 was based on measures concerning elimination of deficiencies of WWER reactors mentioned in the IAEA report: IAEA EBP-WWER-03 and required by decision No. 4/96 of ÚJD SR. The project change has been prepared since 1998 through elaboration of the Safety concept part 1. (1998 – 2000) and the Safety concept part 2. (2000 – 2001).

For each task of modernization of NPP V-2, project documentation in compliance with legally binding provisions and standards was made. All tasks performed within modernization were grouped according to their relevance to the problematic and their relation to various technological facilities in order to rank them to several operational files. Measures for elimination of safety problems, for innovation of equipments and for improvement of technical and economical parameters of units are implemented in these tasks.

The program of modernization of NPP V-2 included above 50 main tasks, from which the most important were:

Following table provides a brief description and examples of some areas of the safety measures	
Issue area	**Brief description (example)**
Raising of seismic resistance of buildings, constructions and equipments with the aim:	- to secure necessary resistance, stability, integrity and functionality of buildings, constructions and equipments of seismic class 1 during seismic event on the level of maximal calculated earthquake, - to eliminate possible interactions of buildings, constructions and equipments of seismic class 2 with buildings, constructions and equipments of seismic class 1.
Fire protection – measures are aimed at:	- improvement of fire prevention – realization of fire-resistant coating of cables,

	- improvement of identification and fire extinguishment, - improvement of fire localization and prevention from its spread – replacement of fire-resistant flap valves and fire doors, spray fire-proofing of steel constructions.
Modification of technological systems for improvement of emergency situation course and cooling of reactor unit (i. e.):	- modification of injection into PRZ, relief valve and safety valves of PRZ, - improvement of cooling of MCP seals, - feedwater piping penetrations from MCP deck to SG box, - emergency degasing of PC, - adjustment of sealing assembly of primary SG collectors, - adjustment of emergency feeding of PC and supplement of PC equipments to secure residual heat removal, - transfer of feeding head pieces of SEFWS system from the floor +14,7 m, securing necessary water supply and completion of the 3rd redundancy system, - modification of ESWS system to manage cooling of NPP after seismic event and to improve the system operation.
Replacement and modification of I&C systems to improve the unit management in normal operation, transient and emergency conditions (i. e.):	- modification of functions – algorithms of automatic reactor trip system (RTS), safety system (ESFAS), technological SG protections (RLS), automatics of sequential start-up of drives, automatics of section switches, PVII (APS-ESFAS) and their integration into the system of reactor protection system (RPS), - modification of functions – algorithms of automatic power decrease, prohibition of power increase, limitations of reactor power and completion of function of RPV protection against cold pressurizing and their integration into the reactor limitation system (RLS), - replacement of the automatic reactor shutdown systems, the safety system, the technological SG protections, the automatics of sequential start-up of drives, the automatics of section switches, PVII for system RPS, and others.
Replacement and modification of electric systems to improve the power output and feeding	- replacement of sectional and subsidiary distributors 0,4 kV of I. and II. category and related cabling, respecting the requirements for separation of safety and

of the unit's on-site consumption innormal operation, transient and emergency conditions (i. e.):	operational functions, the requirements for nuclear safety, fire protection and electric safeguarding and selectivity, - replacement of 6 kV switches and adjustment of 6 kV distributors, - replacement and modification of PC and SO automatics panels, - replacement of cable hermetic penetrations and replacement of unsatisfactory cables, - replacement of accumulator batteries and completion of battery state monitoring system, - replacement of systems of control, exciting and on-site consumption DG, - replacement of output 400 kV switches and HP compressors, - replacement of electric unit protections and replacement of insulated wires.
Implementation of measures for improvement of operational economics (i.e.):	- implementation of secondary regulation of unit power, - creating preconditions for increase of efficiency and unit's thermal output to 107 % Nnom.

All tasks of the modernization project were designed and implemented in order to operate at increased power and with extended operation life of NPP V-2 until 2046. Modifications of MOD V-2 were implemented gradually since 2002 and their completion was in 2008.

Periodic Safety Review (PSR) Bohunice NPP

Preparation for V-2 PSR in frame of regulation No. 121/2003 began in May 2004. The significant factor affecting the approach to the method of realization of V-2 PSR project was the fact that the PSR run at the time when the power plant was in transition, resulting from the ongoing project on Modernization and improvement of NPP V-2 (MOD V-2), at different levels of finishing of individual modifications.

The result of evaluation was findings. The operator proposed corrective actions on the identified findings, based on which an integrated plan for implementation of corrective actions was compiled. Such integrated plan of corrective actions was part of the license No. 275/2008 permitting the operation of NPP V-2 for a period of the following ten (10) years. (Note: The last amendment to the Atomic Act repealed the time limitations on the validity of licenses for operation of nuclear installations and they shall be deemed licenses without a time limit). In compliance with this decision the operator is obliged to implement corrective actions identified during the comprehensive periodic safety review in a manner, within the scope and the deadlines as follows:

Sixteen integrated corrective actions under the group of accidents up to “Accident management up to the level of severe accidents, emergency planning, emergency control centre“.

Deadline*: 31 December 2013*

Five integrated corrective actions in the group “Design justification, methodology of defence-in-depth application“.

Deadline*: 31 December 2013*

Nine integrated corrective actions in the group “Physical condition of equipment and systems“.

Deadline*: 31 December 2010*

Nineteen integrated corrective actions in the group “Demonstration and monitoring of nuclear safety, feedback from failures“.

Deadline: *31 December 2010*

Twenty integrated corrective actions in the group “Quality, management documentation, administration and organization“.

Deadline: *31 December 2010*

Eighteen integrated corrective actions in the group “HR management and training“.

Deadline: *31 December 2010*

Nine integrated corrective actions in the group “Control of modifications, documentation and change evaluation“.

Deadline: *31 December 2010*

Five integrated corrective actions in the group “Operating procedures, documentation control“.

Deadline: *31 December 2010*

Three integrated corrective actions in the group “Evaluation of fire resistance and fire risk“.

Deadline*: 31 December 2010*

The operator informed ÚJD SR in writing at yearly intervals on the progress of implementation of these corrective actions.

Almost all of 105 the PSR corrective actions was implemented within deadlines, except one measure regarding analysis of BDB accidents arisen by external and internal event combination. Within the stress-tests an analysis of safety margins during extreme external events followed by internal events as long-term blackout, loss of ultimate heat sink, was developed. Results from this analysis including corrective actions were adopted within the National Action Plan after Fukushima Accident. Some of the measures have been already implemented, e.g. provision of mobile high pressure pump for steam generator water supply, mobile DG 0,4kV. The final Report will be submitted to ÚJD SR in 2014.

Complementary actions related to lessons learned from Fukushima and part of the Action Plan are continuously under implementation. Licence holder has to report regularly on the status of implementation which is subject of ÚJD SR inspections.

Long-term operation of NPP Bohunice V-2

Long-term operation by definition means operation of NPP beyond the originally defined timeframe. For the power plant to be operated under these conditions it is necessary to confirm its safety margins using safety assessment and taking into account the processes and characteristics of the systems, structures and components (SSC) limiting their lifetime. Correct and safe long-term operation of a nuclear power plant should be based on experience and practice of various countries in areas such as requirements in the processes of licensing operation, procedures and actions in licensing long-term operation, or implementation of periodical safety checks. From the view of long-term operation related activities are also dominating, such as ageing management and streamlining the operation.

Historically individual countries operating NPPs developed a different approach to this process.

In 2003 the IAEA launched an extrabudgetary program under the name SALTO (Safety Aspects of Long Term Operation of Water Moderated Reactors). In addition to consolidation and optimization of approaches in permitting LTO, the IAEA also pursued another objective, which was to provide methodology guidance for smaller countries, where the process of licensing long-term operation is expected.

Based on the results and conclusions of SALTO program and following the recommendations of the technical meeting on safety aspects of long-term operation and ageing management of nuclear power plants held in September 2006, the IAEA then released a safety guide SRS-57 „Safe long term operation of nuclear power plants“, which complements the safety requirements of the IAEA for ensuring safety of nuclear power plants with respect to long-term operation.

The safety guide SRS-57 „Safe long-term operation of nuclear power plants“ provides information on the best engineering practice, which may be referred to when developing the national programs of long-term operation of nuclear power plants. It provides to the operator and to the regulatory authorities expert guidance for demonstrating and verification of safety of nuclear power plants. This safety guide also formed the basis for the preparation of guideline for the international peer reviews focusing on the safe long-term operation „Guidelines for peer review of long term operation and ageing management of Nuclear Power Plants“.

The main objective of the project of approving long-term operation of NPP Bohunice V-2 is to demonstrate that all affected equipment (SSC) will perform their safety functions throughout the considered period of 60 years, while meeting all safety requirements applicable to them. All power plant activities related to approval of long-term operation are in compliance with the current legislation, which from 1 March 2012 is represented by the ÚJD SR Decree No. 33/2012 Coll. on regular, comprehensive and systemic (Note: periodical) assessment of nuclear safety of nuclear installations. The nuclear operator must demonstrate compliance with Sections 18 to 20 of this Decree, while this must be done not later than 12 months before the expiry of the original life of the power plant as contemplated by the design.

International Nuclear Safety Reviews

At the request of the Government of the Slovak Republic, an IAEA Operational Safety Review Team (OSART) visited V-2 in 2010. The purpose of the mission was to review operating practices in the areas of Management organization and administration: Operations; Maintenance; Technical Support; Radiation protection; Operating Experience; Chemistry; and Emergency planning and preparedness. At the request of the plant the team also reviewed the Long Term Operation (LTO) programs. In addition, an exchange of technical experience and knowledge took place between the experts and their plant counterparts on how the common goal of excellence in operational safety could be further pursued.

In 2012 an OSART Follow-up took place and concluded that: 9 of the issues had been resolved, 10 issues had made satisfactory progress to date and there was no issue where insufficient progress had been made.

OSART conclusion: “The willingness and motivation of plant management to consider new ideas and implement a comprehensive safety improvement programme was evident. It must be borne in mind that this was accomplished at a time period when the plant workload was greatly increased as a result of actions it had to take following the Fukushima accident”.

Nuclear Power Plant Mochovce – Units 1&2

Programmes of NPP Mochovce 1&2 safety improvement – historical overview

The construction of the NPP Mochovce started in 1981. The political and economical changes resulted in the suspension of the construction in early 90´s. In 1996 a “Mochovce NPP Nuclear Safety Improvement Programme” was developed in the frame of unit 1 and 2 completion project.

The NPP Mochovce safety improvement program was based:

- on the document entitled “Safety Issues and their Ranking for NPP WWER-440/V213”;
- outcomes of the safety review conducted by RISKAUDIT in 1994;
- conclusions at the IAEA Safety Improvement of Mochovce NPP Project Review Mission – SIRM taking place at Mochovce in June 1994.

The operator of the plant in cooperation with VUJE, a. s. developed a set of technical specifications for 87 safety measures (TSSM) to be implemented under the “NPP Mochovce Nuclear Safety Improvement Program”, with taking into account specific measures as identified by the RISKAUDIT and SIRM Reports and experience with NPP V-2 and NPP Dukovany units. This has introduced certain differences between the “NPP Mochovce Safety Improvement Program” and the IAEA document “Safety Issues and their Ranking for NPP WWER-440/V213” (certain measures have been added characterized as no-category measures).

Following table provides a brief description and examples of some areas of the safety measures	
Issue area	**Brief description (example)**
General	- question of classification and qualification of components.
Reactor core	- risk of undesirable positive reactivity as a consequence of an uncontrolled drop of boric acid concentration in the nuclear steam supply system (NSSS).
Component integrity	- tightness of NSSS components in all operating modes, including emergency modes.
Technological systems	- modification of technological systems in order to improve performance of safety functions (piping re-routing, addition of valves at piping lines, etc.).
Instrumentation & Control	- modification of instrumentation and control systems in order to improve performance of safety functions (modifications to emergency protection systems, addition of diagnostic systems, etc.).
Electrical systems	- modification of electrical systems in order to improve performance of safety functions (improvement in reliability of emergency power supply systems – diesel generators, batteries, etc.).
Containment	- comprehensive assessment of the radioactive material confining barrier in case of emergency (thermal-hydraulic calculations of containment conditions in case of accident, strength calculations of the bubble-condenser system in case of accident, etc.).
Internal risks	- minimisation of internal risks which could result in the loss of ability of safety systems to perform their safety functions (fire, internal flooding, turbine missiles, fall of heavy loads, etc.).
External risks	- minimisation of external risks which could result in the loss of ability of safety systems to perform their safety functions (earthquake, aircraft crash, other industrial activities – gas explosion, etc.).
Emergency analyses	- re-calculation of a set of emergency analyses in order to prove the NPP safety in the pre-operational safety analysis report.
Operation	- improvement of NPP safety during operation through improvement of procedures used (operating

	procedures, emergency procedures, performance of tests and inspections, investigation of unusual events, radiation protection of personnel, emergency planning, etc.).

