REPORT

OF THE SLOVAK REPUBLIC

COMPILED IN TERMS OF ARTICLE 14 par.1

COUNCIL DIRECTIVE 2011/70/EURATOM

July 2018

CONTENTS

ABBREVIATIONS

BIDSF	Bohunice International Decommissioning Support Fund
BSC	Bohunice Treatment Centre
BSVP	Storage pool for spent nuclear fuel
Coll.	Collection of laws
DS	Long-term storage
EIA	Environmental Impact Assessment
EU	European Union
FS KRAO	Final processing of KRAO
HVB	Main generating unit
IAEA	International Atomic Energy Agency
INES	International Nuclear Event Scale
IRAW	Institutional Radioactive Waste
IS RAW	Integral Storage Facility for Radioactive Waste
ISFS	Interim Spent Fuel Storage Facility
ISM	Integrated Management System
JAVYS, a. s.	Nuclear and Decommissioning Company/Jadrová a vyraďovacia spoločnosť
KRAO	Liquid radioactive waste
L&C	Limits and Conditions for operation
MDV SR	Ministry of Transport and Construction of the Slovak Republic
MH SR	Ministry of Economy of the Slovak Republic
MPSVR SR	Ministry of Labour, Social Affairs and Family of the Slovak Republic
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
NI	Nuclear Facility / Installation
NIP	National Labour Inspectorate
NNF	National Nuclear fund
NPP	Nuclear Power Plant
NPP A1	NPP Bohunice A1
NPP Mochovce/EMO	NPP Mochovce
NPP V1	NPP V1 Jaslovské Bohunice (Units 1&2)

NPP V2	NPP V2 Jaslovské Bohunice (Units 3&4)
OIK	Citizens Information Committee
PS	Operational set
Ra	Radioactive
RAW	Radioactive Waste
RF	Russian Federation
RÚ RAO	National Repository for Radioactive Waste
SAT	Self-Assessment Tool
SE – EBO	Nuclear Power Plants Jaslovské Bohunice
SE – EMO	Nuclear Power Plants Mochovce
SE - VYZ	Decommissioning of NI and radioactive waste and spent fuel management, former plant of SE, a. s.
SE, a. s.	Slovenské elektrárne, a. s.
SKR	I&C System
SNF	Spent nuclear fuel
SR	Slovak Republic
STN	Slovak Technical Standard / Norm
ŠOV	Special Water Treatment
TK	Transportation container
ŤK	Heavy metal
TK C-30	Transportation container for SNF of C-30 type
TSÚ RAW	Technology of treatment and conditioning of RAW
TV	Television
ÚJD SR	Úrad jadrového dozoru SR/Nuclear Regulatory Authority of the SR
USSR	Union of Soviet Socialist Republics
ÚVZ SR	Úrad verejného zdravotníctva SR/Public Health Authority of the SR
VBK	Fibre-concrete container
VRAO	High-level radioactive waste
VUJE, a. s.	VUJE, a. s. Trnava – Engineering, design and research organization
WENRA	Western European Nuclear Regulators
WWER	Water-water power reactor
ZRAM	Captured radioactive materials

A INTRODUCTION

The purpose of this Report is to fulfil the obligations of the Slovak Republic pursuant to Article 14 par. 1 of the Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. This Directive was transposed by the Act No. 143/2013 Coll., which amended the Act No. 541/2004 Coll. on the peaceful uses of nuclear energy (the Atomic Act), and 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).

Nuclear installations

In the SR there are 4 units with reactors of WWER-440 type in operation. Two units are located at the Jaslovské Bohunice site (referred to as NPP V2) and two at the Mochovce site (EMO 1&2). Two of WWER 440 type (NPP V1) are in the decommissioning process. Spent nuclear fuel from these units has been transported to the Interim Spent Fuel Storage Facility (ISFS).

At the Jaslovské Bohunice site there is also the NPP A1, which was a heavy water reactor cooled with carbon dioxide (HWGCR – 150 MW), fuelled by natural uranium. NPP A1 was shut-down in 1977 after an accident (INES 4) and, currently, it is in the third and fourth stage of its decommissioning. The spent nuclear fuel was exported to the Russian Federation according to the original contract. Transports of spent fuel were completed in 1999.

Technologies for treatment of radioactive waste are located at Jaslovské Bohunice site (called Technology for Treatment and Conditioning of Radioactive Waste (TSÚ RAW), and at the Mochovce site, called Final treatment of Liquid Radioactive Waste (FS KRAO).

The National Repository for low activity radioactive waste (RÚ RAO) located at the Mochovce site is in operation since 1999. Part of the RÚ RAO is also a repository for very low level radioactive waste (VLLW), which has been in operation since 2016.

ISFS is in operation at the Bohunice site since 1987, where a project to increase safety and storage capacity has been implemented.

At the Jaslovské Bohunice site, an integral storage facility for radioactive waste (IS RAW) was built, and has been in operation since December 2017.

Detailed description of the technology for spent nuclear fuel (SNF) and radioactive waste (RAW) management can be found in the following chapters of this report. The licensees for operation and decommissioning of nuclear installations are Slovenské elektrárne, a. s. (hereinafter as SE, a. s.) and Nuclear and Decommissioning Company (Jadrová a vyraďovacia spoločnosť - hereinafter as JAVYS, a. s.).

Sealed and open radioactive sources

Currently there are approx. 150 legal entities and natural persons in the Slovak Republic, which have an authorization for the use of sealed and open radioactive sources. These are entities operating in different sectors of economy, in health care, schools, research, defence, etc.

For the safety of institutional radioactive waste (IRAW) management, including disused sealed sources, the same principles apply as for the management of sources themselves:

- the exposure of staff and the public is as low as reasonably achievable,
- unauthorized handling of sources or radioactive waste is prevented.

Regulatory bodies

The basic law for peaceful use of nuclear energy is the Act No. 541/2004 Coll. (the Atomic Act). The state regulation of nuclear safety for radioactive waste and spent nuclear fuel management is vested in the Nuclear Regulatory Authority (ÚJD SR). ÚJD SR acts also as a special building authority for the construction of nuclear installations under the Act No. 50/1976 Coll. on Spatial Planning and Construction Code (Construction Act).

The state supervision over radiation protection in nuclear installations is provided for by the Public Health Authority of the Slovak Republic (ÚVZ SR) pursuant to Act No. 87/2018 Coll. on Radiation Protection.

Nitra Labour Inspectorate supervises the observance of legislation and other regulations to ensure safety and health at work at workplaces of nuclear facilities in accordance with Act No. 125/2006 Coll. on the Labour Inspection. Verification of the fulfilment of the safety requirements of classified technical equipment and other technical equipment is carried out by authorized legal entities under the Act No. 124/2006 Coll. on safety and health at work and on amendments to certain laws.Assessment of the impact of NI on the environment is the competence of the Ministry of Environment in compliance with the Act No. 24/2006 Coll. on Environmental Impact Assessment.

Slovak Republic is a contracting party to various international treaties and conventions in the field of peaceful use of nuclear energy (as listed in chapter E.3).

By the Government resolution No. 256/2014 the “Policy, Principles and Strategy for Further Development of Nuclear Safety” was adopted. The aim of the document is to summarize and strengthen the principles to protect the public and the environment from harmful effects of ionizing radiation associated with peaceful uses of nuclear energy. The document (based on Safety Fundamentals of the International Atomic Energy Agency No. SF-1) is intertwined with other strategic documents that exist in this field:

- Manifesto of the Government for the period 2012 – 2016,
- Energy Security Strategy (2008),
- Strategy for the Back-End of Nuclear Energy in the SR,

- Proposal of National Policy and National Program for Spent Nuclear Fuel and Radioactive Waste Management in the SR as an update to the paper on the Strategy for the Back-End of the Peaceful Use of Nuclear Energy in the SR.

National policy and program

According to Act No. 238/2006 Coll. on National Nuclear Fund, as amended by Act No. 143/2013 Coll. (National Nuclear Fund) the Board of Trustees of the National Nuclear Fund submits the draft National Policy and the National Programme for the Management of RAW and SNF to the Ministry of Economy of the SR (MH SR) together with the opinion of ÚJD SR. Subsequently, the MH SR submits the proposal of National Policy and the proposal of National Program and, every six years, their updates to the Government for approval. The Government approved the proposal National Policy and the proposal National Programme by the Resolution No. 387/2015 on 8 July 2015.

The present Report is the second one being elaborated in accordance with the Council Directive 2011/70/Euratom.

Basic features of the current concept for spent nuclear fuel management in SR can be summarized as follows:

- Nuclear reactors operated in the SR apply open fuel cycle. Currently, it is not possible to realize a closed fuel cycle, because the WWER-440 reactors in the SR are not licensed to use reprocessed MOX fuel.
- For SNF management it is not considered to export SNF for reprocessing abroad and a subsequent return of products from reprocessing (Pu, U, high active RAW) back to the SR.
- Short-term storage of SNF (3 - 7 years following its removal from the reactor) is provided by storage pools for SNF near reactors (BSVP), located at each reactor.
- Long-term storage of SNF (40 - 50 years and more after its utilization in the reactor) is in the ISFS, which is a separate storage facility for SNF at the Bohunice site.
- The long-term goal in the concept of the SNF management is the enhancement of capacity of the current ISFS for the needs of the nuclear power plants in the SR with the dry storage technology and monitoring of the dual path scenario for the final stage of spent fuel management, namely by developing a national deep repository for direct disposal of spent nuclear fuel and radioactive waste not disposable at the RU RAW in Mochovce, and by participating in activities that could lead to international deep repository, i.e. repository jointly owned and operated by several states on the basis of relevant international treaties.
- Future decisions in the field of SNF management will reflect the technical and legislative development that is taking place in the European Union and in the world.

The whole production of SNF from the NPP A1 (HWGCR reactor type, in operation from 1973 till 1977) was exported to the former USSR and later to the Russian Federation until 1999. Small portion

of SNF from WWER-440 reactors (697 fuel assemblies) was exported to the former USSR prior to 1987.

Characteristics of the current management of radioactive waste in the SR:

- Maximal use of the current technology equipment for the treatment and conditioning of radioactive waste (RAW), which are located in Jaslovské Bohunice and Mochovce - TSÚ RAW and FS KRAO.
- Basic methods for solidification of liquid RAW, radioactive sludge and spent ion exchange resins into a form suitable for final disposal are the following technologies: cementation, bituminization and solidification in a SIAL matrix (geopolymer) and incineration.
- The volume of solid RAW is minimized by compacting, incineration and preventive measures.
- Treated liquid or solid RAW is placed into fiber-concrete containers covered with active sealing, made of cement mixture and liquid radioactive waste (KRAO). These containers are suitable for transport and storage, as well as for disposal in the RU RAO.
- For the treatment of intermediate level RAW or RAW with high trans-uranium content (specific liquid RAW from storage of spent fuel from NPP A1 as sludge and chrompik – mixture of K_2CrO_4 and $K_2Cr_2O_7$) there is a vitrification technology available.
- Very low level RAW is disposed of at the Mochovce site in the premises of RÚ RAO. The first module of the repository for very low level waste for VLLW from NPP A1 was put into operation in June 2016. Construction of the second module of storage facilities for VLLW from NPP V1 was carried out in 2017.
- Available technology (high pressure compacting, cementation, etc.) is used for the treatment and conditioning of metal RAW. Low level metal waste is treated by fragmentation and decontamination, followed by release of decontaminated material into the environment. With regard to the increase in metal RAW that cannot be released into the environment, Facility for melting of metal RAW is currently being constructed as a part of TSÚ RAW, for volume reduction, its treatment and further recycling.
- Materials contaminated with radioactive substances meeting the criteria for release to the environment (in particular building materials) are separated and treated prior to release (by crushing) with subsequent use.
- IRAW, disused sealed sources and captured radioactive materials (ZRAM) are stored in the „Facility for the management of IRAW and ZRAM“ that was built and put into operation in February 2016 at the Mochovce site until their final treatment, conditioning and disposal. IRAW and ZRAM are conditioned into the form acceptable for permanent storage, using standard technology used for RAW from nuclear installations.
- Long-term storage of treated RAW (e.g. Chrompik vitrificate) is provided for in specially adapted premises at the Jaslovské Bohunice site.

- Conditioned RAW from operation and decommissioning of NPPs, as well as conditioned IRAW meeting the acceptance criteria are stored in RÚ RAO in Mochovce.
- Radioactive waste that does not meet the criteria for disposal in RÚ RAO is stored long-term at the site of the nuclear power plants. The IS RAW was built at the Jaslovské Bohunice site for storage of RAW that cannot be disposed at RÚ RAO. The integral storage facility for RAW consists of a self-standing building object of a hall type with modular arrangement with the possible further extension.
- RAW that does not meet the storage criteria for surface type of repository, will be disposed in the deep repository. In 2016, the first stage of the development of the deep repository in the SR – site screening - has been completed, and the first part of the second stage is under way.
- The RAW transports are realized exclusively using approved transport facilities.

The costs of transporting and management of RAW from decommissioned nuclear installations and the costs of shipment and management of SNF from the decommissioned NPPs are covered by the National Nuclear Fund and BIDSF funds. The costs of shipments and management of RAW and SNF from the NPP operation are covered from the operational costs of producers of radioactive waste and SNF.