By decision No.: 318/98 ÚJD SR approved the start up of the 1st unit – imposing conditions for its operation (e. g. setting deadlines for additional safety improvement measures).

Periodic Safety Review (PSR) Mochovce

Periodic review was conducted on the basis of ÚJD SR Decree No. 33/2012 Coll. on periodic nuclear safety review.

The result of the review were reported to ÚJD SR in a final report. The operator proposed corrective actions on the identified findings, based on which an integrated plan for implementation of corrective actions was compiled. As for the timing for implementation of integrated corrective actions in individual groups account was taken of the time required for preparation of the design documentation, the practical options for the implementation of individual design changes and of complexity of implementation for individual groups of measures.

The operator is obliged to implement corrective actions identified during the comprehensive periodic safety review in a manner and within the scope and deadlines imposed by the ÚJD SR Decision No. 100/2011 as follows:

Seventeen integrated corrective actions in the group “Accident management up to the level of severe accidents, emergency planning, emergency control centre“.

Deadline: *31 December 2018*

Nine integrated corrective actions in the group “Design justification, methodology for defence in depth application“.

Deadline: *31 December 2018*

Eleven integrated corrective actions in the group “Physical condition of equipment and systems“.

Deadline: *31 December 2013*

Seventeen integrated corrective actions in the group “Demonstration and monitoring nuclear safety, feedback from failures“.

Deadline: *31 December 2013*

Twenty integrated corrective actions in the group “Quality, management documentation, administration and organization“.

Deadline: *31 December 2013*

Twelve integrated corrective actions in the group “HR management and training“.

Deadline: *31 December 2013*

Three integrated corrective actions in the group “Control of modifications, documenting and change evaluation“.

Deadline: *31 December 2013*

Twenty two integrated corrective actions in the group “Operating procedures, documentation control“.

Deadline: *31 December 2013*

Three integrated corrective actions in the group “Evaluation of fire resistance and fire risk“.

Deadline: *31 December 2013*

To implement seismic resistance at NPP Mochovce 1&2 to a new value of seismic hazard PGA = 0.15g on the basis of review conducted in compliance with the IAEA guide NS-G-2.13 from 2009.

Deadline: *31 December 2018*

Demonstrate the method for radioactive ion exchangers management including their final disposal.

Deadline: *31 July 2011*

Based on the periodic safety review the operating license was extended by ÚJD SR Decision No. 100/2011 for another 10 (ten) years. The last amendment to the Atomic Act repealed the time limit on validity of operating licenses for operation of nuclear installations and these are deemed to be licenses without time limitation.

The license holder informs ÚJD SR in writing every year on the progress of corrective actions.

All corrective actions arising from PSR are implemented in compliance with the conditions contained in the PSR Final Report on NPP Mochovce. Complementary measures concerning lessons learned from Fukushima events and part of the Action Plan are being implemented. The license holder sends regular reports on the status of implementation, which is subject to inspections by ÚJD SR.

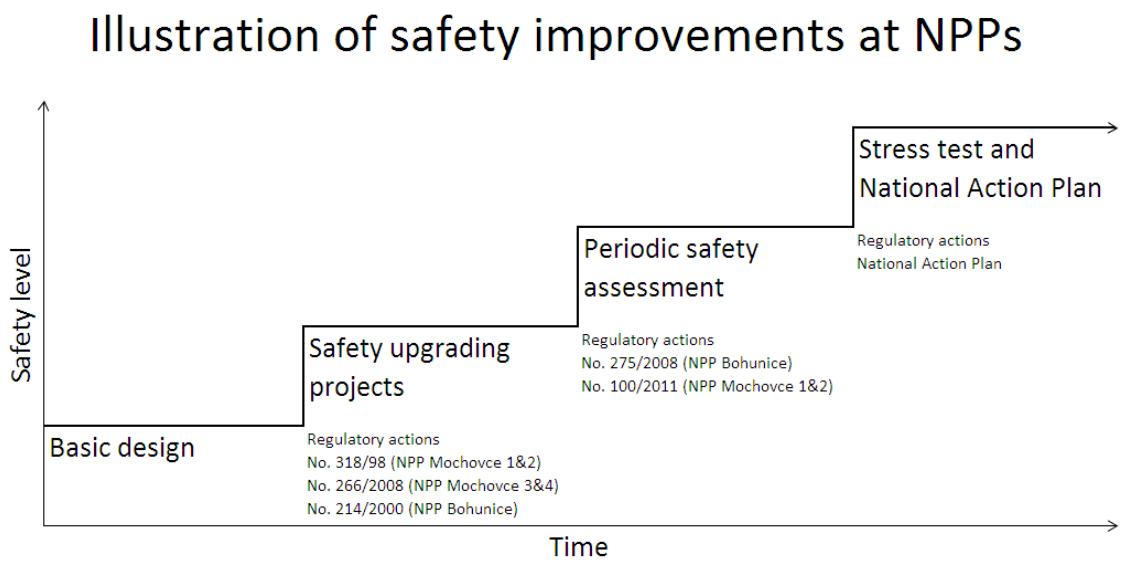
All corrective actions are implemented in compliance with the time schedule and the report on fulfilment of corrective actions (CA) is sent to the regulatory authority - ÚJD SR. Report on fulfilment of CA from phase 2 of PSR was sent to ÚJD SR on 15 December 2013. In accordance with the requirement of ÚJD SR complementary information was provided to the Report on fulfilment of CA from phase 2 of PSR in April 2014.

Some examples of implemented measures to improve safety:

Fig. Installation of passive autocatalytic hydrogen recombiners

Fig. Bottom part of reactor shielding with floats for outside-zone cooling of RPV

Fig. Alternative coolant system – RPV flooding with corium and containment spray system



Completion of the Nuclear Power Plant Mochovce, Units 3&4

Decision on siting the project NPP Mochovce

This power plant is in the phase of construction and the reactors are without fuel. In accordance with Article 2 of the CNS this power plant is not subject to the Convention, however for reasons of transparency, basic information about the state of construction and on the measures to improve safety are given here.

ONV Levice, department of construction and territorial planning, the then building authority, issued its permit for siting the construction on 22 October 1980 (decision under No. Výst. 3865/1980), which was complemented with a decision issued on 10 July 1981 under No. Výst. 2044/81 and on 28 January 1982 under No. Výst. 3818/81.

Building Permit for NPP Mochovce

The application for the building permit of NPP Mochovce was delivered to ONV Levice, department of construction and territorial planning (the then competent building authority) on 24 September 1986. On 12 November 1986 ONV Levice, dept. of construction and territorial planning issued the building permit under No. Výst. 2010/1986 including conditions, by which it permitted the construction of NPP Mochovce. One of the condition was that the project will be completed within 115 months (after the political changes – Slovakia became independent).

In 1997, the then competent building authority – the Regional Office in Nitra, environmental department – issued its decision No. 97/02276-004 dated 5 May 1997, by which it extended the period for completion of the NPP Mochovce project until 31 December 2005.

In 2004, in another proceeding the Regional Building Authority in Nitra, under Section 68 of the Building Act in proceeding for a change of construction before its completion, on 15 July 2004 issued its decision No. 2004/00402-07, by which it changed the original building permit so that point No. 5 of the binding conditions for implementing the project reads: "Period for project completion is determined to be by 31 December 2011", by which it extended the period for project completion until 31 December 2011.

By the decision No. 1124/2013 of ÚJD SR the new deadline for completion of the NPP is 31st December 2016.

By decision No. 246/2008 dated 14 August, 2008 ÚJD SR issued the consent with realization of changes of selected equipment influencing the nuclear safety in the extent of initiation project (based on the building code). By the ÚJD SR decision No. 267/2008 dated 14 August, 2008 ÚJD SR issued (based on the Atomic Act) the consent with realization of changes in the document "Preliminary Safety Report of NPP Mochovce, units 3&4.

Following table provides a brief description and examples of some areas of the safety measures	
Issue area	**Brief description (example)**
I&C Improvements	- increase of control and monitoring capacity of NPP, - implementation of predictive and supervision functions, - increased redundancies, - improved HMI (introduction of the Safety Parameters Display System), - qualification of set of PAMS signals for SA conditions

	and inclusion of new, dedicated signals for the SAM strategy, etc.
MCR habitability in case of a Severe Accident	- in case of severe accident with radioactive releases reaching the suction of MCR ventilation line: MCR will be isolated and provided with pressurized fresh air from dedicated reservoir tanks to provide slight overpressure in MCR and prevent the penetration of radioactivity or toxic gases from surroundings etc.
Improved design of electrical systems	- possibility of interconnecting safety bus-bars of corresponding safety divisions of adjacent units (solution for SBO), - creation of a 6-kV highway among 4 units that allows - long-term management of SBO scenarios, - higher flexibility for management of faults of electrical equipment (transformers, etc.), - goal: achieve additional, independent and highly-reliable source of power for each Unit, - possibility of feeding I&C safety systems from both DC and AC sources (from inverters), - provision of a SBO Common Diesel Generator for Units 3&4.
Improved Fire Protection	- measures identified to reduce the fire risk in NPP Mochovce 3&4 represent an improvement with respect to NPP Mochovce 1&2, - fire detection system has been improved, - all cables will be fire-retardant, - safety-classified cables will be fireproof, - cable channels and rooms and sensitive parts of the plant (both in nuclear and conventional part) will be equipped with a fixed fire extinguishing system.
Seismic upgrade	- upon request of ÚJD SR, the PGA for the seismic upgrade of NPP Mochovce 3&4 has been increased to 0,15 g.
Protection of Containment Function	- in-vessel retention strategy for the core debris cooling (avoidance of: containment basemat melt-through, containment over-pressurization, direct containment heating, source term reduction), - engineering passive features for hydrogen control (avoidance of: hydrogen uncontrolled

	burning/detonation), - prevention of high-pressure core-melt scenarios, - installation of additional power supply for station-blackout severe accident scenarios (increase the availability of containment protective active systems) , - additional instrumentation for severe accident scenarios, etc.

Fig. Seismic upgrading of the stand for portable seals (EMO 3&4)

Fig. Seismic upgrading of the I&C (instrumentation & control systems) room in the main reactor building (EMO 3&4)

International nuclear safety reviews

Based on WANO recommendations during the period from April to October 2011 the non-standard tests and inspections of equipment important for coping with extreme conditions exceeding the basic design were successfully performed on the operating units.

The tests included verification of long-term operation of diesel generators, the possibility of gravity make-up of cooling water from the bubbler condenser into the spent fuel pool, supply of feedwater to steamgenerators from mobile source, replenishment of water from the cooling towers into the system of essential service water, cooling water replenishment from the dam using helicopter, connecting backup source of power from the hydro power plant, etc. Among the short-term measures there were findings identified during inspections at both NPPs immediately after the events in Fukushima, according to the WANO SOER 2011 - 2, 3, 4 documents.

4.3 Accident analyses of Nuclear Installations

4.3.1 Accident analyses of NPPs

Stress Tests

Several ENSREG recommendations adopted on the basis of the stress tests coincides with the on-going projects on, such as:

1. Implementation of measures for severe accident management (SAM) such as:
   - To analyse the necessity of filtered venting of the containment to support SAM,
   - To analyse a response to severe accidents at multi units at the same site.
2. NPP resistance against risks with very low probability of occurrence (occurrence less than 1.10^{-4}/year)
   - External floods (spreading of floods inside the power plant, drain system capacity etc.),
   - Seismic event.

Actions resulting from the stress tests, as well as other measures of ÚJD SR and MoI SR are included under an Action Plan. Some of them have already been implemented, or are in advanced stage of implementation. The tasks are divided into the following groups:

- Short-term – to be completed by 31/12/2013,
- Medium-term – to be completed by 31/12/2015,
- Additional measures, which may result from analyses defined by medium-term measures, will be implemented after 2015.

Tasks are completed keeping the time schedule of the Action Plan. The plant is continuously evaluating these tasks which are reviewed and assessed by inspections performed by ÚJD SR. Latest inspections were performed in December 2013 and January 2014. Regarding the strengthening of systems, structures and components (SSC) in case of extreme weather conditions, plan was developed for implementation of additional measures. The time schedule for the implementation of these measures is discussed with ÚJD SR. The Action Plan is published on the web site of ÚJD SR (http://www.ujd.gov.sk/files/Zatazove_testy/Narodny_akcny_plan_SR-final.pdf).