B RECENT DEVELOPMENTS

Developments in the area of back-end of the fuel cycle of the peaceful use of nuclear energy in the SR in the period since the last report in 2015 can be characterized as the continuation of the implementation of the strategy that has been embodied in the national program **(see section K of this report)**.

This development is characterized by the continuation in the phased decommissioning of nuclear power plants A1 and V1 in Jaslovské Bohunice, storage of SNF from the shut-down Units of NPP V1 and from the operated units of NPP V2 and EMO 1&2 in ISFS in Jaslovské Bohunice and the management of RAW from the decommissioning of NPP A1 and NPP V1, from the operated Units, as well as the institutional RAW on the existing treatment technology aimed at creating the final form that can be disposed in the National Repository for RAW in Mochovce.

Along that, part of this development was the provision of additional facilities, specified by the strategy and the programme, needed to create conditions for enhancing safety and improving and optimizing the overall process in decommissioning of Nuclear Installations (NI) and management of SNF and RAW.

Such activities include, in particular:

- Construction of a facility for centralized collection, sorting and storage of institutional RAW and captured radioactive materials at the Mochovce site.
- Construction of the IS RAW.
- Preparing for the construction of a dry interim storage facility for SNF in Jaslovské Bohunice.
- Preparing the construction and the construction of the facility for melting metal RAW in Jaslovské Bohunice.
- Change of the system for treatment of liquid radioactive concentrates in Mochovce NPP in a form of separation of radionuclides from liquid concentrates.
- Construction and commissioning of a repository for very low-level waste in the National Repository for RAW Mochovce.
- Implementation of a strategy for deep geological repository, including public involvement/public consultations, site selection criteria, etc.

These core activities, since the last report from 2015, include also the preparation of the updated Nuclear Fund Act and preparation of the new Radiation Protection Act.

The main activities in the field of decommissioning of NI include the completion of phase II of decommissioning of NPP A1, and preparation and commencement of phases III and IV, and launching of phase II of decommissioning of NPP V1.

These activities are described in more detail in section K of this report.

C SCOPE AND INVENTORY (art. 2, 12.1(C), 14.2(b))

Criteria Used to Define and Classify Radioactive Waste

In the Slovak Republic (according to the legal definition contained in the Atomic Act) radioactive waste shall mean any unusable material in gaseous, liquid or solid form, which due to the content of radionuclides or due to the level of their contamination with radionuclides cannot be released into the environment.

The limit of concentrations allowing release radioactive substances to the environment for the individual radionuclides is stated in Annex 5 to the Act No. 87/2018 Coll. on Radiation Protection.

Classification of radioactive waste (according to the IAEA GSG-1) is based on their activity and is defined by Section 5 of the ÚJD SR Decree No. 30/2012 Coll., laying down the details of the requirements for the management of nuclear materials, radioactive waste and spent nuclear fuel:

a) **transient radioactive wastes** whose activity falls below the limit value for their introduction to the environment during storage;

b) **very low-activity radioactive waste**, whose activity is slightly higher than the limit value for their introduction to the environment, contain mainly radionuclides with a short half-life,or also a low concentration of radionuclides with a long half-life, and which during storage require a lower degree of isolation from the environment through a system of engineered barriers, as in the case of surface-type radioactive waste repositories;

c) **low-activity radioactive waste**, whose average specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, is less than 400 Bq/g, maximum specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, is locally less than 4000 Bq/g, does not produce residual heat, and following treatment meet safe operating limits and conditions for surface-type radioactive waste repositories;

d) **medium-activity radioactive waste**, whose average specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, is equal to or over 400 Bq/g, may produce residual heat and measures for its removal are less than in the case of highly active radioactive waste, and which following treatment do not meet safe operating limits and conditions for surface-type radioactive waste repositories;

e) **highly-active radioactive waste**, whose average specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, exceeds values specified for low-activity radioactive waste requiring measures for the removal of residual heat and can be deposited only in an underground-type radioactive waste repository.

The inventories of spent nuclear fuel and of radioactive waste is listed in annexes III and IV.

As regards the future prospects of generating radioactive waste and spent nuclear fuel in the SR, this information can be found in the National Programme, which is available on the website of the National Nuclear Fund for Decommissioning of Nuclear Installations and for the Management of Spent Nuclear fuel and Radioactive Waste (“NNF“):

http://www.njf.sk/dokumenty/politika_a_program/The_National_Programme_for_handling_of_SNF_and_RW_in_SR.pdf

D GENERAL PRINCIPLES AND POLICIES (art. 4)

1. *Member States shall establish and maintain national policies on spent fuel and radioactive waste management. Without prejudice to Article 2(3), each Member State shall have ultimate responsibility for management of the spent fuel and radioactive waste generated in it. EN L 199/52 Official Journal of the European Union 2.8.2011*

2. *Where radioactive waste or spent fuel is shipped for processing or reprocessing to a Member State or a third country, the ultimate responsibility for the safe and responsible disposal of those materials, including any waste as a by-product, shall remain with the Member State or third country from which the radioactive material was shipped.*

3. *National policies shall be based on all of the following principles:*
   a) *the generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials;*
   b) *the interdependencies between all steps in spent fuel and radioactive waste generation and management shall be taken into account;*
   c) *spent fuel and radioactive waste shall be safely managed, including in the long term with passive safety features;*
   d) *implementation of measures shall follow a graded approach;*
   e) *the costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials;*
   f) *an evidence-based and documented decision-making process shall be applied with regard to all stages of the management of spent fuel and radioactive waste.*

4. *Radioactive waste shall be disposed of in the Member State in which it was generated, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with Article 16(2) of Directive 2006/117/Euratom, has entered into force between the Member State concerned and another Member State or a third country to use a disposal facility in one of them.*

   Prior to a shipment to a third country, the exporting Member State shall inform the Commission of the content of any such agreement and take reasonable measures to be assured that:

   a) *the country of destination has concluded an agreement with the Community covering spent fuel and radioactive waste management or is a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ('the Joint Convention');*

   b) *the country of destination has radioactive waste management and disposal programmes with objectives representing a high level of safety equivalent to those established by this Directive;*

c) the disposal facility in the country of destination is authorised for the radioactive waste to be shipped, is operating prior to the shipment, and is managed in accordance with the requirements set down in the radioactive waste management and disposal programme of that country of destination.

National Policy for Spent Fuel Management (SNF) and radioactive waste (RAW) management

The Board of Trustees of the National Nuclear Fund for Decommissioning of Nuclear Installations and for the Management of Spent Nuclear Fuel and Radioactive Waste ("NNF") in cooperation with other stakeholders elaborates:

a) Draft National Policy for the Management of Spent Nuclear Fuel and Radioactive Waste (hereinafter only as the "National Policy") and
b) Draft National Programme for the Implementation of the National Policy (hereinafter only as the "National Programme").

The National Policy is based on the following principles:

a) The Slovak Republic has the ultimate responsibility for the decommissioning of nuclear installations located in the SR, for the safe and responsible long-term storage and disposal of spent nuclear fuel and for the radioactive waste management, which has been produced in its territory after its takeover from the producer,
b) The ultimate responsibility for the safe and responsible disposal of radioactive waste or of spent fuel to be transported from the Slovak Republic for conditioning or reprocessing to a Member State of the European Union or to a third country, including any waste generated as a by-product of conditioning or reprocessing, is borne by the Slovak Republic, unless the international treaty, by which the Slovak Republic is bound, stipulates otherwise,
c) Production of radioactive waste in terms of its activity and volume is maintained at the lowest level, which is reasonably achievable, by means of appropriate design measures and operating procedures and decommissioning practices, including recycling and reuse of materials,
d) The interdependencies between all steps of spent nuclear fuel and radioactive waste management are taken into account,
e) Management of spent nuclear fuel and radioactive waste shall be safe, even in the long-term, especially when applying passive safety features,
f) Graded approach is applied in the management of spent nuclear fuel and radioactive waste, taking into account in particular its activity, amount, type of nuclear installation, in which they are handled and their other hazardous properties,
g) The costs of management of spent nuclear fuel and radioactive waste shall be borne by the person, who produced them, in case of an unknown originator, appropriate measures are taken,
h) Documenting the decision-making process is based on evidence and results of characterization at all stages of management of spent nuclear fuel and radioactive waste.

Goals of the National Policy of the SR are the following:

1. Safe and reliable decommissioning of nuclear installations
2. Waste minimization
3. Selection of a suitable fuel cycle
4. Safe storage
5. Management of radioactive waste
6. Nuclear safety
7. Application of graded approach
8. The principle of “polluter pays“
9. Objective decision-making process
10. Liability

The national policy for spent nuclear fuel and radioactive waste management, as well as the national programme for spent nuclear fuel and radioactive waste management were approved by the Government Resolution No. 387/2015 on 8 July 2015. These documents are available on the website of NNF: http://www.njf.sk/strategia.htm

The Board of Trustees of NNF, together with relevant stakeholders, elaborates a report on the implementation of the National Programme once a year for the previous year and, together with ÚJD SR´s opinion, submits it for approval to the MH SR.

Radioactive Waste Generation Minimization Program

The requirement for minimization of RAW production is set out in the Atomic Act. The Act No. 87/2018 Coll. on radiation protection requires the holder of authorization to limit production of radioactive waste to unavoidable level. The principle of minimizing RAW production is applied in accordance with the legislative requirements. Fulfilment of the programs for production and management of RAW is reviewed annually in the “RAW Management Report”. This report proposes new measures to minimize RAW production for the following period.

Two documents have been elaborated for radioactive materials containing radioactive nuclides below the clearance level. The “Proposed Procedure for Measuring Low-level Contaminated Materials from the Operation of NPP V1, V2 and their Entry into the Environment” and the “Methodology for the Entry of Low-level Contaminated Waste from the Operation of NPP V1, V2 to the Environment.” Authorization for placing radioactive substances to the environment was issued in 2003 by the Public Health Authority of the SR for the Jaslovské Bohunice site and in 2004 for the Mochovce site.

Connection between Stages of Radioactive Waste (RAW) Management

Basic information for correct identification and categorization of RAW during packaging and handover, or during takeover for the purpose of treatment and conditioning in the relevant technological facility provides document “Generic Catalogue of Radioactive Waste” (PP 15-INŠ—001, rev. 3), which was prepared by JAVYS, a. s.

The document also defines principles and conditions for RAW acceptance to be treated and conditioned so as to meet the requirements for creating a product during the treatment and conditioning of these RAW, which would comply with criteria for permanent disposal at RÚ RAO Mochovce and would not endanger safety operating personnel during any further manipulations of RAW including transports. The criteria of acceptance are included in limits and conditions of relevant installation.

A part of the document “Plan of Radioactive Waste and Spent Nuclear Fuel Management Including their Transport”, which is submitted by the operator and reviewed by ÚJD SR prior to construction and operation of RAW management facilities, are also descriptions and analyses of RAW streams containing the following activities:

- Storage of untreated RAW;
- RAW treatment,
- Storage of intermediate products,
- Shipment between individual steps,
- RAW conditioning.

Prior to starting the RAW management itself, it is necessary to characterize the physical and chemical and radiochemical properties of a specific type of RAW, stated on the accompanying sheet of RAW in the packaging (required by the ÚJD SR Decree No.30/2012 Coll.). The accompanying sheet is handed over together with RAW at individual stages of activities relating to RAW management.

Safety requirements on particular activities are listed in the ÚJD SR Decree No. 30/2012 Coll., laying down the details on the requirements for nuclear materials, radioactive waste and spent nuclear fuel management.

Before commissioning and during operation, operational procedures, which take into account relations between individual steps of RAW management, are elaborated and improved. The handing-over of RAW within JAVYS, a. s., and between the producer of RAW and JAVYS, a. s., is subject to operational procedures and is contractually covered.

E NATIONAL FRAMEWORK (art. 5)

1. *Member States shall establish and maintain a national legislative, regulatory and organisational framework ('national framework') for spent fuel and radioactive waste management that allocates responsibility and provides for coordination between relevant competent bodies. The national framework shall provide for all of the following:*

   a) a national programme for the implementation of spent fuel and radioactive waste management policy;

   b) national arrangements for the safety of spent fuel and radioactive waste management. The determination of how those arrangements are to be adopted and through which instrument they are to be applied rests within the competence of the Member States;

   c) a system of licensing of spent fuel and radioactive waste management activities, facilities or both, including the prohibition of spent fuel or radioactive waste management activities, of the operation of a spent fuel or radioactive waste management facility without a licence or both and, if appropriate, prescribing conditions for further management of the activity, facility or both;

   d) a system of appropriate control, a management system, regulatory inspections, documentation and reporting obligations for radioactive waste and spent fuel management activities, facilities or both, including appropriate measures for the post-closure periods of disposal facilities;

   e) enforcement actions, including the suspension of activities and the modification, expiration or revocation of a licence together with requirements, if appropriate, for alternative solutions that lead to improved safety;

   f) the allocation of responsibility to the bodies involved in the different steps of spent fuel and radioactive waste management; in particular, the national framework shall give primary responsibility for the spent fuel and radioactive waste to their generators or, under specific circumstances, to a licence holder to whom this responsibility has been entrusted by competent bodies;

   g) national requirements for public information and participation;

   h) the financing scheme(s) for spent fuel and radioactive waste management in accordance with Article 9.