Methods of nuclear safety assessment

In the present time, there are two mutually supporting methods used for assessment and verification of NPP safety in the design. Those are the deterministic and probabilistic methods. These methods are used also later during the operation of the power plant, when planning modifications on the power plant and during evaluation of operational experience.

Probabilistic safety assessment (PSA)

The first PSA study in Slovakia was elaborated for NPP V-2 in 1995 within the comprehensive safety assessment of NPP V-2. Subsequently the PSA study has been updated several times, it was expanded and its quality was improved, utilizing the specific data and supporting analyses carried out for the given NPP. The PSA study is being updated every time when there is a material modification in the design of NPP, in the operating regulations, data, methodology used, or when new facts are found that materially change the information contained. The PSA studies are being elaborated according to the generally binding legal regulations of SR, ÚJD SR guides and good practice, which are based on the IAEA guides (such as, for example: Procedures for Conducting Probabilistic Safety Assessments of Nuclear Power Plants (Level 1), Safety Series No. 50-P-4, IAEA, July 1992; Probabilistic Safety Assessment for Seismic Events, TECDOC-724, October 1993; Human Reliability Analysis in Probabilistic Safety Assessment for Nuclear Power Plants, Safety Series No. 50-P-10, IAEA, December 1995), the US NRC guides (such as, for example: Individual Plant Examination: Submittal Guidance, NUREG-1335, U. S. Nuclear Regulatory Commission, August 1989), the OECD/NEA documents and recommendations of the European Commission. Results of the PSA studies elaborated since 1995 show a gradual reduction both in CDF and LERF, which is a result of increasing safety of NPP V-2.

The last PSA study for NPP V-2 was completed in 2012. This study, however, does not take into account the actions adopted after the Fukushima events. Its scope is summarized in the following table a).

Level 1	Level 2	Initiating events		Power operation	Shutdown unit
		Internal	External		
Yes	Yes	Yes	Yes	Yes	Yes

Table a): Scope of the PSA study for NPP V-2

The PSA studies are being reviewed by the ÚJD SR, the technical support organizations of the regulator and also by the IAEA missions. The results of PSA studies are used to review safety, in support of improving safety.

Monitoring of risk in real time – program environment Risk Monitor EOOS

The Risk Monitor EOOS is an analytical software tool for risk monitoring in real time. It is used for an assessment of imminent risk based on the current unit configuration. It enables the nuclear power plant personnel to execute operational decisions to minimize risk during the unit operation, as well as maintenance.EOOS includes CDF and LERF monitors.

Development of PSA studies for NPP Mochovce Units 1&2 follows the same rules and the same methodology as the PSA studies for NPP V-2. The PSA study for NPP Mochovce Units 1&2 was last updated in 2011. The scope of the PSA study is summarized in the following table b).

Level 1	Level 2	Initiating events		Power operation	Shutdown unit
		Internal	External		
Yes	Yes	Yes	Yes	Yes	Yes

Table b): Scope of the PSA study for NPP Mochovce Units 1&2

The PSA studies are reviewed by ÚJD SR, by the technical support organizations of the regulator and the operator, and possibly by the IAEA missions. Results of the PSA studies are used for safety assessment, to support safety improvement, as well as to support safe operation of NPP Mochovce.

Risk monitoring in real time – Safety Monitor software environment

Since 1 January 2004 the risk monitoring at NPP Mochovce Units 1&2 is done by using the analytical software tool, the Safety Monitor. The tool is used to assess the immediate risk on the basis of current unit configuration. It enables the NPP staff to take operative decisions to reduce the risk during power operation or duringdecreased output operation, or when reactor is shutdown. The Safety Monitor includes both CDF and also LERF monitors.

Deterministic safety analysis

A significant role in the process of safety assessment was accomplished in cooperation with the IAEA, that conducted a few tensof missions focused on verification of design and operational safety of nuclear power plants. The assessment results created a whole set of documents summarizing deficiencies in respect to nuclear safety, which are contained in documents IAEA TECDOC 640 WWER 440/230 Ranking of Safety Issues and IAEA-EBP-WWER-03 Safety Issues for WWER 440/213 and their Ranking. These documents have become a foundation for determination of program for safety improvement of reactors of V230 and V213 type. Details on the safety assessment are provided under Chapter 2. Deterministic analyses are elaborated on the basis of relevant IAEA documents (such as: Accident Analysis for Nuclear Power Plants. Safety Report Series No. 23, IAEA, Vienna, November 2002; Accident Analysis for Nuclear Power Plants with Pressurized Water Reactors. Safety Report Series No. 30, IAEA, Vienna, November 2003; Accident Analysis for Nuclear Power Plants. Specific Safety Guide SSG-2, IAEA, Vienna, 2009; Best Estimate Safety Analysis for Nuclear Power Plants: Uncertainty Evaluation. Safety Report Series No. 52, IAEA, Vienna 2008) and the WENRA recommendations (such as: Harmonization of Reactor Safety in WENRA Countries. Annex 1, Issue E – Design Basis Envelope for Existing Reactors and Issue F – Design Extension for Existing Reactors. Report by WENRA Reactor Harmonization Working Group. WENRA, January 2008).

ÚJD SR performs independent operational safety assessment with the support of safety indicators. An event analysis, which pursues the elimination of events repetition and the utilization of experience on national level, is also important in respect to the operational safety. ÚJD SR also uses experience from events on international level (IRS/IAEA / NEA/OECD).

Periodic safety review (PSR)

By periodic safety review ÚJD SR gets involved in the assessment process, which is carried out by the licensee. For periodic safety review the relevant IAEA documents are used (such as, Periodic Safety Review of Nuclear Power Plants, IAEA, Safety Guide No. SS-G-25, Vienna, 2013), as well as other WENRA documents.

Verification of safety of operation of NI by the licensee

The nuclear installation operator, pursuant to the ÚJD SR Decree No. *430/2011* Coll., is obliged to develop *quarterly and* annual operational safety assessment pursuant to the defined content utilizing the IAEA TECDOC-1141 document: "Operational safety performance indicators for nuclear power plants" and TECDOC-1125 "Self-assessment of operational safety for nuclear power plants". Comprehensive system of assessment is presented by a set of indicators and it is divided into four levels. The top level is the safe operation of nuclear installation and it is characterized by three main attributes:

- Smooth operation,
- Positive approach to safety,
- Low risk operation.

The attributes are not measurable directly, and therefore the structure is extended to another three levels. Level four represents specific indicators, which are directly measurable.

In 2003 safety indicators were developed for all nuclear installations on the basis of recommendations from the IAEA TECDOC-1141 document, *which are continuously revised (updated).*

In 2004 the trial operation of the new safety assessment system was completed at SE, a. s. The system is supported by the database software PPRC. In 2006 the system of safety assessment - PPRC (Power Plant Risk Control) was upgraded and renamed to SPUB (System of operational safety indicators).

In 2011 an update of the whole system of safety assessment was completed in relation to the processes introduced by the management of NPPs. The system of safety indicators was complemented with a number of new indicators to monitor individual processes. The updated version was reflected also in the SPUB software so to create new functionalities supporting the generation of reports in the required time periods. The system is described in detail in the methodology guide SE/MNA-171.01 – Safety assessment in operation of nuclear installations of SE, a. s.

By means of this software it is possible to enter, collect, keep records and evaluate the indicators. Based on the entered actual values and the set evaluation criteria, the software evaluates the safety status of the NI in a transparent manner. Evaluation of indicators can be done in four levels and at the same time it is presented in four colour distinct zones. Furthermore, the software

allows data archiving, tracking indicator trends, generating uniform reports and comparisons of achieved results.

The assessment results are processed by the operators on a quarterly and annual basis and presented in a form of report on the status of operational safety of nuclear facilities of SE, a. s.and sent to the regulatory body, ÚJD SR.

In case any degradation of status in any of the areas under safety assessment is indicated, corrective actions are adopted aimed at preventing further degradation of operational safety.

Ageing Management Programs

The process of ageing management has been systematically implemented in SE, a. s., since 1996. The objective of ageing management is to ensure safe and reliable operation of units, to minimize unplanned shutdowns and to create conditions for long-term operation of 60 years. The requirements for ageing management are defined in the safety guide BNS I.9.2/2014 "Ageing management in nuclear power plants", issued by the Nuclear Regulatory Authority of SR and in the safety standard NS-G-2.12 issued by the IAEA. An internal document for ageing management is the methodological guide "Ageing of systems, structures and components of NPPs". This document describes the process of ageing management, defines the organizational arrangements, the system for developing ageing management programs, the content structure and the scope of individual ageing management programs. Currently there are 15 ageing management programs defined, which are common for both nuclear power plants Bohunice and Mochovce.

Severe Accident Management

The project to develop severe accident management guidelines (SAMG) had been implemented over 2002 - 2004 under the joint project for NPPV-2 and NPP Mochovce. SAMG were developed in co-operation with Westinghouse Electric Belgium with a view to ensuring the utmost consistence with regulations on emergency conditions and continuously covering the area of management of accidents of all gravities. SAMG are to be used in the Technical Support Centre and in the main control room. The guidelines were being developed for the state of V-2 and Mochovce after making a set of hardware modifications securing a higher success probability of applicable strategies. For this reason, putting SAMG in practice is linked to the performance of hardware modifications.

The essence of the “Severe Accident Management“ project, a safety concept for severe accident management was developed and approved at SE, a. s.in 2009.

SAM Project was completed in NPP Bohunice V-2 and all important hardware modifications needed for successful mitigaion of consequences of severe accidents were implemented and on the basis of specific implementing projects of modifications the SAMG guidelines were updated and released for use. The project addressed updating of SAMG guidelines and their introduction

into use in the technical support centre. Personnel participating in the management of severe accident was trained and the SAMG guidelines were put into use at the end of 2013.

For NPP Mochovce a similar procedure is foreseen to be put into practice by 2015.

Capability to manage severe accident in case of simultaneous core melt/fuel damage in different units of the same site (multi unit event)

The concept of accident management is currently based on the assumption of a severe accident only at one Unit, in compliance with the existing legislation and recommendations. The ability to respond to severe accident on both units, however, is affected only in certain areas and only in quantitative terms. Detailed analysis of increased need for additional staff and water sources are analyzed in the technical reports from the stress tests in individual power plants. The installed modifications (pumps, pipes, valves) provide sufficient capacity to cope with the situation.

For determination of safety margins in nuclear units a systematic approach called Configuration Matrix Method was developed. The approach is based on verification of performance of the fundamental safety functions for occurrence of events during operation at power as well as during shutdown modes, taking into account both fuel in the reactor as well as in the spent fuel pools. The approach identifies all feasible configurations of plant systems, both safety and operational, capable of maintaining safety functions with consideration of all possible connections available according to the design as well as those that can be set-up by personnel under given conditions in available period of time. The approach verifies presence of all conditions for functioning of the systems (i. e. power supply, working medium, instrumentation, environmental conditions, accessibility by operators, availability of procedures) and assesses how eventually these systems will be disabled in their turn with increasing load induced by the external hazards. The evaluation includes consideration of the human factor, logistic and administrative provisions for staff response in case of events initiated by unlikely extreme external conditions. All relevant information was arranged in a special database containing approximately 2,500 structures, systems and components, which will remain available for future plant safety assessments. The Configuration Matrix Method was subsequently adopted by the IAEA as one of the approaches for IAEA independent reviews.

4.3.2 Safety assessment of MSVP

Interim Spent Fuel Storage - MSVP

Description of Used Technology

MSVP represents a nuclear installation serving to temporarily and safely store spent nuclear fuel from WWER reactors prior to its further processing in a re-processing plant, or prior to its final disposal in a repository. *It is designed as a wet storage*. It was commissioned in 1986. Its active operation began in 1987.

Spent fuel is transported to MSVP after cca 3,6-year cooling in the at the reactor storage pools.

Programs of MSVP safety improvement

During the period 1997 to 1999 the Interim Spent Fuel Storage underwent an extensive reconstruction aimed at increasing its storage capacity, life extension and seismic reinforcement. The overall storage capacity of MSVP after reconstruction and seismic reinforcement has nearly tripled compared to its original capacity. Increasing its original capacity was allowed by replacing the original magazines of T-12 type with the KZ-48 type magazines and change in the geometry of storage of magazines. The storage capacity of 14,112 pcs of SNF after the reconstruction will not be sufficient for storage of all spent nuclear fuel produced during the operation of NPP V-1 Units (finished production of SNF) NPP V-2 and NPP Mochovce. Due to this reason Slovakia is currently working on preparatory works to build new capacity for storage of SNF.