2. *Member States shall ensure that the national framework is improved where appropriate, taking into account operating experience, insights gained from the decision-making process referred to in Article 4(3)(f), and the development of relevant technology and research.*

Introduction

Brief information on the national programme for the implementation of spent fuel and radioactive waste management policy can be found in chapter D.

E.1 Legislative and Regulatory Framework

The legal system of the Slovak Republic is divided as follows:

1. The Constitution as the supreme basic act of the State approved by the National Council of the Slovak Republic, by at least 3/5 majority of all deputies – is generally binding.
2. Constitutional laws – also approved by the National Council of the Slovak Republic by at least 3/5 majority of all the deputies – are generally binding.
3. The Acts stipulate the basic rights and obligations specifying the principles in different areas and are approved by the National Council of the Slovak Republic – are generally binding.
4. Government Ordinances are subject to laws and approved by the Government – are generally binding.
5. Decrees and measures are rules issued by the central government authorities (e.g. ministries and other central government authorities), to lay down the details for the implementation of laws and government ordinances – are generally binding.
6. Slovak Technical Standards (STN), European Technical Standards (STN EN) and International Technical Standards (STN ISO) – are recommendatory.
7. Guides (manuals) contain detailed requirements and recommended steps to ensure that requirements are met. They are issued by the regulatory authorities.
8. Internal standards (such as directives and orders) are the internal organizational rules of the supervisor and form the basis for the internal quality assurance system of the regulator – are recommendatory in their nature.

E.2 Acts in the field of State Regulation

The use of nuclear energy is governed by the **Act No. 541/2004 Coll. on the peaceful use of nuclear energy** (the Atomic Act) and on amendments to certain laws. The Atomic Act and the subsequent decrees define the basic rules, including a licensing system for the management of SNF and RAW, and ban of such management without the appropriate authorization. The said legal regulations also define the system of regulatory activities and control of management of this waste. It came into effect on 1st December 2004 and repealed the precedent Atomic Act No. 130/1998 Coll., as well as all its implementing decrees. Since the Atomic Act is in force, it has been amended eighteen times.

The Atomic Act lays down conditions for safe use of nuclear energy exclusively for peaceful purposes in accordance with international treaties binding for the Slovak Republic.

(1) This Act governs inter alia:

a) The peaceful uses of nuclear energy,

b) The state administration, state regulation and the responsibilities of ÚJD SR,

c) Categorization of nuclear materials, conditions for the management of nuclear materials,

d) The safe and responsible management of radioactive waste and spent nuclear fuel, so as to avoid imposing undue burdens on future generations and ensuring the protection of workers and the public,

e) The continuous improvement of nuclear safety,

f) Verification of special professional competence of staff of license holders,

g) Emergency preparedness.

h) rights and obligations of natural persons and legal entities in peaceful use of nuclear energy,

i) offences and other administrative delicts in the field of nuclear regulation.

(2) Cross-border shipments of radioactive waste and spent nuclear fuel including spent nuclear fuel exported for reprocessing, etc.

In accordance with the Atomic Act, the nuclear installation is defined as a set of civil building objects and the necessary technology in the configuration set by the design designed for:

1. Generation of electric energy or for research in the field of nuclear energy, part of which is a nuclear reactor or nuclear reactors, which will utilize, or are utilizing controlled fission chain reaction,
2. Management of nuclear materials in volumes greater than one effective kg except for storage areas, containers and shelters, where nuclear material is used as shielding material for radioactive sources, facilities for treatment of uranium ore and storage of uranium yellowcake,
3. Management of spent nuclear fuel,
4. Management of radioactive waste, or
5. Uranium enrichment or fabrication of nuclear fuel.

The Act No. 143/2013 Coll. amended the Atomic Act and the Act No. 238/2006 Coll. on the National Nuclear Fund due to a consistent transposition of the Council Directive 2011/70/Euratom of 19 July 2011, establishing the Community framework for the responsible and safe management of spent fuel and radioactive waste.

As a result of transposition of Council Directive 2014/87/Euratom of 08 July 2014, amending Council Directive 2009/71/Euratom, establishing a Community framework for nuclear safety of nuclear installations, ÚJD SR prepared an amendment to the Atomic Act. The amendment to the Atomic Act also partially transposes Council Directive 2013/59/Euratom laying down basic safety standards for protection against the dangers arising from ionizing radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (the so called „new Basic Safety Standards“), tightens in particular the safety requirements for nuclear installations (in-depth protection, nuclear safety culture, qualified staff, contractors), introduces new definitions (abnormal operation, design basis, design-basis accident, severe conditions),regulates

transparency, public access to information, emergency preparedness and response, the contact point and also introduces peer reviews (self-assessment – 10-year cycle and thematic reviews – 6-year cycle). The amendment was published in the Collection of Laws of the SR under No. 96/2017 and entered into force on 01 August 2017.

Civil liability for nuclear damage suffered as a consequence of a nuclear accident is governed by the **Act No. 54/2015 Coll. on civil liability for nuclear damage and its financial coverage.** This act entered into force on 01 January 2016. Among others, it sets an amount of 300 000 000 EUR as the operator´s financial liability limit for nuclear damage caused by nuclear incident at a nuclear installation for energy purposes, and an amount of 185 000 000 EUR as a limit of financial liability of the operator for other nuclear installations, the transport of radioactive materials and nuclear installations in decommissioning.

Generally binding legal regulations implementing the Atomic Act and issued by ÚJD SR in a form of decrees are listed in Annex V.

ÚJD SR also issues safety guides to explain and specify in more details the legal requirements (Annex VI.).

The Act No. 575/2001 Coll. on Organization of Governmental Activities and of Central State Administration (the Competence Act) defines the framework of tasks and responsibilities of central state administration authorities. The provision on ÚJD SR is contained in section 29 of the Competence Act.

The Act No. 251/2012 Coll. on the energy sector, repealed the original Act No. 656/2004 Coll. on the energy sector. The Energy Act governs the terms and conditions for doing business in the nuclear energy sector as well as the rights and obligations of legal entities doing business in this field, as well as the state supervision and control over doing business in the energy sector.

The Act No. 250/2012 Coll. on regulation in network industries governs conditions and the method of regulation in network industries. Network industry covers the power generation sector. Activities performed in the network industries are considered as regulated activities, which require permit from the Regulatory Office for Network Industries. This Act governs the conditions under which regulated activities are performed, the duties of regulated subjects and the rules of the internal electricity and gas market.

The Act No. 24/2006 Coll. on environmental impact assessment with the aim to strengthen and ensure high environmental protection, the Act establishes a procedure for expert and public environmental impact assessment:

1. Strategic documents prior to their approval (*e. g., concept* for radioactive waste and spent nuclear fuel management, the national program of radioactive waste and spent nuclear fuel management); and
2. Proposed activities prior to the decision on their siting or prior to their approval according to special regulations (construction of nuclear installations and relating activities).

The Act defines activities that are obligatory subject to international assessment from the aspect of their environmental impact:

- Nuclear power plants and other facilities with nuclear reactors (except research installations for the production and conversion of fissile and enriched materials, where the maximal thermal output does not exceed 1 kW of continuous thermal output) including their decommissioning and disposal. Nuclear power plants and nuclear reactors cease to be such facilities when the nuclear fuel and other radioactively contaminated elements are permanently removed from their territory.
- Installations for reprocessing of spent nuclear fuel;
- Facilities for the production or enrichment of nuclear fuel and research facilities for the production and conversion of nuclear fuel and nuclear fuel raw materials;
- Installations for the treatment of spent nuclear fuel and high activity radioactive waste
- Deep geological repositories of spent nuclear fuel and high level waste;
- Installations for storage (planned for more than 10 years) of spent nuclear fuel or radioactive waste in a different site than the production site;
- Installations for the treatment, conditioning and disposal of intermediate and low level waste (LLW) from operation and decommissioning of nuclear power plants and the use of radionuclides;
- Other facilities for management of radioactive waste including their storage, if they are not listed above.

The Ministry of Environment of the Slovak Republic is the competent authority to assess transboundary environemental impacts.

The Act No. 238/2006 Coll. on the National Nuclear Fund for the Decommissioning of Nuclear Installations and for the Management of Spent Nuclear Fuel and Radioactive Waste (Act on Nuclear Fund). The Nuclear Fund is an independent legal entity, which is managed by the MH SR. The Fund has its own bodies (Council of Administrators, Supervisors Board, Director, managers of sub-accounts, auditor). The sources of the Nuclear Fund are various – contributions paid by the licensees for operation of nuclear facilities, charges collected by the operators of the transmission and the distribution systems in the prices of supplied electricity directly from end customers (serving for compensation of the so called “historical debt“), fines imposed by ÚJD SR, interests earned on deposits, subsidies and contributions from the EU, from the state budget, and other. The details on the method of collection and payment of mandatory contributions, including its calculation is specified by the Government Regulation No. 312/2007 Coll.

At present, a new Act on the National Nuclear Fund is under preparation, which was submitted for inter-ministerial commenting procedure on 30 May 2018, and which introduces, among other things, significant changes in the division of responsibilities for some activities in the back-end of the nuclear fuel cycle in the Slovak Republic, and redefines the method of calculation and determination of the amount of compulsory contributions and payments to the Nuclear Fund.

The Board of Trustees of the NNF for Decommissioning of Nuclear Installations and for Management of Spent Nuclear Fuel and Radioactive Waste in cooperation with other stakeholders elaborates:

a) Draft National Policy for Management of Spent Nuclear Fuel and with Radioactive Waste (hereinafter only as the "National Policy") and
b) Draft National Programme for the implementation of the National Policy (hereinafter only as the "National Programme").

The Act No. 87/2018 Coll. on radiation protection regulates the performance of state administration in the field of radiation protection, the conditions for carrying out activities leading to exposure, and activities in the environment with natural sources of radiation, requirements for the management of radioactive substances, institutional radioactive waste and radioactive materials of unknown origin, transit of radioactive materials, protection of staff and the population against radon exposure in the indoor of the buildings, external exposure from building materials and persisting exposure resulting from emergency situation or as a result of human activity in the past, ensuring security of the radioactive source, preparedness for emergency situations from exposure, monitoring of radiation situation and radiation monitoring network, limitation of exposure from drinking water, natural mineral water and spring water, obligations of natural persons and legal entities in the provision of radiation protection, offences, other administrative delicts and sanctions in the field of radiation protection. Performing activities and providing services important in terms of radiation protection in relation to the level of potential radiation risk are divided into activities that are excluded from the operation of the law, activities subject to notification obligation, activities and services subject to registration and activities and services performed under the authorization. The Act also defines the requirements to ensure physical protection when using radioactive sources to prevent misuse of radioactive sources for illicit handling, including the possibility of their misuse for terrorist purposes. Details on the requirements for ensuring radiation protection for the implementation of the Act are laid down in the implementing decrees of the Ministry of Health of the SR listed in Annex V.

The Act No. 125/2006 Coll. on labour inspection and Act No. 82/2005 Coll. on undeclared work and on illegal employment governs the labour inspection, through which it promotes protection of employees at work and execution of state administration in labour inspection, defines the competencies of bodies of state administration in labour inspection and their competence in executing oversight according to special regulation (Act No. 264/1999 Coll. on technical requirements for products and on conformity assessment amended by Act No. 133/2013 Coll.), establishes rights and obligations of labour inspector and duties of natural and legal entities. Related generally binding legal regulations are listed in Annex V.

The Act No. 124/2006 Coll. on occupational health and safety lays down the general principles for prevention and the basic conditions for ensuring occupational health and safety, to exclude risks and factors underlying the emergence of industrial accidents, occupational diseases and other damage to health from work. An integral part of occupational health and safety is the safety of technical equipment. The follow up generally binding legal regulations are listed in Annex V.

Amending the **Act No. 50/1976 Coll. on spatial planning and the construction code** (the Construction Act) with effect from 01. 12. 2004 ÚJD SR became a special building authority for constructions of nuclear installations and construction related to nuclear installation located within the premises of a nuclear installation.

Note: Prior to issuing decision on siting of a structure relating to a structure, part of which is a nuclear installation, the building authority is obliged to request a binding opinion from ÚJD SR, which may condition its consent by fulfilment of conditions.

Identification of the bodies responsible for the preparation and issuance of national regulations to meet the requirements for nuclear safety

ÚJD SR has prepared for example the following bills:

Generally binding legal regulations implementing the Atomic Act and issued by ÚJD SR in a form of decrees are listed in Annex V.

ÚJD SR also issues safety guides to explain and specify in more details the legal requirements (Annex VI.).

Overview of the process of developing and revising national nuclear safety requirements, including stakeholder involvement

Legislative rules of the Government of the Slovak Republic approved by the Government Resolution of 4 May 2016 No. 164 as amended by the Government Resolution of 28 September 2016 No. 441 bindingly determine the rules for development of generally binding legal regulations and regulate the procedure by the ministries and other public authorities.

On 1 January 2016, the Act No. 400/2015 Coll. on development of legislation and on the Collection of Laws of the Slovak Republic and on amendments to certain laws, became effective.

According to these documents, the submitter (in case of the Atomic Act and the implementing decrees it is ÚJD SR) drafts preliminary information on the draft law or decree, and sends it through the Slov-lex portal to all concerned parties. Subsequently the draft law or decree will be sent for consultation with the business environment.