The details of this program are contained in the National Report of SR elaborated in accordance with the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (www.ujd.gov.sk).

Conducted MSVP Safety Reviews

Internal safety reviews (within Slovakia) were performed during the construction and commissioning of MSVP and during its operation, by assessing and approving of safety-related documentation by regulatory authorities and SR organizations (safety reports, quality assurance programs, limits and conditions). Reports on MSVP operation, monitoring program results and overall conditions of MSVP are submitted to ÚJD SR on annual basis. No international safety reviews of MSVP have been conducted so far.

After 9 years of MSVP operation, a safety assessment report was prepared serving the purpose of decision-making with respect to extension of storage capacity.

Updated Pre-Operational Safety Report was drafted in 2000 in connection with MSVP reconstruction, which evaluated the actual safety status of the facility. The format of the safety report was based on recommendations of the US NRC Guide No. 3.44 Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation (Water - Basin Type), and ÚJD SR requirements resulted from Section 72 CFR Title 10 USA and the documents of the IAEA safety series No-s. 116, 117 and 118.

According to Section 23 par. (2) Act No. 541/2004 – Nuclear Safety and ÚJD SR Decree No. 33/2012 Coll. the company JAVYS inc. performed the periodic nuclear safety review of the Interim Spent Fuel Storage to the base term Nov. 30, 2008. Based on the results update of Pre-Operational Safety Report of this nuclear facility was performed in compliance with ÚJD SR Decree No. 33/2012 Coll. The updated Pre-Operational Safety Report was approved by ÚJD SR Decision No.158/2010. The results of periodic safety review confirmed that no important deficiencies were revealed and that conditions are established to assure nuclear safety during the operation of the Interim Spent Fuel Storage in the following ten years as well.

After updating the Pre-Operational Safety Report of the Interim Spent Fuel Storage, after the Periodic Nuclear Safety Review ÚJD SR issued its decision No. 444/2010 permitting the operation of the Interim Spent Fuel Storage *(Note: The last amendment to the Atomic Act repealed the time limitation for validity of operating license for nuclear installations and are deemed as licenses without time limitation).*

4.3.3 Accident analyses of MSVP

Stress Tests of MSVP

In July 2011 UJD requested JAVYS to prepare similar analysis as for the NPPs also for the MSVP. Following events have been considered:

1. earthquake stronger than envisaged in the project,
2. extensive flooding as contemplated in the project,
3. other external environmental conditions that could be the Bohunice site for induced loss of safety functions,
4. extended time of complete loss of own electrical power consumption,
5. extended period of incapacity of residual heat removal,
6. degradation in terms of cooling the spent fuel storage pools.

In 2012 JAVYS realized the project „Reassessment of response of MSVP response to the Fukushima type event". After evaluation of results ÚJD SR confirmed, that all goals were met. Chapter "Seismic event" has been added to the operating document "Addressing failure conditions in MSVP". The evaluation of this program have shown that:

1. the implementation of safety functions is ensured for MSVP for spent fuel storage initiating events referred above,
2. MSVP after realization of seismic upgrading and expansion of spent fuel storage capacity has increased its nuclear safety and reliably meet all safety requirements in accordance with current legislation and using knowledge and measures to analysis the impact of events on the MSVP project referred above.
3. MSVP is operated by qualified personnel and the implementation of safety culture meets the requirements for nuclear safety.

In June 2012 the program success criteria have been met.
The employees of NI JAVYS, a. s., were re-trained from corrective actions implemented in the program.

4.3.4 Emergency preparedness

4.3.4.1 Legislation in the field of Emergency Preparedness

To the basic legal regulations belong laws in the area of crisis management and partially emergency planning.

- Constitutional Act No. 227/2002 Coll. on State Security at Wartime, State of War, State of Crisis and State of Emergency, as amended, which concerns, inter alia, management of situations relating to terrorist and violent criminal acts,
- Act of the NC SR No. 42/1994 Coll. on Civil Protection of the Public, as amended,
- Act No. 387/2002 Z. z. State administration in crisis situations except wartime, state of war as amended,
- Act No. 129/2002 Coll. on the Integrated Rescue System, as amended,
- Act No. 261/2002 Coll. on Prevention of Major Industry Accidents, as amended.
- Act No. 45/2011 Coll. on critical infrastructure,
- Act No. 179/2011 Coll. on economic mobilization and on changes and amendments to the Act No. 387/2002 Coll. on management of state in crisis situations outside time of war and hostilities, as amended,
- Act No. 541/2004 Coll. on peaceful use of nuclear energy (the Atomic Act) and on amendments and supplements to some laws, as amended,
- Act No. 355/2007 Coll. l. on the protection, promotion and development of public health and on amendments and supplements to some laws, as amended.

All of the aforesaid documents take into consideration in regard of emergency preparedness the relevant European Union directives and the Vienna-based International Atomic Energy Agency recommendations.

4.3.4.2 National Organization on Emergency Preparedness

The Act No. 387/2002 Coll. establishes the scope of powers of the public authorities in managing the state in crisis situations outside time of war and hostilities, the rights and obligations of legal entities and of individuals in preparing for emergencies outside time of war and hostilities, and in resolution of these, and sanctions for breach of obligations established by this Act.

Crisis management bodies are: Government of the Slovak Republic; the Security Council of the Slovak Republic; ministries and other central government authorities; the National Bank of Slovakia; security council of the region, district office; security council of the district; municipality.

The Government of the Slovak Republic, as the supreme authority of crisis management, in compliance with the Act No. 378/2002 Coll. establishes a Central Crisis Staff as its executive body that coordinates the activity of government bodies, local government bodies and of other components designed to resolve a crisis situation during a crisis period, i.e. during resolution of an incident or an accident of a nuclear installation or during transport of nuclear material (but does not have a preventive function).

The chairman of the Central Crisis Staff is the Minister of Interior of the Slovak Republic.

To ensure necessary measures to cope with a nuclear installation emergency and measures to protect the public and the economy in an occurrence of event with environmental impacts, the National Emergency Preparedness Organization is structured into three levels as follows:

The first level is formed by emergency committees of nuclear facilities with the prime function made of management of works and measures at nuclear installation sites so as to enable identification of the technological equipment conditions, and the management of measures to cope with emergency and to mitigate the consequences on personnel, plant, environment, and population.

Another function of this level is the informative function for activities of state administration bodies on the level of local state administration, which will provide for information concerning the equipment conditions and the possible impacts on surrounding.

The second level is organized on the regional level and consists of crisis staffs as crisis management bodies of the local government, the territory of which falls into an area at risk, in which there may be threat to life, health or property, and where measures are planned to protect the population. This area is defined by the boundaries of the plant of NI JAVYS Jaslovské Bohunice, 21 km around NI V-2 Jaslovské Bohunice and by radius of 20 km around NPP Mochovce.

The third level is a national level, the Central Crisis Staff of the Government of the Slovak Republic with its supporting units (e. g.: Emergency Response Center of ÚJD SR, Center of Radiation Monitoring Network – ÚRMS, Central Monitoring and Control Centre - CMRS). Their task is to address an emergency, if the scope of an extraordinary event exceeds the territory of the region.

A part of this level are Emergency commissions of operator of nuclear installation, which closely cooperate with ERC of ÚJD SR, but also with local state administration. The main task of Emergency commission is mainly to organize and coordinate quick liquidation of major and emergency events in corresponding production and distribution facilities.

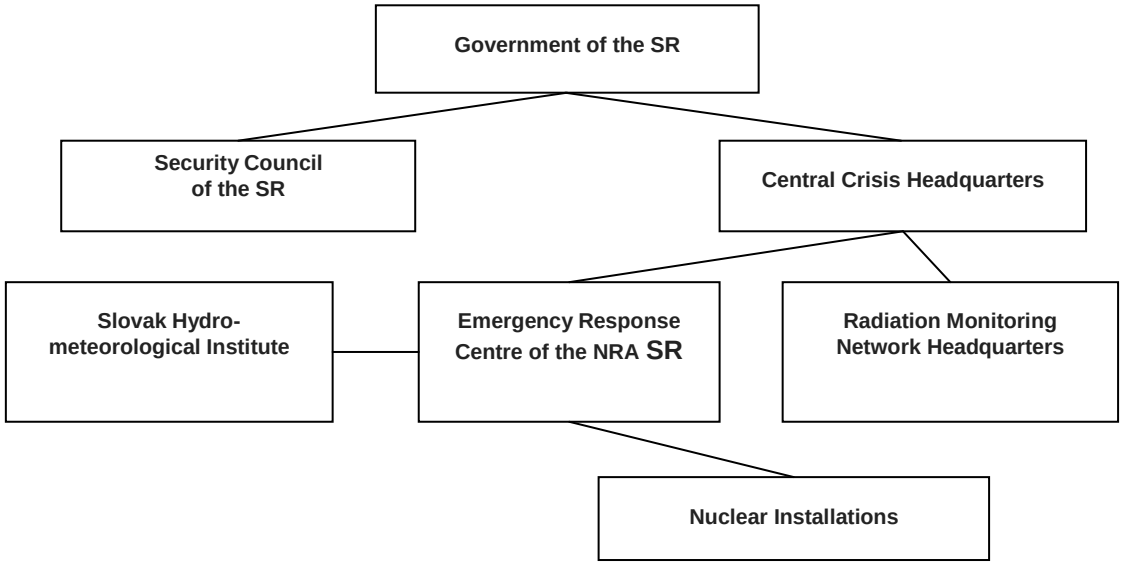


Fig. National Emergency Response Organization

4.3.4.3 Emergency Preparedness Maintenance Systems

The Bohunice a Mochovce personnel are classified into four categories by the scope of emergency training:

Category I - personnel with a short-term stay at NI (visits, excursions, etc.),

Category II - personnel permanently working at NI,

Category III - personnel involved in ERC,

Category IV - mayors of municipalities and cities in the emergency planning zone.

The training includes two parts:

- theoretical training,
- hands-on training.

The power plant personnel emergency training is conducted according to the respective categories in the form of a presentation, explanation, group seminars, practical demonstrations and hands-on training sessions - drills. Emergency training of shift personnel constitutes a separate part of the training. In both sites of licensees (SE, a. s. and JAVYS, a. s.) shift drills are performed twice a year, site-wide emergency drills with all site personnel involved are held annually and a collaboration emergency drill laid on in concurrence with local state administration and self-governing authorities, ÚJD SR ERC, and other ERC units, as appropriate (fire brigades, heath care, army, etc.), is undertaken on a three-year basis. The last interoperation exercise with the participation of ERC ÚJD SR, the local government authorities was held in October 2012 under the name HAVRAN 2012. This exercise involved all bodies of crisis management at all levels of emergency preparedness of Slovakia. The exercise involved also: CCS, all the

ministries, ÚJD SR, district offices and municipalities in the area under threat of NPP Bohunice and NPP Mochovce and also selected district offices and municipalities outside the area under threat at NPP Bohunice site. The exercise simulated an event that required protective measures for the staff of the operator and for the residents in its vicinity. From the technical and organizational aspect the exercise was prepared by the emergency planning group of NPP Bohunice.

Each drill is attended by observers and jury who upon completion of the drills evaluate their course and measures are taken to improve activities of the respective ERC units based on their conclusions. These measures are subsequently reviewed and the plant management and Authority inspectors deal with their implementation.

Experts from neighbouring countries were invited to take part.

The purpose of this exercise was to practice activities, collaboration and communication among crisis management bodies and units of Integrated Rescue System (IRS) when responding to a simulated radiological emergency. A big benefit of this exercise was the fact that it was practicing the flow of information in case of a radiation accident, it proved measures to protect the public and it practiced the collaboration of crisis management bodies and their executive bodies – the crisis staff at all levels of management.

The positive aspect was the involvement of crisis staffs in hospitals.

The exercise pointed to the lack of technical resources of intervening IRS units to effectively address emergencies associated with the release of radioactive substances. It highlighted the need to equip the selected Fire and Rescue Services and the Police Corps with special clothing to protect the body and respiratory tract, personal dosimeters and resources to carry out decontamination of people and equipment. It also identified the need to purchase screening equipment to measure the concentrations of hazardous substances. Also hospitals need to be equipped with personal protective equipment and personal dosimetry. The proposed measures also include institutional, personnel and technical upgrade of the radiation monitoring network, or training in crisis and internal communication of members of crisis staffs.