The submitter shall discuss the draft law with the competent authorities and institutions in the preliminary commenting procedure and then in the inter-ministerial commenting procedure, which is public and accessible via the Slov-lex portal, where the public can also make comments. The draft law shall be submitted for discussion to the Legislative Council of the Slovak Government.

After approval by the Legislative Council of the Slovak Government, the draft law follows the procedure of intra-community commenting within the EU under Art. 30 – 33 of the Euratom Treaty and as a technical regulation in a partially unharmonized area also under Directive of the European Parliament and the Council 2015/1535 of 9 September 2015, laying down a procedure for the provision of information in the field of technical regulations and rules on information society services. After passing this process, the bill is submitted to the Slovak Government.

The bill that has been approved by the Government is submitted to the National Council of the SR.

After the adoption of the law in the National Council of the SR and after signature by the President of the SR, the law is announced by publication in the Collection of Laws of the SR.

E.3 International Treaties and Conventions

The Slovak Republic is a party to various international treaties and conventions in the field of the peaceful use of nuclear energy, for example:

- Treaty on Non-Proliferation of Nuclear Weapons
- Statute of the International Atomic Energy Agency
- Agreement between the CSSR and the IAEA for the application of safeguards in connection with Treaty on the non-proliferation of nuclear weapons
- Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil Thereof (Seabed Treaty)
- Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and under Water
- Convention on Physical Protection of Nuclear Material
- Amendment to the Convention on Physical Protection of Nuclear Material
- Convention on Early Notification of a Nuclear Accident
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Comprehensive Nuclear Test-Ban Treaty

The Slovak Republic has concluded also bilateral intergovernmental agreements on peaceful uses of nuclear energy and information exchange with all neighbouring countries, as well as with other countries. These intergovernmental treaties also include cooperation or exchange of information in the field of spent nuclear fuel and radioactive waste management.

F STRUCTURE OF GOVERNMENT / REGULATORY BODIES (art. 6)

1. *Each Member State shall establish and maintain a competent regulatory authority in the field of safety of spent fuel and radioactive waste management.*
2. *Member States shall ensure that the competent regulatory authority is functionally separate from any other body or organisation concerned with the promotion or utilisation of nuclear energy or radioactive material, including electricity production and radioisotope applications, or with the management of spent fuel and radioactive waste, in order to ensure effective independence from undue influence on its regulatory function.*
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 as described in Article 5(1)(b), (c), (d) and (e).*

Regulation of the peaceful use of nuclear energy is performed by the governmental bodies and organizations within the framework of their competence defined by the respective acts according to the structure described in figure.

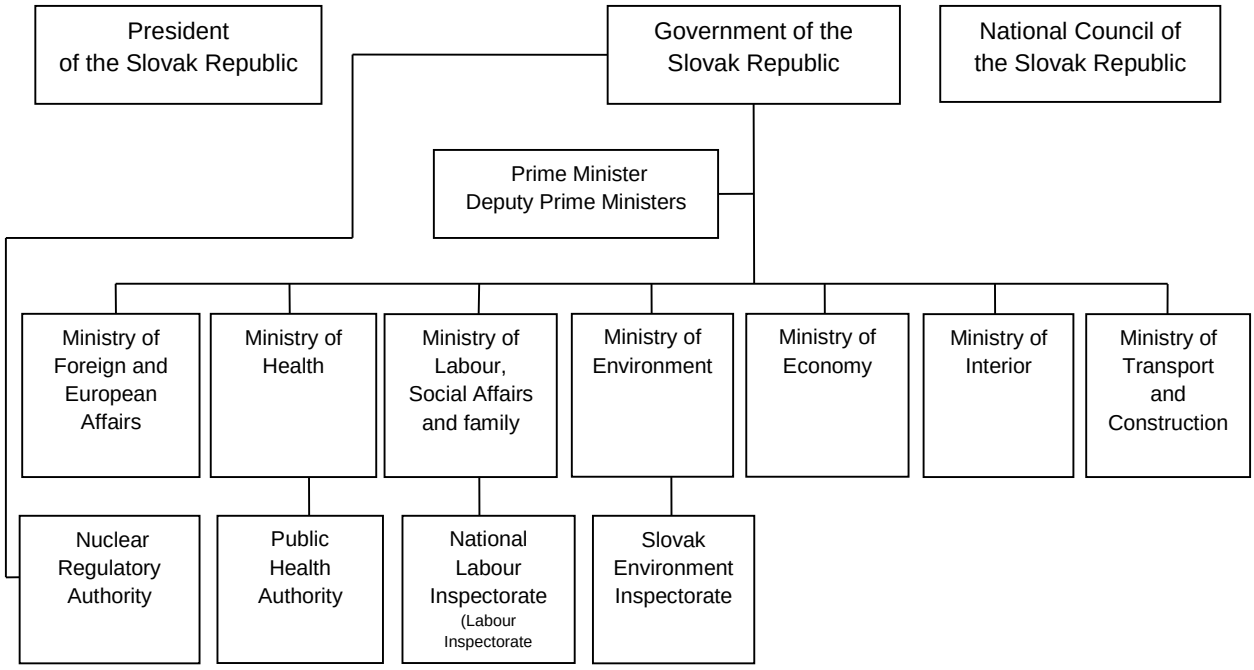


Fig. Structure of government / regulatory bodies

Nuclear Regulatory Authority of the Slovak Republic (ÚJD SR)

According to Act. No. 575/2001, ÚJD SR is an independent central state administration authority. It executes state regulatory activities in the field of nuclear safety of nuclear installations, including management of radioactive waste, spent fuel and other parts of the fuel cycle, as well as transport and management of nuclear materials including their control and record keeping system. ÚJD SR also executes regulatory activities in the field of physical protection of nuclear facilities and nuclear materials, which is provided by the licensee. It is responsible for the assessment of goals of nuclear energy program and of quality of the classified equipment, as well as for commitments of the Slovak Republic under international agreements and treaties in the said field.

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

The Ministry of Health of the Slovak Republic is the central authority of the state administration in the field of health care, health protection and other activities within the health care sector. State administration in the field of public health care is carried out by the public health authorities established by Act No. 355/2007 Coll. on the protection, promotion and development of public health and on amendments to certain laws. The state administration in the field of radiation protection is carried out by the radiation protection bodies established by Act No. 87/2018 Coll. on radiation protection and on amendments to certain laws. The competence of the Ministry of Health includes, in accordance with the current knowledge of science on the influence of physical, chemical and biological factors on the public health, establishment of limits and values of permissible stress by these factors, determining the basic directions and priorities in the field of radiation protection and controls their fulfilment.

The Public Health Authority of the SR is the contact point for communication with the competent authorities of other Member States in the field of radiation protection, participates in the national and international programs important for radiation protection. ÚVZ SR performs state supervision over the activities leading to exposure, including the management of spent nuclear fuel and radioactive waste and the release of radioactive substances and radioactively contaminated objects from administrative control. In nuclear facilities and at workplaces which it authorized for operation, it determines the conditions and authorized limits. ÚVZ SR performs the function of the centre of radiation monitoring network and manages its activity, monitors the radiation situation, collects and processes data on the results of monitoring in the Slovak Republic for evaluation of exposure and assessment of the impact of radiation on the health of population. ÚVZ SR determines the reference levels to optimize exposure in an emergency situation or for persistent exposure in the existing exposure situation, and determines the conditions for transition from emergency situation to the existing exposure situation.

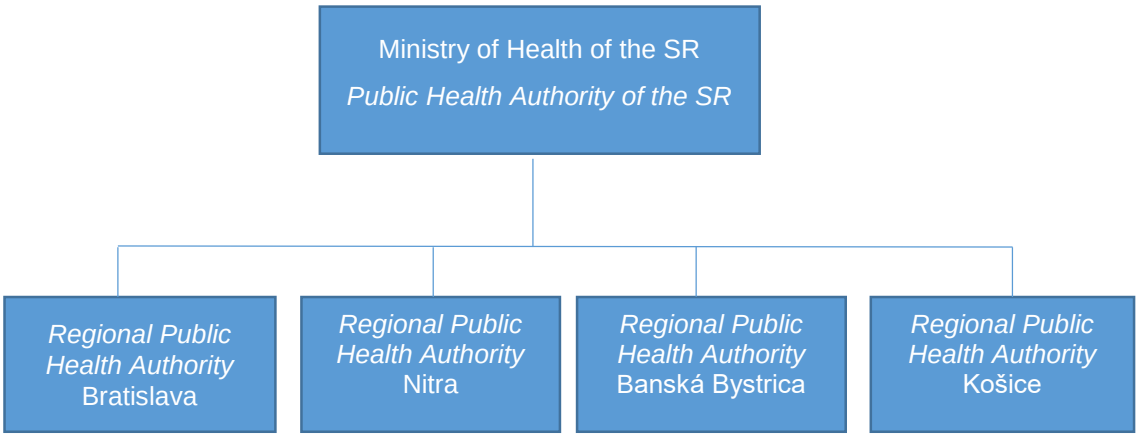


Fig. Structure of state regulation in the field of health protection against radiation

Ministry of Environment of the Slovak Republic (MŽP SR)

MŽP SR is a central body of state administration of the Slovak Republic (inter alia) for the creation and protection of the environment. The following bodies report to the Ministry of Environment:

- The Slovak Environmental Inspectorate, through which MŽP SR fulfils the role of the main state regulator in environmental matters.
- The Slovak Hydro-meteorological Institute and others.

MŽP SR provides, inter alia, the assessment process of strategic documents carried out also under the Protocol on Strategic Environmental Assessment, in conformity with the Convention on the Assessment of Environmental Impacts in a Transboundary Context (Espoo Convention). MŽP SR under the Act governs also the procedure on assessment of anticipated impacts on the environment of proposed activities before deciding about their siting or prior to their authorization pursuant to special regulations in accordance with the Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment, the Directive 2014/52/EU amending Directive 2011/92/EU and under the Espoo Convention. The aim of this procedure is to provide high level environmental protection, including health aspects, i.e.:

a) Ensuring thorough consideration of environmental aspects, including health aspects in preparation of policies and legislation;
b) Setting clear, transparent and effective procedures for strategic environmental assessment;
c) Ensuring participation of the public on strategic environmental assessment; and
d) Through this, by subsequent integration of environmental aspects, including health aspects, into measures and instruments proposed for promoting sustainable development.

Ministry of Interior of the Slovak Republic (MV SR)

The Ministry of Interior of the SR, among other things, is the central authority of the state administration for the protection of constitutional order, public order, security of persons and property, integrated rescue system, civil protection and fire protection.

The Ministry of Interior of the SR fulfils the role of a national contact point for the reception and transmission of warning messages, information messages and messages with the request for assistance from the European Emergency Response Coordination Centre (EADRCC), the national contact points of neighbouring and contracting states, international organizations and crisis management bodies of the Slovak Republic, coordinates the operation of crisis management bodies within the scope determined by the government in preparation for crisis situation and its resolution and the activity of businesses and legal entities in the field of civil emergency planning, proposes to the government the request or provision of humanitarian aid, and provides for the operation of the Central Crisis Staff. The Head of the Central Crisis Staff is the Minister of Interior of the Slovak Republic. In case of accidents at a nuclear installation, it is involved in management and carrying out rescue works, organizes and provides for the operation of the notification and warning centre of the Slovak Republic, development, operation and maintenance of information systems for collection of radiation data, operation of the integrated meteorological system, etc. It provides for a 24 hours permanent service, which fulfils the role of the national contact point of the Slovak Republic vis-à-vis the International Atomic Energy Agency in Vienna and a competent body of the European Commission (ECURIE) in Luxembourg.

Ministry of Economy of the Slovak Republic (MH SR)

The Ministry of Economy of the Slovak Republic is a central state administration authority for, amongst others, nuclear energy industry, including the management of nuclear fuel, storage of radioactive waste, prospecting and exploration of radioactive raw materials and their extraction.

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 a central state administration authority for, among others, safety and health protection at work and labour inspection. State administration on labour inspection is executed by state administration bodies MPSVR SR, the National Labour Inspectorate and labour inspectorates.

MPSVR SR oversees and controls the National Labour Inspectorate and is responsible for the execution of labour inspection. The National Labour Inspectorate is a governing body for labour inspectorates, which performs supervision of compliance with laws and other regulations to ensure safety and protection of health at work at the workplaces (including nuclear installations) in accordance with Act No. 125/2006 Coll. on labour inspection.

Ministry of Transport and Construction of the Slovak Republic (MDV SR)

The Ministry of Transport and Construction of the SR is the central state administration authority for rail, road, water and air transport, electronic communication, postal services, tourism and construction. At the same time, it is also a body for radiation protection in accordance with Section 4 par. 1 d) of the Act No. 87/2018 on radiation protection and the competencies pursuant to Section 8 and 9 of this Act it carries out in the scope of its competence. From the view of radiation protection it issues permits for the transport of radioactive material shipments with activity higher than the activity of classified shipments in accordance with Section 28 par. 7 of the Act No. 87/2018 on the radiation protection

and performs state supervision in the field of radiation protection in the transport of radioactive materials, including transports of nuclear materials (fresh and spent nuclear fuel) and radioactive waste. The Ministry of Transport and Construction of the SR maintains a central register of holders of permits for transport of radioactive materials and register of approved packaging sets.

According to Section 28 par. 15 c) of the Atomic Act, the Ministry of Transport of the SR approves the emergency transport regulations containing measures during incident or accident during transport of radioactive materials, by means of a decision on the approval of the emergency regulation in question.

F.1 Nuclear Safety Regulation - ÚJD SR

ÚJD SR issues various types of decisions: on approval, on license, on authorization, on sanction or measure imposition, on determination of a new licensee, on verification of professional competency, on documentation review and other.

The competence of ÚJD SR is provided in the extensive Section 4 of the Atomic Act (https://www.ujd.gov.sk/ujd/WebStore.nsf/viewKey/AA_541_2004_en/$FILE/At_Act_541_2004.pdf).

ÚJD SR issues annual reports on the status of nuclear safety of nuclear installations and on its activities in the previous year. It presents the report once a year, always by 30 April, to the Government of the SR and subsequently to the National Council of the SR. The annual reports are available at http://www.ujd.gov.sk.

Nuclear Installation Authorization Procedure

The authorization procedure for nuclear installation consists of 5 major stages: siting, construction, commissioning, operation and decommissioning. Before granting an authorization for operation, the regulatory authority carries out inspection under the approved schedule of particular stages of nuclear installation commissioning (testing, fuel loading, physical start up, energetic start up, trial operation) The main regulatory authorities and the authorization procedure for construction operation decommissioning are shown in picture.

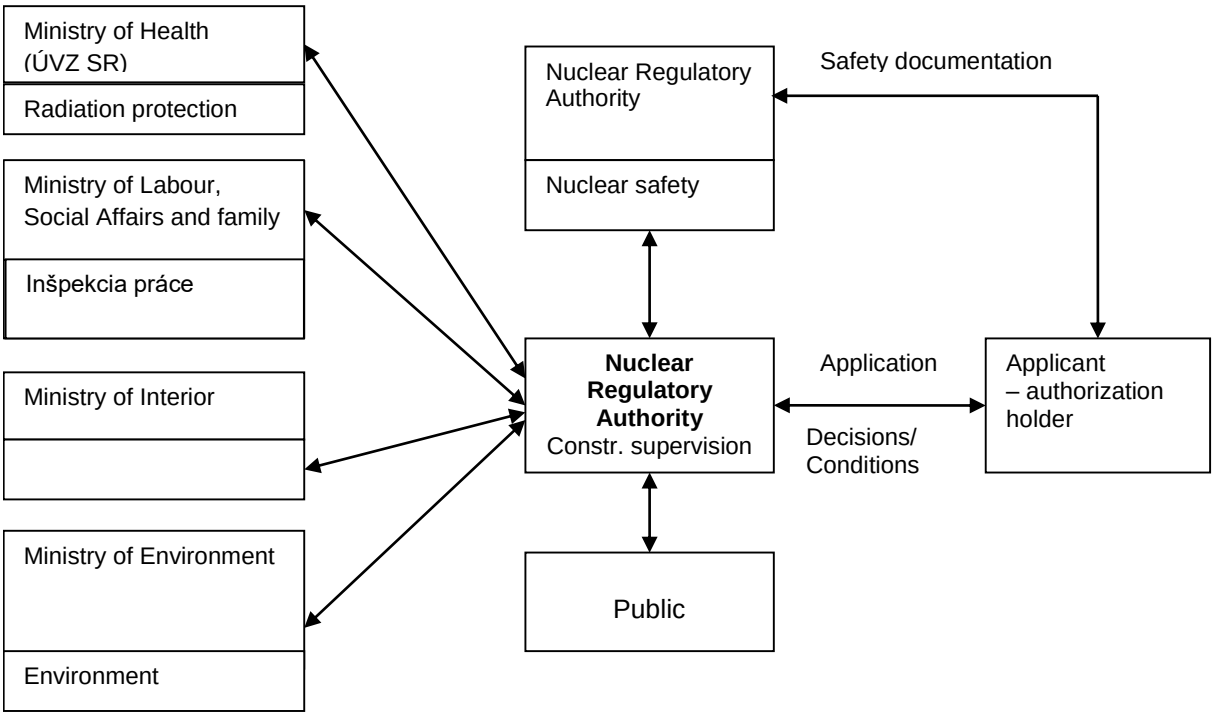


Fig. Authorization procedure

The basic conditions for authorization is the elaboration and submission of safety documentation listed in the annexes of the Atomic Act, necessary for issuance of particular types of decisions and for meeting the legislative requirements for nuclear safety. An essential criteria is also the fulfilment of conditions of preceding approval procedures and decisions of regulatory authority.

Decision about siting of nuclear installation is issued by the affected Municipal Office depending on the site of planned construction of NI, which decides based on the approval issued by ÚJD SR, ÚVZ SR and positions of other regulatory authorities (Labour Inspection authorities, etc.) Authorization to construct a nuclear installation, permit for early use of a building (part of it is also authorization for commissioning of a nuclear installation), approval for temporary use of the construction (part of it is authorization for trial operation) and the decision on final approval of the building (including license for operation of a nuclear installation) issued by ÚJD SR as a building authority. ÚJD SR exercises its competence as an building authority and state administration authority for nuclear safety at the same time in one and the same proceedings, in which its decisions are based on its own partial decision (partial approval of the safety documentation), as well as based on opinions from the relevant regulatory bodies – the Public Health Authority of the SR (radiation protection), the National Labour Inspectorate (labour inspection and occupational health and safety) and other bodies and organizations of state administration (fire protection, civil protection). When issuing authorizations and licenses by the Nuclear Regulatory Authority of the SR, the obligations of ÚJD SR and of other affected bodies are defined by the Act No. 50/1976 Coll. (the Construction Act) as amended, the Atomic Act, the decree of ÚJD SR No. 430/2011 Coll., setting the details of requirements for nuclear

safety of nuclear installations during their siting, design, construction, commissioning, operation, decommissioning and closure of repository, as well as criteria for classification of selected equipment into safety classes, decrees of the Ministry of Environment of the SR No. 453/2000 Coll. and No. 55/2001 Coll. and the Decree of MPSVR SR No. 508/2009 Coll. The licensee is liable for nuclear safety.

Documentation, attached to the application for issuance of certain decisions of ÚJD SR and essential for submission, is listed in the Annexes No. 1 and 2 to the Atomic Act. Details concerning the scope, content and the method of preparation of documentation are defined in the ÚJD SR Decree No. 58/2006 Coll. as amended by the ÚJD SR Decree No. 31/2012 Coll.

In 2011, by amending the Atomic Act, the license for operation of all nuclear installations is valid for unlimited period of time (before it was limited to 10 years).

Regulatory Methods to Verify Operator's Compliance with Authorization Conditions

Inspections

The tasks in the field of state regulation are exercised by ÚJD SR´s nuclear safety inspectors. During the fulfilment of their tasks, the nuclear safety inspectors follow ÚJD SR´s internal directive "Inspection Activity of ÚJD SR". The Directive sets a uniform procedure for inspections, for processing and assessment of annual inspection plans, for management of ÚJD SR´s inspection program, for processing of documentation of inspection activities, and for analysis of ÚJD SR´s inspection activities.

Inspection plan is a tool for continuous and systematic evaluation of inspection activities at nuclear installations and during transports and controls of nuclear materials. As a rule, such plans are developed for the period of one year and they cover in a complex way all areas of regulation of nuclear safety.

Inspections follow inspection procedures that are part of the ÚJD´s Inspection Manual. For inspection activities with no developed inspection procedures, individual inspection procedures are conducted.

Types of Inspections

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

Planned Inspections:

By routine inspections, the nuclear safety inspector verifies the assurance of compliance with requirements and conditions of nuclear safety, conditions of the installation, compliance with approved limits and conditions and with selected operational provisions. Routine inspections are performed mainly by site inspectors at the corresponding installation. In case of inspection, focus of which exceeds the professional competencies of the site inspector, inspection is performed by nuclear safety inspectors from the Department of Safety Evaluation and Inspection Activities and Department of Regulatory Activities and International Relations of ÚJD SR. Routine inspections follow the procedures contained in the Inspection Manual.

Special inspections are performed by nuclear safety inspector in accordance with the basic inspection plan. Special inspections focus on specific areas, in particular on the verification of compliance with the requirements and conditions of regulation pursuant to section 31 of the Atomic Act.

Special inspections normally follow procedures contained in the Inspection Manual.

Team inspections focus on the verification of compliance with requirements and conditions of regulation pursuant to section 31 of the Atomic Act, normally within several areas in parallel. Team inspections are planned for areas selected on the base of long-term assessment of operator's results emerging from the analyses of inspection activities. Team inspection is an inspection, in which several departments participate.

Unplanned Inspections:

Unplanned inspections are performed by nuclear safety inspectors as routine, special or team inspections. These inspections respond to the conditions at the NI (for example, commissioning phases) or events at NI. ÚJD SR thus responds to the situation at NI.

Rules valid for all types of inspections:

- inspections are announced in advance. However, they can also be unannounced, if their focus and nature requires to do so,
- the corresponding site inspector is notified in advance of the inspection. Generally, the site inspector participates in the inspection,
- any inspection performed by more than a single inspector has a head of inspection team appointed.

Inspection Protocol

Every performed inspection must be documented in a form of a protocol or a record. Binding measures to repair the detected findings are included in the protocol. They must be formulated clearly so as to impose the responsibility to eliminate detected deficiencies, and must be comprehensible with unambiguously set deadlines for their fulfilment.

Analysis of Inspection Activity

Analysis of inspection activity comprises statistical evaluation of the findings. The objective of the statistical evaluation is to determine the distribution and the frequency of inspection findings. Based on the evaluation of the trends of the inspection findings, it is possible to modify the inspection plan for the upcoming period, particularly in those areas where the most deficiencies have been identified.

Sanction

Pursuant to authorization for operation and RAW management, the requirements and conditions of nuclear safety approved and introduced by the regulatory authority are monitored. The regulatory body may impose fines to the operator, as well as to his employees, when nuclear safety is violated. In case of non-observance of requirements and violation of legal provisions, regulatory body is entitled to impose sanctions including financial fine to the authorization holder.

Financial and human resources of the regulatory body - ÚJD SR

The budget Chapter of ÚJD SR is linked to the state budget with its revenues and expenditures. Since 1 January 2008, annual contributions for execution of state regulation in nuclear safety have been introduced into the legal order of the SR. 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 to secure 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.

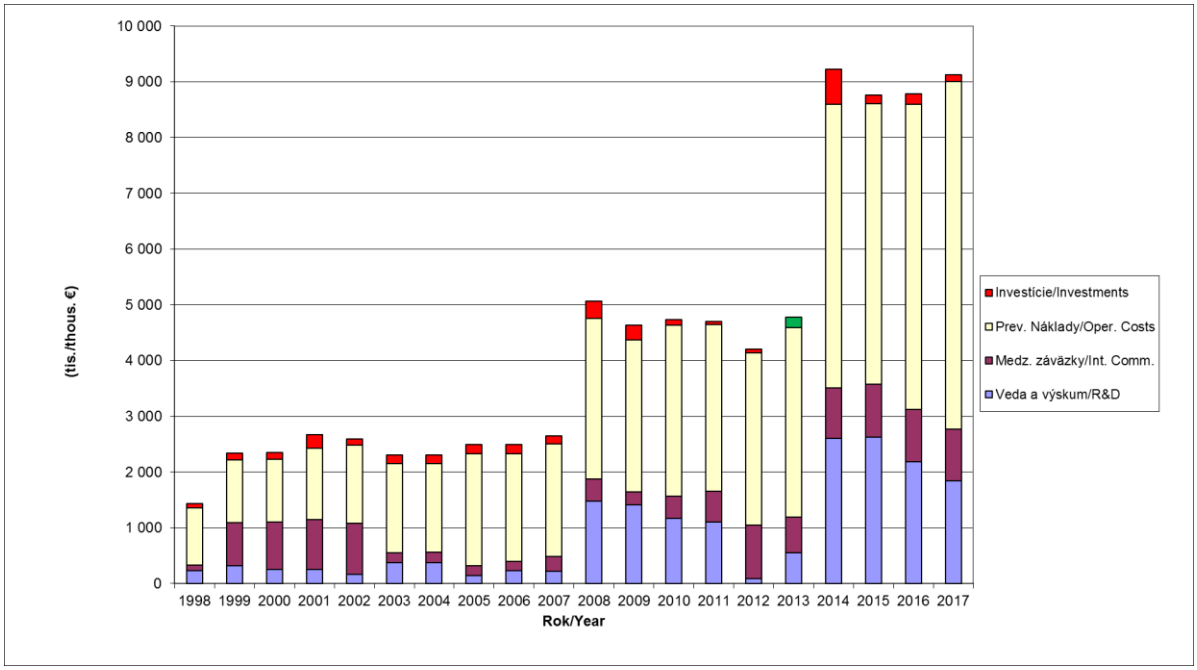


Fig. Structure of the budget chapter

The *2017* budget breakdown for ÚJD SR stipulated a determined total number of employees *126* of which *110* are civil servants and *16* employees working in public interest.

F.2 Regulation in the Field of Radiation Protection

Under Act No. 575/2001 Coll. the Ministry of Health of the SR (MZ SR) is the central state administration authority for health care, health protection and other activities in the health care sector.