Emergency Preparedness Equipment and Resources

They are made up of the following components:

- Backup Emergency Center (BEC) serves as an alternative workplace for the emergency commission in the event of extremely adverse radiation situation *or adverse weather condition*. It is located at the off-site dosimeter premises in the Bohunice (Trnava) and Mochovce (Levice) sites.
- Civil protection shelters are used as the primary shelter for shift and intervention personnel and serve for handout of individual protection means and special kit for intervention units.

- Civil protection assembly points serve for personnel (not included in OHO) and other persons staying in the NI territory.Thanks to their equipment they create conditions fore a short-term stay of personnel while using individual protection means.
- In-house Medical Centre (IHMC) is intended for basic medical provision, giving pre-medical and medical aid and preparation for transfer of those afflicted to specialized health care facilities. Also part of IHMC is a decontamination point and workplaces to measure individual internal contamination.
- On-site communication facilities and equipment:
  a) Slovak Telecom´s public telephone network,
  b) power telephone network,
  c) mobile telephone sets,
  d) Motorola special-purpose radio network,
  e) Multitone paging network,
  f) in-house radio and operational (unit) radios.

Fig. New bunkered emergency center at Jaslovské Bohunice

Post-accident Management

In accordance with legal framework the licensee notifies the central government authorities already at the first level – alert/emergency. Then informs the central government authorities, among them also ÚJD SR on the developments. On the first level it starts the warning system in

the vulnerable objects of NI. On the second level it starts the warning system on the wholeterritory of a NI. On the third level it triggers the warning system and notification system in vulnerable sectors in the area at risk around the NI.

State administration authorities in the emergency planning zone have their own emergency plans. According to these plans, authorities take following measures for public protection:

Period (Phase)	**Measures**
Threat/ Emergency	Notification of emergency staff (Emergency response organization) and preparation for public notification.
	Preparation for taking urgent measures in emergency planning zone in early phase of the accident.
	Notification of public about measurement taken during emergency phase.
Early Phase	Warning of emergency staff (Emergency response organization) and also public warning.
	Monitoring of radiological situation.
	Access regulation (persons and vehicles).
	Sheltering.
	Iodine prophylaxis.
	Evacuation.
	Use of individual protection means and special individual protection means.
	Partial sanitary cleaning of persons and objects.
	Ban of non-protected food, water and feed consumption.
Intermediate and Late Phase	Control of persons and vehicles movement.
	Control of consumption of food, water and feed contaminated by radioactivity.
	Relocation of population according to the evaluation of current radiation situation and prognosis of its development.
	Deactivation of impacted area.

ÚJD SR together with the group of specialists from the Ministry of Interior, Ministry of Health, Ministry of Environment – the Slovak Hydrometeorology Institute, Ministry of Defense, Ministry of Health, district offices of Trnava and Nitra municipalities and State administration authorities of the emergency planning zone has the following handbooks:

1. Handbook for management of contaminated populated areas.
2. Handbook for management of taken measurements after the change of event status.
3. Handbook for management of drinking water after contamination.
4. Handbook for management of contaminated populated areas after the event.

These Handbooks are prepared especially for Slovakia and include rehabilitation/recovery of contaminated territories during the late phase of an accident at NPP.

Individual procedures concerning introduction of emergency management provisions targeted to mitigation of radiation accident consequences, factors affecting realization of these measures, establishment of recovery strategy, calculations of cost necessary for forces and means as well as economic, politic and social impact on society are elaborated in these handbooks.

4.4 Management System

A condition for issuing license by ÚJD SR requires the following:

1. The Operator's management shall take the relevant steps in order that all the organization units involved in activities directly relating to nuclear installations comply with the policy attributing due priority to nuclear safety;
2. To respect division of competencies so that the primary responsibility for safety of nuclear installation is with the licensee;
3. Coordination of tasks of nuclear safety by an independent unit for nuclear safety within the organization structure of the licensee. The scope of activities of this unit shall be submitted to ÚJD SR. ÚJD SR must be informed about appointment of the head of this unit, as well as on changes in their scope of activity at least one month prior to such changes or appointment taking effect.

In the area of meeting the requirement of professional competence, the Atomic Act includes the obligation of the applicant to demonstrate sufficient number of permanent staff with the required qualification. The necessary number of permanent staff and their required qualification is determined by the licensee himself, and that is in the quality system documentation, which is approved by ÚJD SR.

Act No. 541/2004 Coll. imposes the following:

A special condition for issuing license or permit for construction of a nuclear installation, its commissioning, operation, decommissioning, management of nuclear materials and other activities specified in the law, is approval of documentation of the quality management system for the licensed activity.

The licensee is required to establish, document, introduce, maintain and review a quality management system and to provide for financial, technical and human resources to create and maintain a quality management system.

ÚJD SR Decree No. 431/2011 Coll. governs the requirements for quality management system of the licensee. *Further it regulates the* requirements for the quality system *documentation,* quality assurance of nuclear installations and quality assurance of the qualified equipment.

Requirements defined in the annexes to the ÚJD SR Decree No. 431/2011 Coll. apply for quality management system and the quality management system documentation of licensees.

Requirements for quality assurance of nuclear installations are contained in the quality assurance programs, the content of which is defined in Annex 4 to theÚJD SR Decree No. 431/2011 Coll. and is structured as follows:

- Preliminary program of quality assurance for nuclear installations, which includes the basic requirements for quality assurance for all phases of nuclear installation life;
- Phase program of quality assurance for nuclear installations, which includes the requirements for quality assurance always only for a specific phase of nuclear installations life (from the design phase until decommissioning).

Requirements for quality assurance of qualified equipment are specified in the quality plans of the qualified equipment, the content of which is defined in Annex 5 to the ÚJD SR Decree No. 431/2011 Coll.

Quality management systems of licensees are developed and introduced in a form of Integrated management system (hereinafter only as the IMS). It is a management system that meets the requirements for the safety management, quality and protection of the environment, in accordance with the IAEA recommendations No. GS-R-3 *and the IAEA No. GS-G-3.1.*

History of quality systems development

Currently there are two organizations operating nuclear installations in Slovakia - SE, a. s. and JAVYS, a. s. Development of their quality systems is a continuous process, which until year 2006 was a common one within SE, a. s., therefore the initial and the current status in both organizations is similar and is described jointly.

Currently the quality management systems of the licensee under the Atomic Act No. 541/2004 Coll. are based on:

- National legal framework;
- Standards and guidelines;
- ISO 9001; ISO 14001, OHSAS 18001, ISO/IEC 20000-1 and ISO/IEC 27001;
- Internal needs of the company in building an effective management system.

Policies declared and implemented by the NPP operators

The overall intents and direction in the field of quality, environmental protection, safety (occupational health and safety, nuclear safety, radiation protection), corporate security (crisis management, including emergency preparedness and planningand general security) and human resource management are set out in the Integrated Corporate Policy.

The Integrated Corporate Policy takes into account the requirements of the international standards, national legal framework and the recommendations of international organizations (for example, the IAEA, GS-R-3, GS-G-3.1).

In order to fulfil the Integrated Corporate Policy there are company objectives set for the individual years (Key objectives for the year ....).

The key objectives for the relevant year are proposed by the managers responsible for individual processes and are approved by the company management.

The key objectives for the relevant year are broken down to individual plants by the plant managements.

Objectives are defined so as to be:

- With deadlines, measurable, and so that they can be evaluated,
- Reasonably achievable,
- Comprehensible,
- Usable and appealing to the company,
- Economically justifiable.

The basic tool for fulfilment of the Integrated Policy and objectives is maintenance and improvement of the Integrated Management System (IMS).

The top management of the company creates conditions and prerequisites for the implementation, maintenance and improvement of IMS by defining an Integrated corporate policy, providing the necessary resources (human resources and organizational infrastructure, technology, technical, financial resources, etc.), appoints the representatives of the management - for IMS, or for the individual management systems - quality, safety, environment at plants, conducts review of IMS at specified intervals to ensure its continuous suitability, adequacy and effectiveness.

The main principles of IMS are the following:

- Each employee is responsible for the quality of his/her work,
- All activities having impact on the quality, are performed in compliance with the applicable regulations,
- IMS builds on good practice in the management system, as well as the best domestic and international experience,
- The management is responsible for development, introduction, continuous monitoring and evaluation of the efficiency and for further development of IMS, including staff training,
- IMS is built as a single management system that includes all the activities undertaken and the processes, relevant to the achievement of organizational goals.

All activities within the identified IMS processes are managed so as to minimize the negative impacts on the environment, the health and safety of the population and to comply with the applicable laws, permits and decisions issued by the competent authorities of state regulation.

Developing Integrated Management System on the basis of Quality Management System

IMS is based on a process approach, there are sponsors and process owners, the processes are organized hierarchically and are divided into three groups (control, main, support groups) with identified processes relevant to nuclear safety.

Currently, for example the IMS at SE, a. s., is certified according to ISO 9001; ISO 14001; OHSAS 18001 standards. In 2013 a re-certification audit is scheduled, which will be undertaken by an independent accredited certification company. The findings from the re-certification audit will become the basis for continuous improvement of the IMS.

Verification of the Integrated Management System efficiency

Efficiency of the integrated management system, including the quality system is verified through:

- internal audits conducted within the integrated management system,
- certification and supervisory audits by external accredited certification companies,
- inspections conducted by ÚJD SR and controls performed by other regulatory authorities.

Findings from audits, inspections or controls are consistently and thoroughly analyzed on the relevant levels. Based on the analyses, effective and efficient corrective and preventive measures are taken, the implementation of which is regularly checked. Results are submitted for discussion to the company management. The findings are an important source for continuous improvement of the integrated management system.

Quality Management System Audits at Suppliers

The licensees carry out audits of quality management systems of selected suppliers affecting nuclear safety of nuclear installations, checking upon the effective application of the requirements of quality management systems according to the ISO 9001 standard and specific nuclear requirements. The requirements for suppliers are passed on through the contracts, including the General Business Terms and Conditions or Safety-related technical conditions, which are attached to the contracts. The purpose of these audits is to ensure quality and reliable suppliers for a safe, reliable, ecological and efficient power generation.

Management and Operational Documentation for Operation, Maintenance, Testing

Operation, maintenance, reviews of systems and procedures for transient and emergency conditions of nuclear installations are carried out according to the management and operational documentation, which is required by the Act No. 541/2004 Coll. *and its implementing regulations*.

Documentation management is part of quality management system of the licensee which is part of the integrated management system. Documentation of the quality management system including the operational documentation complies with the requirements of the Act No. 541/2004 Coll. on peaceful use of nuclear energy (the Atomic Act), implementing ÚJD SR Decree No. 431/2011 Coll., the international standardSTN EN ISO 9001:2008 utilizing the IAEA recommendations, in particular GS-R-3 and GS-G-3.1.

Specialized departments are constituted at the respective power plants for management of operationaldocumentation. Its main tasks include:

- maintain a uniform operational documentation system including a uniform system of operational documentation identification, rules for work with operational documentation and a uniform system of operational documentation registration,
- organize approval of operational documentation,
- issue, distribute and update operational documentation as required by departments,
- conduct periodic review for up-to-datedness of operational documentation at three-year intervals,
- provide approval and issue of revisions and changes of operational documentation and distribution thereof in an established procedure,
- keep the original of operational documentation with originals of signatures in hard-copy, keep the original of operational documentation in e-format,
- keep and update the distribution list of controlled operational documentation,
- notify of issue of new and repealing of invalid documents,
- keep and store the history of operational documentation,
- keep and make accessible applicable operational documentation and information thereon to users in e-format,
- disposal of invalid documents.

Described below are the following basic types of documentation in use:

- Operational documentation;
- Documentation on equipment verification and testing;
- Maintenance technologic processes.

Operational Documentation

This is a set of documents developed to set forth the method of organization, management and control of operation, the mode of technologic equipment operation under nominal steady and transient conditions, as well as under abnormal and emergency conditions. It also defines procedures for the performance of certain activities directly related to operation, equipment quality documentation, determination of operating personnel job responsibilities, lists of documentation at the shift service point, assurance of fire protection of operational workplaces, and for documenting the course of operation and related issues.

Operational documentation contains:

Standardising documentation which defines basic organizational and technical requirements for reliable, economic and safe operation of the nuclear power plant.

Organizational and operational documentation which deals with the organization of operation and operation of the units proper under nominal and non-nominal conditions. It consists, e. g., of:

- Operating regulations;
- Technologic regulations for abnormal operation;
- Symptom-oriented regulations for emergency conditions – PHP;
- Other operational documentation;
- Fire guidelines for workplaces.

Role of regulatory authorities

The activity and the tasks of ÚJD SR in the field of quality assurance, is established by the Act No. 541/2004 Coll. (Atomic Act), ÚJD SR Decree No. 431/2011 Coll. on the quality management system and by ÚJD SR Decree No. 430/2011 Coll. on the requirements for nuclear safety.ÚJD SR Decree No. 430/2011 Coll. specifies the details of the requirements for nuclear safety of nuclear installations during their siting, design, construction, commissioning, operation, decommissioning and when closing a repository, as well as criteria for categorization of classified equipment into safety classes. Requirements for classification of classified equipment of nuclear installations into safety classes from I to IV are divided according to the type of safety function, which they provide. ÚJD SR Decree No. 430/2011 Coll. at the same time sets the requirements for the form and content of the lists of classified equipment approved by the Authority.

In exercising state regulation in the field of quality assurance ÚJD SR concentrates on four basic activities:

- Review and approval of quality management system documentation.
- Review and approval of requirements for quality and requirements for quality assurance.
- Review and approval of changes in the quality management system.
- Inspections of the quality management system and fulfilment of requirements specified in the quality management system documentation of the licensee.

During inspections in the field of quality assurance, the ÚJD SR inspectors check on how the operators, according to the Atomic Act and Decree No. 431/2011 Coll. and the conditions set out in the Decisions issued by the ÚJD SR, and how do they comply with the approved documentation of the quality management system and the requirements for quality. The inspection activity of the inspectors, upon approval of the relevant document, focuses on checking fulfilment of its individual requirements and practical implementation of requirements, i.e. observance of the approved documented procedures and actual activities. The inspector prepares a record or protocol on the inspection and discusses it with the responsible organization.

In case of any deficiencies identified on the selected equipment, in activities or the documentation the inspector is authorized to impose measures for their removal. Inspections are carried out according to the approved program; they have their objective and a specified form of their documenting.

Labour inspection from the Labour Inspectorate Nitra focusing on the Quality Assurance Systems from the point of occupational health and safety consist of control of legal entities and natural persons performing certain activities (production, installation, repairs, reconstruction, inspections, tests, revisions, maintenance, import of equipment, ...) on equipment being subject to labour inspection. During verification of competence the Quality Assurance System is also subjected to it, respectively the documentation, records, physical state of the technical equipment of legal entities and natural persons.

4.5 Human and Financial Resources

4.5.1 Financial resources

The Act No. 541/2004 Coll. (Atomic Act) provides for: to maintain financial resources and human resources for ensuring nuclear safety, including appropriate working conditions and the necessary engineering and technical support in all areas relating to nuclear safety.
In addition ÚJD SR Decree No. 431/2011 Coll. on quality management system requires that the quality management system should contain provisions for the availability of financial, material, technical, human, etc. resources.

Financing of operations and of safety improvement programs

One of the principles of nuclear and radiation safety of operators is the commitment by the operators to spend the necessary financial resources to meet the requirements of nuclear and radiation safety and for providing for continuous improvement in education and qualification of staff. In order for the licensees to be able to fulfil this commitment, financial strategies of companies have been established, which in addition to the already mentioned tasks would allow fulfilment of development program for the production and technology basis and the HR policy or training policy for their staff.

Financial strategy of operators is defined as securing financing of operational and investment needs of the company with optimal utilization of own and external resources.

Financial resources for the decommissioning programs of NI and RAW treatment

The Act No. 238/2006 Coll. on the National Nuclear Fund for Decommissioning of nuclear installations and for the management of spent nuclear fuel and radioactive waste (Act on Nuclear Fund) establishes the rules for management, contributions and use of the Fund. The basic source of the Fund are mandatory contributions from the licensees for operation of nuclear installations generating electricity, for every megawatt of installed capacity and from the selling price of electricity produced at the nuclear installation.

The purpose of the National Nuclear Fund (hereinafter only as the Fund) is to collect and manage financial resources determined for the back end of nuclear energy in sufficient level and in a transparent and non-discriminatory manner to provide these funds to the applicants to cover eligible costs incurred for activities related to the back-end of nuclear energy.

Another source of financing for decommissioning of NPP V-1 is the Bohunice International Decommissioning Support Fund (BIDSF), which was established on the basis of Framework Agreement concluded between the Government of the Slovak Republic and the European Bank for Reconstruction and Development.

4.5.2 Human resources

High quality of human resources is the basic prerequisite for safe, reliable, economical and ecological operation of nuclear installations. The term “high quality human resources“ means a summary of professional, health and mental capacity of employees for performance of work activity with licensees. From the view of influence of work activities on nuclear safety the staff of the licensee are divided into two basic groups:

- Employees having direct impact on nuclear safety – selected employees, whose special professional competence is verified by an exam (written exam, oral exam and verification of competencies on a representative full-scale simulator) and a practical exam before an examination committee for selected employees, which is established by ÚJD SR, which issues License of Special Professional Competence;
- Employees having impact on nuclear safety – professionally competent employees, whose professional competence was verified by an expert committee established by the operator of a specialized facility in a form of written and oral exams and which issues a Certificate of Professional Competency. Depending on the nature of works they are divided to daily and shift professionally competent employees.

Special professional competence of employees according to Atomic Act means a summary of expertise, practical experience, principal attitudes and knowledge of generally binding legal regulations and operating procedures issued by the licensee for ensuring nuclear safety, which is necessary for performing work activities having direct impact on nuclear safety.

Professional competence means summary of expertise, practical experience, knowledge of generally binding legal regulations and operating procedures issued by the licensee and necessary for performing work activities of licensee´ employee. Professional competence is acquired by successful completion of training at a specialized facility.

The licensee is responsible for the capability of his employees to perform work activities at nuclear installations. For every selected and professionally competent employee a “License to perform work activities” is issued as part of integrated management system (IMS) of quality assurance for nuclear installation – licensee. License to perform work activities is issued for the given job position and a specific nuclear installation only for those selected and professionally

qualified staff of the licensee, who hold valid certificates of special competence or certificates of professional competence *and completed the relevant type of training.*

Organizational structure and adequacy of human resources

The Atomic Act in § 25 para (5) provides that the licensee shall provide financial, technical and human resources to develop and maintain the quality management system, while these resources must be in accordance with the resources for securing nuclear safety.

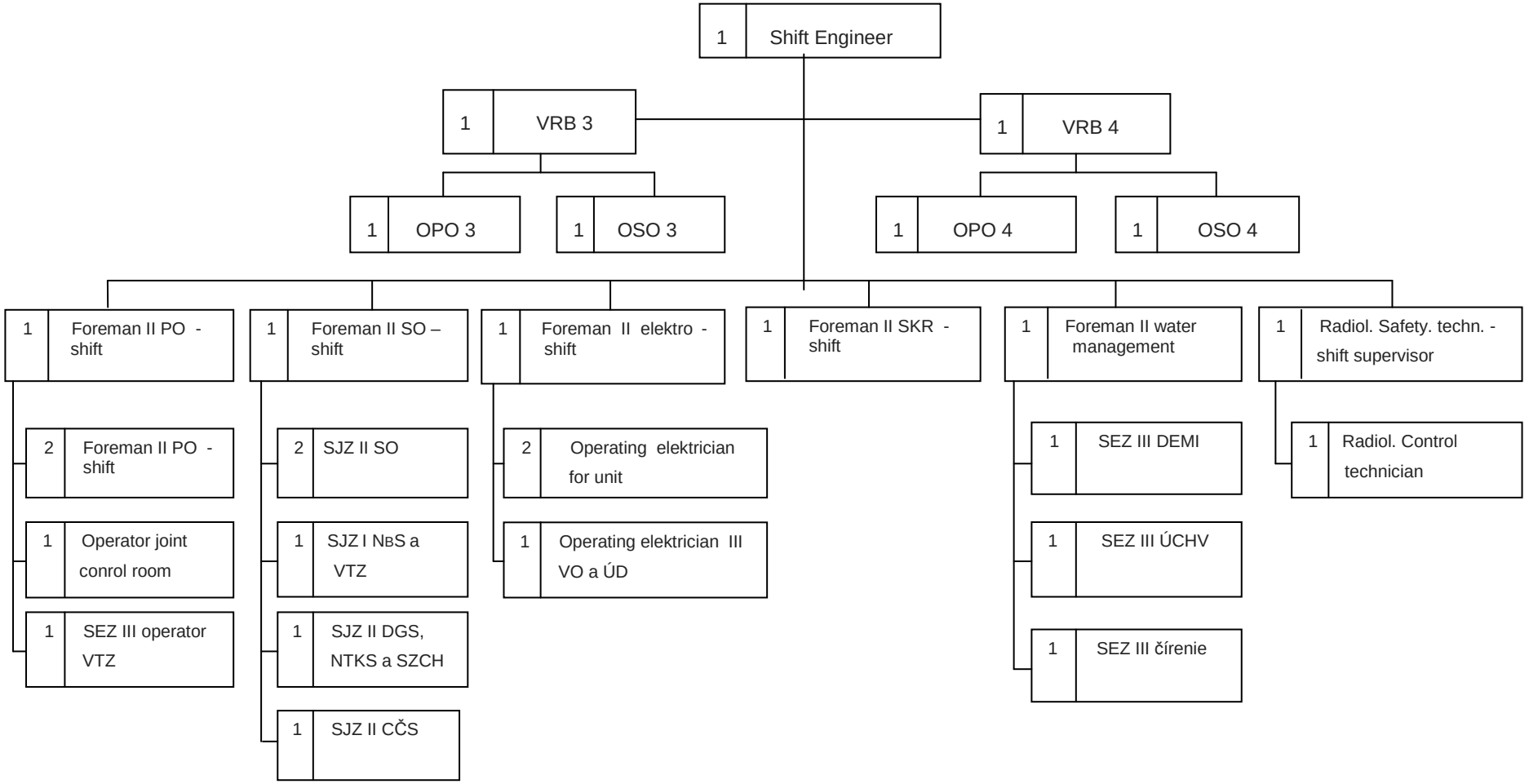
ÚJD SR Decree No. 431/2011 Coll. on quality management system § 4 determines that quality management documentation of the licensee shall contain (inter alia) the organisational structure and its description. § 9 of the same decree determines, that any changes to the documentation shall be justified, carefully planned and after their implementation evaluated. The quality management system and its changes are subject to approval by ÚJD SR.

As regard the number of staff at the nuclear installation the Atomic Act § 7 a license is the approval of limits and conditions (L&C) for the safe operation.

ÚJD SR Decree No. 58/2006 Coll. on the scope, content and method of preparation of nuclear installation documentation requires that the L&C for the safe operation of a nuclear installation determines the minimum number of employees during a shift and their assignment (responsibilities).

Example for a NI:

MINIMUM SHIFT OCCUPANCY NPP V-2



5 Expertise and skills in nuclear safety

Article 7

Member States shall ensure that the national framework in place requires arrangements for education and training to be made by all parties, for their staff having responsibilities relating to the nuclear safety of nuclear installation in order to maintain and to further develop expertise and skills in nuclear safety.

5.1 Licence holders

In the system of professional training each position has defined requirements for education, experience, training, health and mental capacity. The direct supervisor of the employee is responsible for meeting these requirements.

Within system of professional training of employees of the licensee is updated on the basis of operational experience, implemented organizational changes, technical solutions (modernization) carried out on the equipment, and requirements of regulatory bodies, audits, reviews and recommendations internal and external organizations (interných a externých organizácií), for example the IAEA, WANO. This is provided for by necessary human, financial and material resources.

Professional training of staff of the licensee, as well as for the third parties (the third parties are contractor organizations) is carried out in compliance with the documentation *Integrated Management System,* developed and maintained in accordance with:

- Generally binding legal regulations;
- The IAEA, WANO, INPO standards and guides;
- STN EN ISO 9001:2001 and 14001:2004 standards;
- Management documentation of the Quality System.

Management documentation contains following items:

- Selection and assignment of employees to positions;
- Definition of training objectives,
- Description of methodology used for training, based on systemic approach,
- Development of employees;
- Acquisition and maintenance of general competencies of contractor staff;
- Description of the training documentation management and training records,
- Division and definition of competencies and responsibilities of staff in relation to their training.