The state administration in the field of radiation protection according to Section 4 of the Act No. 87/2018 Coll. on radiation protection, is performed by the radiation protection authorities, namely:

- Ministry of Health of the SR,
- Public Health Authority of the SR,

- Regional public health authorities,
- Ministry of Transport and Construction of the SR,
- Ministry of Defence of the SR,
- Ministry of Interior of the SR and
- Slovak Information Service.

The scope of competence of the Ministry of Health of the SR includes, inter alia, setting limits of exposure and conditions for the management of radioactive waste in terms of their possible impact on public health.

Supervision of radiation protection in the SR is ensured by state supervision pursuant to Section 155 of the Act No. 87/2018 Coll. on radiation protection. The state supervision authority in nuclear facilities is the Public Health Authority of the SR. The state supervision authority for the transport of radioactive materials outside the premises of the nuclear facility is the Ministry of Transport and Construction of the SR.

The Public Health Authority of the SR issues various types of decisions, binding opinions, guidelines for elimination of deficiencies found, directives, recommendations, instructions and expert guidelines in the field of radiation protection.

The scope of competence of the Public Health Authority of the SR in the area of radiation protection is anchored in Section 6 of Act No. 87/2018 Coll. on radiation protection (https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2018/87/20180401).

Every year, the Public Health Authority of the SR develops activity reports of ÚVZ SR, which can be found at http://www.uvzsr.sk/index.php?option=com_content&view=category&layout=blog&id=25&Itemid=34.

The Public Health Authority of the SR performs both permanent and continuous state supervision over radiation protection in nuclear facilities and workplaces, where activities are carried out for which it has issued permit, it determines the conditions for performing activities leading to exposure, services important for radiation protection and release of radioactive substances and radioactively contaminated objects and materials under administrative control, determines conditions and authorized limits in nuclear facilities and workplaces for which it issued permit. ÚVZ SR determines the reference levels for the optimization of radiation protection in the emergency radiation situation or for the persistent exposure in the existing exposure situation, conditions for transition from emergency exposure situation to the existing exposure situation and proposes strategy for managing the existing exposure situation. It monitors and guides radiation exposure of workers by checking compliance with the exposure limits and controls the rationale of activities leading to exposure, checks compliance with the limit dose of a representative person for the design, construction and operation of nuclear facility for radioactive discharges into the atmosphere and hydrosphere, evaluates radioactive contamination of individual components of the environment, evaluates the health condition of the population in near and wider neighbourhood of workplaces with sources of ionizing radiation.

In the field of radiation protection, the Public Health Authority, among other things:

- Orders measures to prevent the emergence of diseases and other health problems due to exposure to ionizing radiation;
- Monitors radiation situation and data collection on the territory of the Slovak Republic for the purpose of assessing exposure and influence of the exposure on public health and creates, provides for and manages the activities of the radiation monitoring network;
- Maintains a register of activities leading to exposure, for which it issued permit and activities leading to exposure that it registered on the basis of notification;
- Maintains a central register of sources of ionizing radiation and central register of doses and issues personal radiation cards to external staff;
- Provides expert guidance and information to persons who have come into contact with radioactive source or have been exposed to ionising radiation;
- Provides information to the public on the radiological situation, emergencies and possible exposure, on the risks posed by exposure and on measures and interventions to reduce radiation exposure in radiation accidents;
- Searches for workplaces and facilities, where abandoned radioactive sources can occur;
- Sets up a test committee for the examination and recognition of professional competence,
- Establishes a commission that assesses the compliance with the requirements for recognition of competence of a natural person or a legal entity to work as a radiation protection expert,
- Cooperates with the European Commission and the competent authorities and institutions of the Member States and represents the Slovak Republic in international organizations in radiation protection cases.

Authorization Procedure

The Public Health Authority of the SR, when authorizing an activity leading to exposure or authorizing a service important in terms of radiation protection, proceeds pursuant to Act No. 71/1967 Coll. on administrative procedure as amended. The basic prerequisite for issuing an authorization is the submission of the required documentation and the fulfilment of the requirements laid down in the Act No. 87/2018 Coll. on radiation protection.

Authorization of ÚVZ SR for activities leading to exposure in relation to nuclear facilities is not the final granting of a license, but it is a condition for issuing a license.

Supervision methods to verify compliance by the licensee

State supervision in nuclear facilities is carried out by the staff of ÚVZ SR and supervision in transport outside the nuclear facility is carried out by the staff of MDV SR.

The person performing state supervision is, among other things, authorized to enter the land, premises, facilities and operations and other areas of supervised entities, to require the necessary accompaniment, to take samples in the amount and to the extent necessary for the analysis and to carry out their expert assessment, to request the necessary information, documentation, data and

explanations, accompanying documents, technical and other documentation, to impose measures to eliminate identified deficiencies, and sanctions. The person exercising state supervision may, for example, prohibit the use of instruments and equipment that are imminently hazardous to health, order the closure of a facility or part thereof, if it detects a risk of harm to the health, order the implementation of a measure to limit the exposure of staff and residents, order safe disposal of unused or damaged sources of ionizing radiation, radioactive waste or radioactive substances, to order the development of special operating rules, working procedures and methodologies for carrying out activities leading to exposure, to prohibit activities or operations, to order special measurements, analyses or examinations for the purpose of assessing harmful factors and their impact on health. Supervision of the provision of radiation protection in activities leading to exposure and services important in terms of radiation protection is carried out primarily by assessing the proposal for activities leading to exposure or the provision of a service important for radiation protection at the stage of its authorization and then continuously according to the nature of the risk it represents.

Radiation protection authorities perform state supervision on the basis of a pre-planned review plan, which is updated once a year. In its preparation and update, a graded approach is applied, taking into account the extent and nature of the risk associated with the activity that is subject to supervision. Such reviews can be done also as unscheduled.

The system of monitoring compliance with radiation protection obligations and requirements as laid down in the legislation and compliance with the conditions and obligations set out in the authorization to conduct the activity leading to exposure is ensured primarily by a system of targeted on-site checks, but a very effective tool and source of information is also a comprehensive system of reports, information and notification on the situation at a nuclear installation, about the exposure of workers, about emergency incidents and on the management of radioactive waste that the licensee must provide on a continuous basis in writing or electronic form to the regulatory authority within the deadlines specified in the license.

The on-site inspection shall in particular check:

- The current state of radiation protection,
- State of the equipment,
- Compliance with the regimes,
- State of the monitoring systems, fulfilment of the monitoring plan and records on the results,
- Documentation on the operation,
- Documentation on radiation protection,
- Operating rules,
- Records of deviations, results of investigating incidents.

On-site inspections include taking control measurements of radiation situation and taking control samples by the staff performing supervision.

The checks are mostly focused on a special area important in terms of radiation protection:

- Control of radiation protection during reactor power operation,

- Control of radiation protection during general outage,
- Control of monitoring of discharges, registration of data and assessment of their impact on the dose load on the population,
- Control of implementation of a system and application of ALARA principle,
- Checking the health and professional competence of staff,
- Control of radioactive waste management,
- Control of system to release contaminated materials from administrative control, including control of storage places for such material,
- Control of fulfilment of monitoring plan in the vicinity of a nuclear installation and assessing the impact of operation of a nuclear facility on the radioactivity of components of the environment,
- Control of radiation situation within the premises of a nuclear facility,
- Checking the preparedness to emergency situations and their material provision, inspection of shelters, gathering areas and checking protection of staff in the areas of forced stay during accidents,
- Control of fulfilment of the traumatological plan, etc.

Further reviews are carried out according to the need:

- Transport of radioactive materials,
- Events, incidents and accidents,
- Participation in emergency exercises.

Each review carried out must be documented in a form of a record. Binding measures to remedy the deficiencies form part of the record. They must be clearly formulated so as to impose the elimination of deficiencies found and understandable with clear deadlines for fulfilment.

Financial and human resources of the competent supervisory authorities for radiation protection

In the exercise of its competence, the radiation protection authorities use the human and financial resources necessary to fulfil their obligations according to Act 87/2018 Coll. on radiation protection depending on the state budget resources; in order to support its supervisory functions, radiation protection authorities may use external scientific knowledge and technical resources and expertise.

ÚVZ SR is a budgetary organization of the state which is connected with its financial relations to the budget of the Ministry of Health. In 2017, the radiation protection authorities in the health care sector (ÚVZ SR and regional public health authorities) had a total of 30 employees.

MDV SR is a state administration body with a specified budget chapter of the public administration. The total number of employees of the ministry entrusted with the state oversite in the field of radiation protection in 2017, was 2.

F.3 Regulation in the Field of Occupational Health and Safety

Role of the Regulatory Authority

State administration in the field of labour inspection is executed by:

a) Ministry of Labour, Social Affairs and Family of the Slovak Republic;
b) National Labour Inspectorate;
c) Regional Labour Inspectorate Nitra, it oversees compliance with the legal regulations and other regulations to ensure occupational health and safety at the workplaces of a nuclear installation on the whole territory of the Slovak Republic.

Labour inspection means:

a) Supervision of compliance (among others) with:
   1. employment regulations governing labour relations;

   2. legal regulations and other regulations to ensure occupational health and safety, including regulations governing factors of working environment;

   3. legal regulations which regulate the ban on undeclared work and illegal employment,

   4. obligations arising from collective agreements and other;

b) Drawing liability for breaches of regulations contained under letter a);
c) Providing free advice to employers, natural persons as entrepreneurs, but not employers, and to employees within the scope of basic expert information and advice on ways how to effectively comply with the regulations contained under a).

Obligations of the operator of nuclear installations, legal entities and natural persons vis-à-vis bodies of labour inspection arise from the Act No. 124/2006 Coll. on occupational health and safety, Act No. 125/2006 Coll. on labour inspection and the implementing regulations to the given acts (listed in Annex V.).

Activity of the Labour Inspectorate Nitra

Labour Inspectorate Nitra ensures labour inspection to the extent as provided by the Act No. 125/2006 Coll. and oversees in particular whether the following conform to the requirements of labour protection:

- Selection, location, arrangement, use, maintenance and control of the workplace, working environment, work equipment;
- Workflows, working time, organization of labour protection and system of its management;
- Investigates the causes of an industrial accident which has caused death or serious injury, the causes of major industrial accident, safety, technical and organizational causes of occupational disease and the risk of occupational disease, keeps their records and if necessary, investigates the causes of the occurrence of other work accidents,
- By means of binding opinion imposes requirements for ensuring safety and protection of occupational health when licensing and approving structures and their changes,

- Withdraws authorization, certificates, licenses issued or documents to a natural person or a legal entity for performing activity according to special regulations;
- Discusses offences, takes decisions on imposing fines for offences and on ban of activity according to special regulations.
- Verifies compliance with the scope and conditions of authorizations, certificates and licences issued under this law and special regulations,
- Decides to impose fines under Sections 19 and 20 and under special regulation.

Within the scope of competencies given by the Act No. 125/2006 Coll. on labour inspection, the Labour Inspectorate Nitra performs supervision at all workplaces of nuclear facilities in the Slovak Republic.

The Labour Inspectorate is independent in performing labour inspections and executes labour inspections through labour inspectors.

Besides the classic work of labour inspections the Labour Inspectorate Nitra also performs labour inspections relating to the condition of occupational health and safety, including the safety condition of the technical equipment - pressure, lifting, electrical and gas - in accordance with the decree of the Ministry of Labour, Social Affairs and Family of the Slovak Republic No. 508/2009 Coll., providing for the technical equipment that is considered as classified technical equipment. It also carries out labour inspection on the technical equipment which are designated products after their placement on the market or making available on the market or after their putting into service.

According to the degree of risk, the types of technical equipment are divided into group A, group B or group C. “Group A” contains technical equipment with high degree of threat, “Group B” are technical equipment with higher degree of threat and “Group C” are technical equipment with lower degree of threat. Technical equipment of Group A and technical equipment of Group B are considered as classified technical equipment.

Methods of supervision by the labour inspection body

During inspection, the labour inspector is authorized especially to:

- Enter freely and at any time the premises and the workplaces that are subject to labour inspection under the terms of the relevant regulations concerning workplaces of nuclear installations;
- Perform control, test, investigation and other acts aimed at establishing whether the regulations to ensure occupational health and safety are complied with;
- Request documents, information and explanations relating to application of regulations to ensure occupational health and safety;
- Request submission of documentation, records or other documents necessary for labour inspection purposes and to request copies thereof;
- Take the necessary samples of materials or substances that are used or which are being handled, for the purposes of analysis;
- Require proof of identity from an individual being at the workplace of an employer and to ask for explanation for the presence.

Based on the results of labour inspection and the severity of facts found, the labour inspector is entitled (among others) to:

- Propose technical, organizational and other measures necessary to remedy the situation,
- Order removal of identified deficiencies within the time limits specified,
- Order measurements, inspections, tests and other necessary measures,
- Impose fines for offences under special regulation and other.

The Nitra Labour Inspectorate is authorized to carry out labour inspection at workplaces of nuclear installations, focusing on to prevent industrial accidents, safety and health at work, the safety of technical equipment, checking relevant documentation, etc.

Based on the results of inspection the labour inspector proposes measures, imposes measures and obligations to adopt measures for removal of breaches of regulations found and their causes and an obligation to submit to the Labour Inspectorate Nitra information on fulfilment of measures to remove the breaches of regulations found and their causes.

F.4 International Cooperation

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 focusing on nuclear safety review, in the health service, on evaluation of material degradation of primary circuit components, etc. are taking place.