Chart of the system of professional training of staff

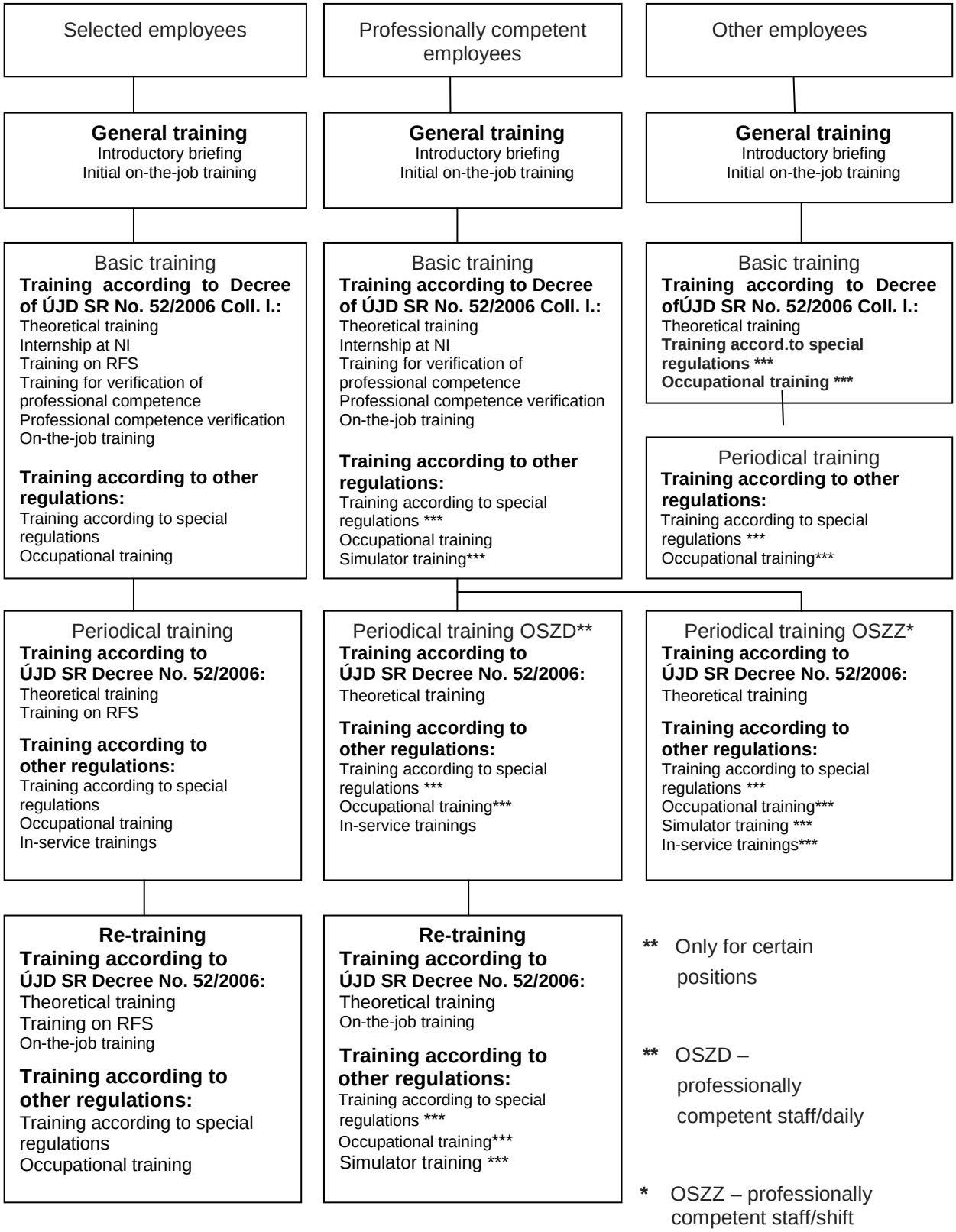


Fig. Chart of Professional training system for employees

With respect to impacts on nuclear safety the employees are assigned to the relevant type and phase of professional training and they are divided according to performed work activities into six

categories, which are further sub-divided into occupational groups and sub-groups, according to their professional orientation:

Category 1 – Selected employees with an university education performing work activities having direct impact on nuclear safety (permanent crew of the control room, shift supervisor, control physicist, shift start-up engineer and senior start up supervisor).

Category 2 – Technical and administrative professionally competent staff of operation, maintenance departments and department of technical support with university education or secondary education *(managers, technicians, specialists and foremen).*

Category 3 – Operating shift and operating daily staff professionally competent, this category includes personnel performing service activities on technological equipment having impact on nuclear safety.

Category 4 – Professionally competent maintenance staff (except engineers) – employees involved in maintenance activities on the technological equipment having impact on nuclear safety.

Category 5 – Professionally competent staff in charge of decommissioning of NI and handling RAW and spent fuel, having impact on nuclear safety. *Note: Not applicable for SE, a. s., valid only for JAVYS, a. s.*

Category 6 – Other staff included for training on NI *without influence on nuclear safety.*

Facilities for staff training

The training and exercise of employees of the licensee, as well as of contractor staff is carried out at specialized facility, which is licensee for professional training issued by ÚJD SR on the basis of written application upon assessment of the technical equipment used in professional training and competence training of the applicant's staff. The training is performed in compliance with the approved system of training according to the staff training programs. The following full scope simulators are available:

- at VUJE, a. s. – in operation and Unit 3 of NPP Bohunice is a referential unit,
- at NPP Mochovce – in operation and Unit 1 of NPP Mochovce is a referential unit,
- at NPP Mochovce3&4 – under construction and Unit 3 of NPP Mochovce3&4 is a referential unit.

Simulators are constantly updated in accordance with the control room updating of the relevant NI to maintain its representative and full scope ability for adequate training. Major upgrades were completed on RFSS (representative full-scope simulator) of NI EMO in 2013, during which was replaced the control computer and the core model as well as to eliminated inconsistencies with the relevant block which have been found during the trainings last 10 years. Similar modernization was successfully implement and in May of this year completed also at RFSS NI EBO at VUJE, a. s.

5.2 Regulatory authority

ÚJD SR approves and evaluates the annual training program for its employees. In addition, ÚJD SR has a training software at its disposal, LMS i-Tutor, which includes a training and testing module according to the demands and requirements for training. The system is on the office server and each employee has its own access code. Employees can thus deepen their knowledge of general overview (legislation, international relations, etc.) as well as their own specialization (operation, decommissioning, radioactive waste management, emergency planning, etc.). This is a form of e-learning (Computer Based Training) for employees as self-study.

Contracts and activities to promote the exercise of regulatory activities

ÚJD SR caters for professional advice and services or exchanges knowledge, experience and information to support its regulatory activities, as needed. This includes creation of policies, strategies and plans, development in general – binding legal regulations and guides of ÚJD SR, preparation of analyses, studies and opinions, verifications, experiments, providing technical support and preparation of draft assessment reports.

To support its regulatory activities ÚJD SR uses natural and legal persons who work in the given field, have quality management system, the necessary technical and personnel resources and the conflict of interest is excluded. This includes local and foreign universities, institutions, organizations, companies and individual experts.

Cooperation with foreign partners is carried out:

a) On the basis of intergovernmental agreements on cooperation and exchange of information,
b) On the basis of international conventions,
c) On the basis of membership in international organizations,
d) On an informal basis.

External support for regulatory activities in the given year is secured by ÚJD SR on the basis of contracts.

Long-term needs of technical support for ÚJD SR are secured through tasks of science and research. Vice-chairman of the Authority is responsible for planning science and research. The tasks of science and research are assigned and solved in a medium-term (3 to 4 years). ÚJD SR also participates on solution and financing of science and research tasks solved within international cooperation and supported by the European Commission (SARNET), the Nuclear Energy Agency at the OECD (PKL3 Project) or agreed within bilateral cooperation (ÚJD SR – US NRC).

In case of important decisions related to nuclear safety ÚJD SR invites international missions (the IAEA, WENRA) for its support.

6 Information to the public

Article 8

Member States shall ensure that information in relation to the regulation of nuclear safety is made available to the workers and the general public. This obligation includes ensuring that the competent regulatory authority informs the public in the fields of its competence. Information shall be made available to the public in accordance with national legislation and international obligations, provided that this does not jeopardise other interests such as, inter alia, security, recognized in national legislation of international obligations.

The access to information is guaranteed by the Constitution and other instrumentson human rights since the early 1990´s. The Act No. 211/2000 Coll. (Freedom of Information Act) provides the citizens with a statutory way of obtaining necessary information. This Act along with Act No. 541/2004 Coll. (Atomic Act) and Act No. 24/2006 Coll. (Act on Environmental Impact Assessment) constitutes the legal framework for public relations with respect to nuclear energy. The operator shall be obliged by course of ActNo. 541/2004 Coll. (Art. 27 (4)) to notify ÚJD SR of occurrences at operated installations and, in case of an incident or an accident, pursuant to Art. 28 (3) thereof also to inform the public. Among the obligations of the licensee, according to the Atomic Act (Section 10, par. 1l) is to inform the public through its web site, press or other publicly accessible ways, always as at 30 April, also on assessment of nuclear safety of their operated installations for the past calendar year.

The operation of NI´s as well as completion of Mochovce Units 3&4 have strongly affect the life in the regions, which necessarily called forintensification of mutual communication with the NI surrounding area regions and at national level. Transparent information about all aspects of NI construction, operation and decommissioning and making the information publicly accessible via information channels have become an integral part of the operators´ and regulatory authorities´ open policy on informing and participation by the stakeholders in decision-making processes. The most important communication channels include:

- Information Centres in Mochovce and Bohunice are combined with a tour of the nuclear installations. Annual attendance exceeds 15 thousand visitors from all over the country and also abroad from all target groups, professional and the general public. Information on nuclear energy is presented also in a form of external presentations at schools and in cultural houses,
- The Monthly “atom.sk” distributed free of charge in the regions with the power plants Mochovce and Bohunice and educational printed materials (information brochures and leaflets) also in electronic format, prepared in an accessible and understandable form,
- websites of the operators – www.seas.sk, www.javys.sk,
- Mochovce and Bohunice Civil Information Commissions (hereinafter referred to as CIC) composed of elected and other representatives of the regional public. Members of CIC hold regular meetings with the management of license holders and thus they receive qualified first

hand information with the intention to be the first to be informed about the work of NI and to be able to share objective information among the citizens,.regional associations of towns and municipalities which communicate and tackle their problems in concurrence with NI operators in a given region,

- operators local sponsorship programs helpful in areas health care, education, research, environment, culture, sports – company wide project www.energiaprekrajinu.sk,
- Open Plant for personnel, their families and the public held annually at both NI´s, attendance each year exceeds 4,500 visitors.
- others: seminars for journalists (Energyhour), mayors and local-government officials;
- press releases, conferences on significant milestones and anniversaries, press releases for the media, active involvement in domestic and foreign exhibitions, conferences, etc.

ÚJD SR as the central body of state administration provides information in the field of its operation upon request on-line and at the same time it is active in publishing information on the status of nuclear installations in Slovakia and on its activity as a regulatory body (www.ujd.gov.sk), by which it allows the public and the massmedia to control the data and information on the activity of the Authority and on the nuclear installations. On the Authority's website, in addition to descriptive data there are also initiated, ongoing and completed administrative proceedings under Act of NC SR No. 71/1967 Coll. on administrative procedure as amended, as well as ÚJD SR Decisions in full, together with their substantiation.

ÚJD SR holds competencies in respect to keeping the public informed on nuclear safety matters and monitors other media sources with a view to getting the necessary overview of information policy on a given subject. ÚJD SR independently from nuclear installation operators provides information on nuclear safety of nuclear installations, including information on the management of radioactive wastes, spent nuclear fuel, nuclear materials, control andaccounting for thereof, as well as information on other fuel cycle phases.

Under the Atomic Act, ÚJD SR prepares annually a report on activities and on safety of nuclear installations in Slovakia for the past year to be submitted for discussion of the Government and of the National Council.Also a paperback Annual Report is published in Slovak-English version, which is distributed to libraries, ministries, other central government authorities, to state organizations, regional governments and municipalities at nuclear installation sites, to schools, embassies of foreign countries in the SR, embassies of the SR abroad, foreign regulatory bodies, international and other organizations.

A special emphasis is put on communication with the public in nuclear installation regions, seeks to continually improve it through co-operation with CIC´s, municipal officials and distribution of information materials such as annual reports, leaflets and contributions to the regional press and television.

ÚJD SR sends out annually to Slovak news agencies, dailies and e-media contributions on its domestic and foreign activities and organizes press conferences for journalists. Along with the

Czech State Authority for Nuclear Safety (SÚJB) are the publisher of the journal “Bezpečnosť jadrovej energetiky“ focusing on the presentation of the latest knowledge on nuclear safety in Slovakia and the Czech Republic.

District offices and municipalities, according to the Act of NC SR No. 42/1994 Coll. on the Civil Defence, are publishing information to the public on the web site or on a public notice board, while there is a 30 days period, during which the affected public can raise comments.