Significant part of regional projects related is 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.

The self-assessment of ÚJD SR following the methodology of the Integrated Regulatory Review Service (UN/IAEA) carried out by ÚJD SR in 2011 was reviewed by the IRRS mission in 2012.

The mission visiting the SR reviewed the following 11 areas:

- Government responsibilities and functions,
- Global nuclear safety regime,
- Responsibilities and functions of ÚJD SR,
- Management system,
- Issuing authorizations/licenses,
- Safety review and assessment,
- Conducting inspections,
- Law enforcement,
- Development of laws, decrees and guides,
- Emergency preparedness and response,
- Consequences of the accident at the nuclear power plant at Fukushima.

The IRRS mission confirmed a high level of regulation. It highlighted the work that has been done so far at ÚJD SR and ÚVZ SR, and the enthusiasm of their employees. Conclusions from the mission were categorized as proposals for improvements and recommendations, which ÚJD SR transposed into the Action Plan to address the measures resulting from the IRRS mission.

By conducting self-assessment and the follow-up IRRS mission and by implementing the Action Plan for improvements, the activity of ÚJD SR shall become more effective, and increase the efficiency in providing services and meet the legitimate needs and requirements of the stakeholders. The relevant provisions of the Atomic Act, the requirements of the Council Directive 2009/71/EURATOM, the IAEA and internal normative acts of the ÚJD SR shall be met. At the same time it shall contribute to the fulfilment of the National Quality Program of the SR. The Action Plan for strengthening the regulatory framework was approved by the Government in November 2012.

The follow-up mission, aimed at controlling the performance of the Action Plan of improvements, should take place in February 2015.

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

Representatives of the SR attended the government experts meeting on third party nuclear liability, 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 attend meetings of expert groups of the EU Council and the European Commission on a regular basis with the aim to exchange knowledge on reviews of the level of nuclear safety of nuclear installations in Europe. 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 of reactors 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.

G LICENCE HOLDERS (art. 7)

1. *Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities rest with the licence holder. That responsibility can not be delegated.*

2. *Member States shall ensure that the national framework in place require licence holders, under the regulatory control of the competent regulatory authority, to regularly assess, verify and continuously improve, as far as is reasonably achievable, the safety of the radioactive waste and spent fuel management facility or activity in a systematic and verifiable manner. This shall be achieved through an appropriate safety assessment, other arguments and evidence.*

3. *As part of the licensing of a facility or activity the safety demonstration shall cover the development and operation of an activity and the development, operation and decommissioning of a facility or closure of a disposal facility as well as the post- closure phase of a disposal facility. The extent of the safety demonstration shall be commensurate with the complexity of the operation and the magnitude of the hazards associated with the radioactive waste and spent fuel, and the facility or activity. The licensing process shall contribute to safety in the facility or activity during normal operating conditions, anticipated operational occurrences and design basis accidents. It shall provide the required assurance of safety in the facility or activity. Measures shall be in place to prevent accidents and mitigate the consequences of accidents, including verification of physical barriers and the licence holder's administrative protection procedures that would have to fail before workers and the general public would be significantly affected by ionising radiation. That approach shall identify and reduce uncertainties.*

4. *Member States shall ensure that the national framework require licence holders to establish and implement integrated management systems, including quality assurance, which give due priority for overall management of spent fuel and radioactive waste to safety and are regularly verified by the competent regulatory authority.*

5. *Member States shall ensure that the national framework require licence holders to provide for and maintain adequate financial and human resources to fulfil their obligations with respect to the safety of spent fuel and radioactive waste management as laid down in paragraphs 1 to 4.*

G.1 Responsibility of the Licensee

The authorization holder according to the Atomic Act is obliged to establish the necessary organizational structure, to define the responsibilities, professional competencies, procedures and resources to ensure quality of nuclear installations and general safety provisions. In compliance with the Atomic Act, the authorization holder is obliged to ensure nuclear safety, physical protection, emergency preparedness, including their verification, to comply with the documentation reviewed or approved by the Nuclear Regulatory Authority of the SR, to adhere to the limits and conditions of safe

operation or limits and conditions of safe decommissioning. Further he is obliged to comply with the technical and organizational requirements provided by the generally binding legal regulations.

The authorization holder may authorize performance of work activities only to persons meeting the conditions set in Section 24 of the Atomic Act and in compliance with the Decree No. 52/2006 Coll. of the Nuclear Regulatory Authority of the SR on professional competence, shall identify all job positions, where working activities are being performed that have impact on nuclear safety, and other job positions with direct impact on nuclear safety together with a description of work activities in the documentation of the quality system.

Principles and Definition of Nuclear Safety and Radiation Protection

Under the Atomic Act, nuclear safety shall mean the technical status and ability of a nuclear installation or transport equipment and the status and ability of its staff to prevent the uncontrolled development of a fission chain reaction or the unsanctioned release of radioactive substances or ionising radiation into the workplace environment or the natural environment and the ability to limit the consequences of incidents and accidents at nuclear installations or consequences of nuclear events during shipment of radioactive materials.

The authorization holder shall be liable for nuclear safety.

Radiation protection, in accordance with the Act No. 87/2018 Coll. on radiation protection, is defined as a system of technical or organizational measures to limit the exposure of individuals to the effects of ionizing radiation.

The license holder is obliged to observe the basic principles of radiation protection, requirements to ensure radiation protection of staff and residents during activities leading to exposure and to limit generation of radioactive waste to the necessary extent.

A level of nuclear safety, reliability and health protection at work and safety of technological facilities, radiation protection, psychical protection, emergency preparedness and fire protection must be achieved upon using nuclear energy so as to keep the life, health, working or environment-related hazards as low as reasonably achievable according to the available state-of-the-art knowledge; at the same time, exposure limits shall not be exceeded. Upon new significant information being obtained about the risk and consequences of the use of nuclear energy, the above-mentioned level must be reassessed and necessary measures shall be taken to meet the conditions pursuant to the Atomic Act.

In the SR it is possible to dispose only radioactive waste that is produced in its territory.

In case of shipments of radioactive waste and spent nuclear fuel produced on the territory of the SR, for treatment or reprocessing in a Member State or a third country, the ultimate responsibility for safe disposal of these materials, including waste, which is generated as a by-product, is the Slovak Republic.

Radioactive waste produced in the SR can be disposed in another Member State or a third country only on the basis of an international treaty concluded between the SR and that other state or a third

country, which will enter into force no later than at the time of shipment of radioactive waste and which takes into account the recommendations of the European Community for Atomic Energy, under the conditions contained in the Atomic Act *in accordance with the provisions of Sections 16 to 16.1),* Section 21 par. 13).

Policy of Nuclear Safety and Radiation Protection

The purpose of the safety policy of nuclear installations for operators is to set safety goals, requirements, fundamentals, principles, responsibility, measures and methods of their performance for all areas of safety, such as nuclear safety and radiation protection, environmental safety, operational safety, technical safety, construction and physical safety, occupational health and safety and fire protection, safety of integrated system and telecommunication network, classified information protection, emergency planning and civil protection, personal safety, administration safety, financial safety, protection of company´ reputation and planning of activity continuity.

The policy of safety is pursued by internal acts as well as by inspection of their observance across all levels of company management.

Compliance with and fulfilment of the safety policy content by all employees is one of the main priorities and objectives; Safety is an integral part of all activities.

The following main requirements, fundamentals and principles of nuclear safety and radiation protection are set to achieve the safety goals:

- Nuclear safety and radiation protection is overriding and superior over any other interests of the company.
- Every employee is responsible for nuclear safety and radiation protection in the scope of his competencies, responsibilities and duties.
- The principles of safety culture apply in all activities relating to nuclear installations.
- Principles of defence in-depth strategy: multi-level, mutually overlapping measures, focused mainly at prevention, but also at accident mitigation, are applied in nuclear installation designs and activities related to the operation of nuclear installations.
- Systems and components of relevance to safety are periodically tested with the aim to verify their functionality and serviceability.
- Safety audits of the respective safety systems are conducted on a periodical basis.
- Integrated management system is developed in line with the requirements of the Slovak legal order, of regulatory authorities, of IAEA recommendations and of the requirements of STN EN ISO 9001:*2015*, STN EN ISO 14001:*2015*, STN OHSAS 18001:2007 a STN ISO/IEC 20000-1:2008 standards.
- The latest knowledge and experience from operation of nuclear installations in the country and abroad are utilized at all times.

- International assessments and reviews are regularly used for independent assessment of nuclear safety and radiation protection level.
- An open dialogue with the public, local and regional state administration and self-governing authorities is applied.
- Currently occurring safety risks concerning nuclear safety and radiation protection are identified, analysed, classified, and managed across all management levels. More serious hazards are submitted to the Nuclear Safety Committee, an advisory body of the top management of the operator.
- Operators invest adequate material and financial means to deliver the safety goals and meet the safety requirements, fundamentals and principles of nuclear safety and radiation protection, and to improve education and qualification of employees.

The primary responsibility for nuclear safety and radiation protection is with the specific persons listed as statutory body of the licensees (Boards of Directors in case of joint stock companies), who determine and pursue the application of the main goals, requirements, fundamentals and principles of nuclear safety and radiation protection in all activities related to the nuclear installations, from their siting, design, construction, commissioning, operation until decommissioning, including management of spent nuclear fuel and radioactive waste. The obligations following the primary responsibility are delegated to the executive management through authorization of persons and the description of the organizational rules of the company.

G.2 Safety assessment

G.2.1 List and Description of Spent Fuel Management Facilities

ISFS of JAVYS, a. s.

BASIC TECHNICAL DATA FOR ISFS - JAVYS, a. s.	
Maximal storage capacity	14,112 fuel assemblies
Storage capacity as at 31 December 2017	13,980 fuel assemblies
Number of pools	3 operational + 1 backup
Ground-plan of the building	45m x 70m
Total built up area	95,000 m^3
Possibility of extending it	Two stage extension with dry technology for SNF storage, using storage containers (canisters)
Method of storage	KZ 48 baskets, T-13
Maximal temperature of pool water	50 °C

Capacity of purification system of pool water	25 m^3/h
Method of transportation of spent fuel	Rail wagons, TK C-30 containers
Pool size, length x width x depth	23.4 x 8.4 x 7.2 m
Number of baskets per pool	98 of KZ-48 type

The ISFS is a nuclear installation intended for temporary and safe storage of spent nuclear fuel from WWER-440 reactors. It is designed as a wet storage. Into operation was put in 1986. Active operation began in 1987.

The ISFS is a standalone building without any construction link to the buildings within the premises of other nuclear installations at Jaslovské Bohunice. The building is divided to container section and storage section. The storage section consists of 4 storage pools with one pool designated as a reserve pool. The storage pools are interconnected with a transport channel. Each pool can be separated from the transport channel with hydro locks. The spent fuel is stored inside baskets located in the pools under water, which at the same time is also a shielding and removes the residual heat from the spent fuel assemblies.

Fig. Pool hall in ISFS

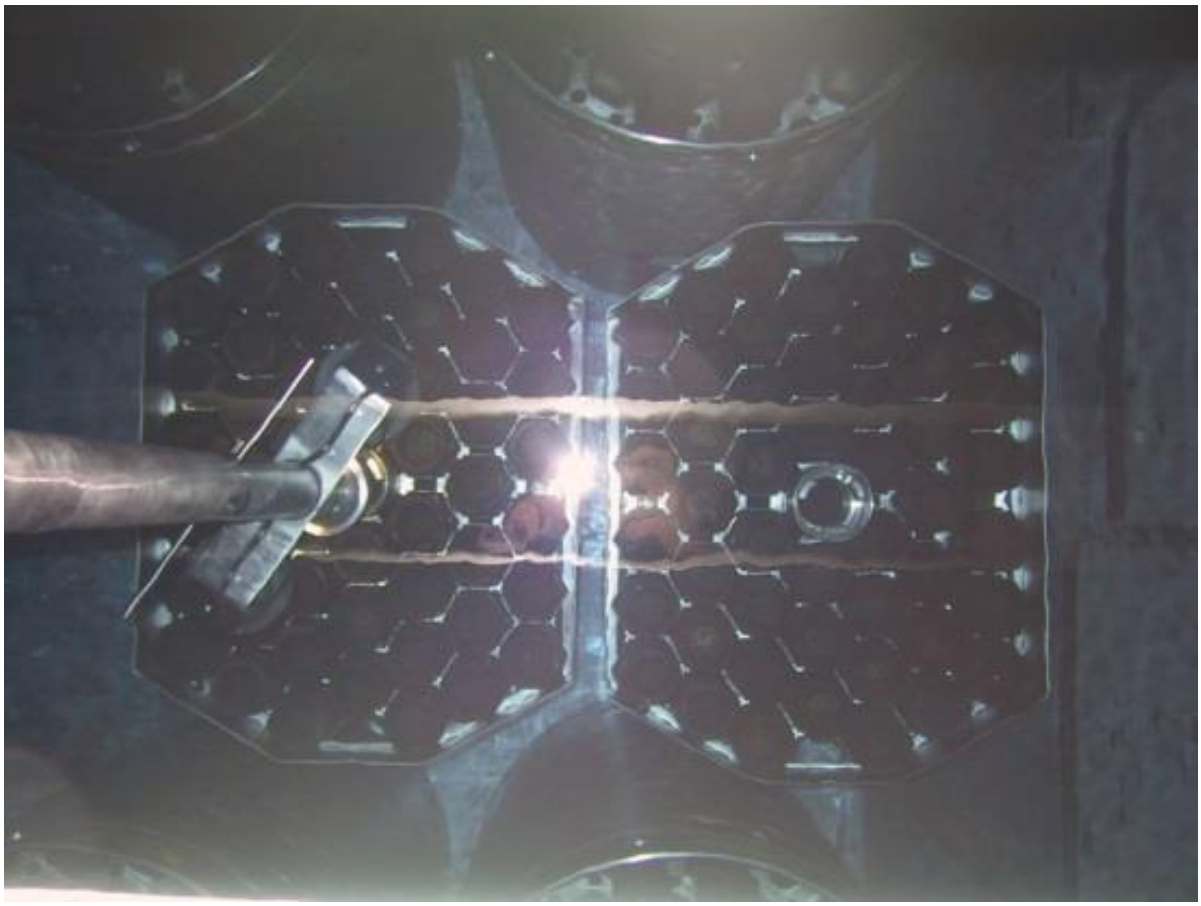


Fig. Spent fuel cask

The pools are equipped with double lining (carbon steel and stainless steel) with an inter-space, from which leaks are draught into the system of leaks.