Justified comments shall be reasonably taken into consideration in developing the public protection plan. Information is reassessed and updated, as needed; once updated, it is published as a minimum on a three-year basis. The public information includes in particular information about the source of threat, the possible scope of an emergency and the consequences in the territory and environment affected, hazardous properties and identification of substances and preparations which might give rise to an emergency, information on the method of public warning and rescue efforts, tasks and actions in an emergency, particulars of where further information relating to the public protection plan can be obtained. State administration authorities and self-governing bodies issue manuals for the public containing advice for the public which are aimed to furnish as much as possible information on how to act and behave in natural disasters, accidents and calamities. Since 1999 the Ministry of Interior has issued the popular and educational periodical “Civilná ochrana, revue pre civilnú ochranu obyvateľstva” addressed to all who are actively involved in the performance of tasks under Act of the NC SR No. 42/1994 Coll. on public civil protection, but also to all readers interested in the public civil protection issues. The revue brings in the respective columns up-to-date information, runsmethodical supplements devoted to practical performance of civil protection tasks, etc. A separate space is devoted to local-government as well.

7 Annexes

Annex 1 BIDSF Projects Overview

Annex 2 List of ÚJD SR Decrees

Annex 3 List of Safety Guidelines

Annex 1

BIDSF Projects Overview			
Grant Agreement	**Date of GA**	**Project title**	**Project status**
GA001	9 Dec.2002	PMU Consultant (phase 1)	Project completed
GA 002	10 Dec. 2003	Križovany 400 kV reconstruction	Project completed
GA003	15 June 2004	Reliable supply of heat and steam: reconstruction of auxiliary boiler house at Bohunice site	Project completed
GA004A	4 Oct.2007	Reconstruction of physical protection system at the power plant – AKOBOJE	Project in implementation
GA005	6 Aug.2004	Conceptual decommissioning plan for NPP	Project completed
		Report on impact assessment of NPP V-1 decommissioning on the environment	Project completed
GA006	11 Jan.2005	Delivery of transport container for concentrates	Project completed
		Sampling, analysis and characterization "wet waste"	Project completed
		Sampling, analysis and characterization of Ra sediments in storage tanks	Project completed
GA007A	1 July 2009	Development of summary documentation needed for the period of completion of operation and preparation for decommissioning of NPP V-1	Project completed
GA008A	18 Dec.2007	Change in the system of heat and steam supply	Project completed
GA009C	11 March 2010	Spent fuel management	Project completed
		Documentation management system	Project completed
		Decommissioning database	Project completed
		Decommissioning database – technology upgrade	Technical specification
		Reconstruction of BSC RAO	Project completed
		Extension of RÚ RAO Mochovce (feasibility study)	Project completed
		Design and construction of new storage areas for LLW and VLLW from decommissioning of NPP V-1 in RÚ RAO Mochovce	Technical specification
GA010B	11 March 2010	Feasibility study for treatment of metal waste	Project completed
		Increasing capacity of existing fragmentation and decontamination plant	Project in implementation
		Integral RAW storage at Bohunice site	Open tender
		Release of materials from decommissioning	Project completed

		Construction of new large capacity F&D plant for NPP V-1	Project in implementation
GA 011A	4 June 2009	SLOVSEFF	Project in implementation
GA012A	11 March. 2010	Reconstruction of warning and notification system	Project completed
		Storage magazines for spent nucler fuel (SNF)	Project completed
		Plan of phase one of decommissioning of NPP V-1 and other documentation	Project completed
GA013C	14 Dec.2011	Feasibility study for change in the scheme of power supply system JAVYS and SE after shutdown of NPP V-1	Project completed
		Modification of reserve power supply for NPP V-1 and V-2 on the level of 220 kV until 2012	Project completed
		PMU Office building	Project in implementation
		Information Centre on decommissioning of NPP V-1	Project in implementation
		Treatment of historical waste - sludge and sorbents	Project in implementation
		Modification of systems of cooling and service water, and raw water system	Project completed
		Change in the scheme of power supply system for JAVYS after the final shutdown of NPP V-1	Project in implementation
		Modification in securing supplies of essential operating media	Project completed
		Optimization of the electric scheme	Development of tender documentation
GA 014	18 Dec. 2007	PMU Consultant	Project in implementation
		TR Bošáca - Transformer T402	Project in implementation
		2 x 400kV power lines for TR Medzibrod	Project in implementation
		Transformation 400/110kV Medzibrod	Project in implementation
		R 400 kV Lemešany – extension	Project completed
GA 015	20 March 2008	Energy efficiency in public buildings	Project in implementation

GA016D	17 July 2012	Modernization of monitoring of radiation protection equipment	Project completed
		Handling of bulk RAW	Project completed
		Disposal of "RH" waste from "mogilnik"	Project preparation
		Single computer system for decommissioning logistics	Development of tender documentation
		Plan for phase two of decommissioning of NPP V-1 and licensing documentation	Project in implementation
		Report on impact assessment of phase 2 of decommissioning of NPP V-1 on the environment	Project in implementation
		Decommissioning personnel for NPP V-1 – phase 1	Project in implementation
		Laboratory equipment needed for the process of decommissioning JE V-1	Project in implementation
		Modification of storage areas	Project in implementation
		Adaptation of buildings – creating room for technical documentation centre	Project in implementation
		Transport and packaging means for decommissioning of NPP V-1 – phase 1	Project in implementation
		Supporting decommissioning surveys	Development of tender documentation
GA017D	14 Dec. 2011	PMU Consultant (phase 2)	Project completed
		PMU Consultant (phase 3)	Project completed
		PMU Consultant (phase 4)	Project completed
		PMU Consultant (phase 5)	Project completed
		PMU Consultant (phase 6)	Project in implementation
GA018E	14 Dec. 2011	Implementation of decommissioning program utilizing HR available from NPP V-1 Bohunice, Project 1, Project 2, Project 3, Project 4.1, Project 4.2, Project 5	Project in implementation
GA019F	17 July 2012	Decontamination of primary circuit	Project in implementation
		Dismantling and demolition of external buildings of NPP V-1 – phase 1	Divided to projects D3.1A and D3.1B
		Dismantling and demolition of external buildings NPP V-1 – phase 1	Open tender

		Dismantling and demolition of external buildings NPP V-1 – cooling towers	Development of tender documentation
		Dismantling of machinery room insulations NPP V-1	Project completed
		Feasibility study for handling primary circuit components NPP V-1	Project completed
		Dismantling of equipment in the machinery room	Project in implementation
		Dismantling external non-contaminated equipment and buildings	Project in implementation
		Dismantling of power supply systems	Project in implementation
		Dismantling of diesel generators	Development of tender documentation
		Dismantling of auxiliary building systems – phase 1	Technical specification
		Decontamination of storage pools and other contaminated tanks of NPP V-1 - part 1	Development of tender documentation
		Dismantling of insulations in the controlled zone NPP V-1	Technical specification
		Dismantling of systems in the controlled zone NPP V-1– part 1	Technical specification
GA 020A	14 Dec. 2010	PMU consultant	Project is in preparation phase
		Transformation 400/110 kV Bystričany	Project is in preparation phase
		2x400 kV power lines H. Ždaňa – Bystričany	Project is in preparation phase
		Substation 400 kV H. Ždaňa	Project is in preparation phase
		2x400 kV power lines Bystričany – Križovany	Project is in preparation phase
		Substation 400 kV Križovany	Project is in preparation phase

Annex 2

List of ÚJD SR Decrees

ÚJD SR Decree **No. 30/2012 Coll.**	laying down details of requirements for the handling of nuclear materials, nuclear waste and spent nuclear fuel. (valid from 2012/03/01).
ÚJD SR Decree **No. 31/2012 Coll.**	changing and amending Decree of the Nuclear Regulatory Authority of the Slovak Republic No. 58/2006 Coll., laying down details on the scope, contents and manner of preparation of documentation for nuclear facilities needed for individual decisions. (valid from 2012/03/01).
ÚJD SR Decree **No. 32/2012 Coll.**	amending and supplementing Nuclear Regulatory Authority of the Slovak Republic Regulation No 48/2006 Coll., establishing details on the method of reporting operational incidents and incidents during transport and details on ascertaining their causes. (valid from 2012/03/01).
ÚJD SR Decree **No. 33/2012 Coll.**	on the regular, comprehensive and systematic evaluation of the nuclear safety of nuclear equipment. (valid from 2012/03/01).
ÚJD SR Decree **No. 34/2012 Coll.**	amending and supplementing Nuclear Regulatory Authority of the Slovak Republic Regulation No 52/2006 Coll. on professional qualification. (valid from 2012/03/01).
ÚJD SR Decree **No. 35/2012 Coll.**	changing and amending Decree of the Nuclear Regulatory Authority of the Slovak Republic No. 55/2006 Coll., on details of emergency planning in case of a nuclear incident or accident. (valid from 2012/03/01).
ÚJD SR Decree **No. 430/2011 Coll.**	on details on nuclear safety requirements for nuclear facilities (valid from 1 January, 2012).
ÚJD SR Decree **No. 431/2011 Coll.**	on a quality management system (valid from 1 January, 2012).
ÚJD SR Decree **No. 46/2006 Coll**.	on dual-use goods, which are under the ÚJD SR supervision (March 1. 2006).
ÚJD SR Decree **No. 47/2006 Coll**.	on maximum limits of small quantities of nuclear material and radioactive waste in respect of which no nuclear damage is expected and therefore subject to exclusion from the third party liability regime.
ÚJD SR Decree No. **48/2006 Coll.**	on details of notification of operational events and events during shipment, as well as details of investigation of their reasons
ÚJD SR Decree No. **51/2006 Coll.**	on details concerning requirements for provision of physical protection.
ÚJD SR Decree No. **52/2006 Coll.**	on professional competency.

ÚJD SR Decree No. **54/2006 Coll.**	on accountancy for and control of nuclear material as well as notification of selected activities.
ÚJD SR Decree No. **55/2006 Coll.**	on details concerning emergency planning in case of nuclear incident or accident.
ÚJD SR Decree No. **57/2006 Coll.**	on details concerning the requirements for shipment of radioactive material.
ÚJD SR Decree No. **58/2006 Coll.**	on details concerning the scope, content and method of preparation of nuclear installation documentation needed for certain decisions.

Annex 3

List of Safety Guidelines

BNS I.6.2/2013	Requirements on description of a nuclear reactor in the Safety Analysis Report
BNS I.12.1/2012	Requirements on the quality assurance of software for safety analyses
BNS II.2.1/2012	Requirements on Fire Safety Assurance of Nuclear Installations in view of Nuclear Safety
BNS II.5.1/2012	Welding at nuclear power installations. Basic requirements and rules
BNS II.5.2/2012	Supervision of welding and quality of welded joints of selected nuclear power installations. Requirements
BNS I.11.1/2012	Requirements on the deterministic safety analyses
BNS I.12.3/2012	PSA Quality for PSA applications
BNS II.5.3/2011	Welding materials for welding of engineering & technological components of NPP´s
BNS II.3.3/2011	Metallurgical products and spare parts for nuclear power plants
BNS II.5.4/2009	Qualification of systems for non-destructive examination in nuclear power engineering
BNS II.5.5/2009	Examining of mechanical features, chemical composition and classified characteristics of resistance against violation of marginal condition of materials and weld joins of engineering- technology components of installations of WWER440 type
BNS II.5.6/2009	The rules on design, production, montage, repairing, changing and reconstruction of engineering- technology components of classified equipments of nuclear installations of WWER440 type
BNS I.7.4/2008	Periodic safety review on NPP
BNS II.1.1/2008	Accounting and control of nuclear materials
BNS II.3.1/2007	Evaluation of acceptability of faults detected during the operation inspection of nuclear installation selected equipment
BNS III.4.4/2007	Requirements for realization and evaluation of results of physical tests in start-up process
BNS II.3.4/2006	Corrosion monitoring of safety significant components of nuclear facilities
BNS I.4.2/2006	Requirements for Elaboration of Probabilistic Safety Analyses

BNS I.8.1/2005	Reguirements for Preliminary Plan of Physical Protection and Plan of Physical protection
BNS IV.1.3/2005	Requirements for Design and Operation of Nuclear Spent Fuel Storage Facility
BNS I.2.5/2005	ÚJD SR requirements on chapt. 16 of Safety analysis report "Limits and Conditions"
BNS I.9.1/2003	Safety of nuclear facilities during decommissioning
BNS I.9.2/2001	Ageing management of nuclear power plants – requirements
BNS III.4.3/2000	Requirements on assessment of fuel loading for WWER 440 reactors
BNS III.4.1/2000	Requirements on ÚJD SR permit issue for fuel use in WWER 440 reactors