The ISFS was reconstructed in the period 1997 – 1999 for the purpose of increasing its storage capacity, life extension and enhancing the seismic resistance of the structure. The ISFS has its own **cooling and treatment station**. Due to the increased requirements for the removal of residual heat from the spent fuel (increased fuel burn-up, increased number of SNF) the original cooling system has been replaced by a new system. The overall storage capacity of ISFS after reconstruction and seismic enhancement is nearly three times higher compared to the designed capacity (increase from the original 5 040 to the current 14 112 fuel assemblies).

Part of the reconstruction was also the project of seismic reinforcement of ISFS aimed at increasing the resistance of construction and technological structures. The evaluation revealed the necessary modifications of the building structures and technology that were then carried out in the framework of the project of “Seismic reinforcement and extension of storage capacity of ISFS Bohunice”. By implementing this project the achieved status is that even after a seismic event all safety functions of ISFS will be secured up to the level set for the Jaslovské Bohunice site (8° MSK 64) and its life was extended by minimum 50 years following the finalisation of reconstruction.

Apart from the changes and modifications of the original construction solution and technological equipment of the ISFS, which resulted from the requirements for seismic reinforcement and extension of the storage capacity, further changes and modifications have been made, which increased the safety level of the ISFS, such as:

- Installation of a manipulator MAPP 400 for transferring spent fuel;
- Increasing the capacity of the air-conditioning system of control rooms, ventilation at the entry to the ISFS, modifications to the air-conditioning system,
- Increasing the capacity of the pool water filtration system with a filtration unit to capture micro-organisms in pool water, including disposal of filter inserts,
- Modification of the decontamination system;
- Installation of detection system for fuel assemblies tightness (Sipping in Pool) and monitoring of corrosion on the pools lining;
- Modernization of the system and instrumentation for radiation control of ISFS, etc.

Based on the IAEA document (SSG-15 Storage of Spent Nuclear Fuel) and ÚJD SR Decision No. 152/2000, a **monitoring program** has been progressively implemented since 2001, focusing on:

- Building structures, such as the foundations of the ISFS building, concrete structures of spent fuel pools, supporting steel elements and structures, encasement of the ISFS building,
- Pressure vessels and piping systems (cooling, purification and decontamination system),
- Corrosive damage to equipment and technology that is in contact with the coolant for the spent fuel pools (construction of pools, transport equipment),
- Rotary machines (selected pumps and fans),
- Power supply systems and components (transformers, generators, motors and wiring),
- Spent nuclear fuel (shipping).

Monitoring points were installed to monitor settlement of the ISFS building, including monitoring of groundwater level. The ISFS pool lining condition is monitored by assessing the condition of material samples located in the pools and using the acoustic emission method. Monitoring of the fuel condition is performed through the use of the Sipping in Pool system and an inspection stend to monitor the fuel, where non-destructive checks of fuel rods are performed.

Periodic Assessment of ISFS (ISFS PSR)

The assessment was carried out in accordance with the legislation in force as at 30 November 2008. The emphasis in this assesment was placed on meeting the requirements of the then valid ÚJD SR Decree No. 50/2006 Coll. and the ÚJD SR Safety Guide BNS I.7.4/2006 Periodic safety assessment.

The period under assessment, from 2001 to 2008, followed after the project of seismic reinforcement and extension of storage capacity, which was implemented in the period from 1997 to 1999.

As a result of the analyses, a set of corrective measures divided into groups according their priorities is listed in chapter 5 of document “Integrated plan of realization of corrective measures”. From 32 corrective measures 21 have been evaluated as measures having high priority (implementation by

the end of 2012), 7 having medium priority (implementation by the end of 2013) and 4 low priority (implementation by the end of 2014).

Examples of high priority measures:

1. Ensure completion of project documentations of that the requirements described in Regulation 53/2006 Coll. Section 16 Paragraph 2 Letter g (conditions for the carriage of heavy loads over the spent nuclear fuel storage facilities) are fulfilled.
2. Add relevant chapters to the ISFS Safety report reasoning limits and conditions.
3. Include to the program of environmental monitoring measurement of alpha activity of radionuclides collected on aerosol filters from ISFS air-condition quarterly (or biannually).

Examples of medium priority measures:

1. Ensure completion of project documentation for spent fuel disposal concept after the end of the storage.
2. Process as a controlled document list of devices that are subject to the requirements of legislation to monitor their service life.

Examples of low priority measures:

1. Establish a system of periodic review of the implementation of the limits and conditions
2. Develop a methodology according to SAT WENRA, Issue Q.4.2 and determine expert guarantee its correct application.

During the assessment there were no findings that would have such high safety relevance that would require immediate action.

Following the periodic safety review and on the basis of ÚJD SR Decision No. 444/2010, authorization for the following 10 years of operation was granted.

Note: In 2013, the amendment to the Atomic Act No. 143/2013 Coll. set the licensing of operation of all nuclear installations for an unlimited period of time (Previously limited to a period of maximum 10 years. Periodic assessment after 10 years of operation remains valid).

The deadlines for meeting corrective actions were met.

The following periodic nuclear safety review at ISFS will be carried out at the reference date, 30 November 2018.

Stress Tests for the ISFS

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

1. earthquake stronger than envisaged in the project,
2. extreme floods beyond what was envisaged in the design,

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 “Program evaluation – review ISFS response to the Fukushima event type”. Chapter "Seismic event" has been added to an operating document "Addressing failure conditions in ISFS".

Fig. Transport containers TK C-30

The next periodic nuclear safety review at ISFS will be carried out by 30 November 2018 and includes the objectives and elements of individual areas of review focusing on:

1. Comparison of the achieved nuclear safety status at the nuclear installation with the current requirements for nuclear safety and good practice,
2. Assessment of the cumulative effects of aging of the nuclear installation, the impact of both implemented and considered modifications on the nuclear installation, operational experience and technical development on nuclear safety,
3. Identifying justified modifications on the nuclear installation in order to maintain the required high level of nuclear safety or to increase it to level approaching modern nuclear facilities in the world,
4. Demonstrating that the required level of nuclear safety is ensured until the next periodic review, based on an overall assessment of safety of the nuclear installation.

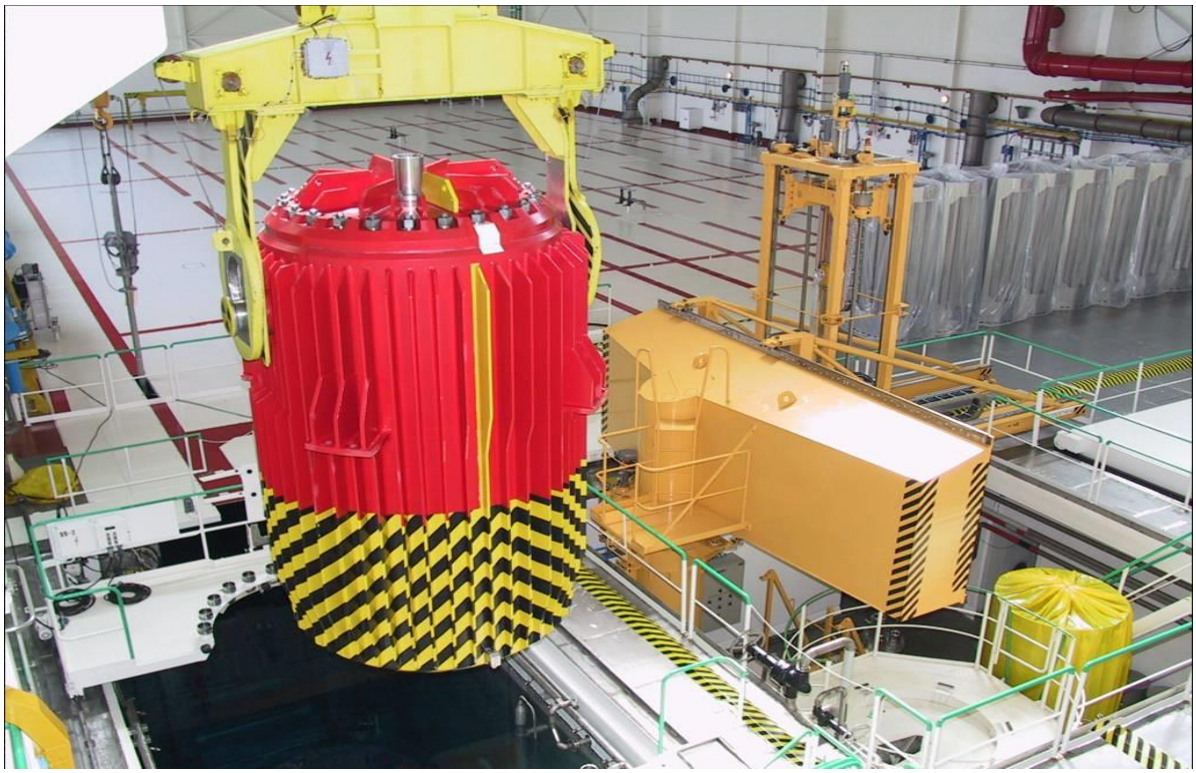


Fig. Transport of TK C-30 by special transport hitch

The impact of decommissioning of V1 NI on the operation of ISFS

Due to the fact that ISFS NI is closely interconnected with the parts of V1 NPP to be decommissioned, it is necessary to make a modification of selected technological systems of ISFS specified in the BIDSF D4.1 Project "Modification of the power plant and installation of new systems", the implementation phase of which started in February 2017.

The scope of the D4.1 project was divided into seven implementation projects:

1. Construction and technological modifications in SO 800:V1
2. Modification of the system for production of cold water for the air conditioning systems
3. Modification of the cold water supply system and demineralized water for ISFS
4. Modification of cable connection of ISFS for LAN,TIS and EPS
5. Modification of contaminated water discharge from ISFS
6. Installation of tapping station at ISFS, installation of piping routes for regeneration and decontamination solutions in ISFS
7. Disassembly of APK-M and SPK-M ducts, including dismantling of piping routes.

Projects for modification of ISFS technology systems will start in 2018. The pipeline dismantling project will be implemented after the completion of projects for supply of cold water and demineralized water, modification of the contaminated water discharge to TSÚ RAW and installation of tapping station for regeneration and decontamination solutions in ISFS.

Increasing storage capacity for SNF

As of 31 December 2017, 12,042 SNFs were stored in ISFS representing 85.43 % of its maximal designed capacity. Due to the actual filling of the wet ISFS, the capacity of which, with the current trend, will be sufficient approx. until 2024, in 2013 an investment project “Increasing storage capacity for SNF at Jaslovské Bohunice site” was approved.

The completion of the existing storage capacity of ISFS at Jaslovské Bohunice site represents an expansion of the storage capacity by a total of 18,600 SNF in two phases, while the first phase represents an expansion by 10,100 SNF, the second phase by 8,500 SNF. The existing ISFS in the site under consideration will be connected with the new capacity by construction and technology. In 2016, the environmental impact assessment process was completed under Act No. 24/2006 Coll., which recommended an alternative technological solution of storage of SNF by extending the storage capacity of SNF with dry method, using storage containers (canisters) with a maximum of 85 SNF placed in reinforced storage modules in the dry part of ISFS. The Final Opinion of the Ministry of Environment of the SR on “Completing the storage capacity of ISFS at Jaslovské Bohunice site“ was issued under No. 1604/2016-3.4/hp on 11 February 2016. At present, the project is at the stage of realization of the work and the development of the implementation project is under way. The date of putting the first module for dry storage of SNF into operation is scheduled for 2021.

Transport container C-30 TK is designed for on-site transportation from Units NPP V2 to ISFS JAVYS, a. s. at the Jaslovské Bohunice site or off-site transport of SNF from the units of NPP Mochovce. TK C30 is transported on a special railway wagon. At ISFS and the main generating unit, it is moved by transport container hinge.

Fuel stored in the basket is transported in a container in a water environment with a nitrogen cushion (wet transport), or with cooling gas - nitrogen (dry transport). The transport packaging set C-30 is moved by using 130 t crane into the receiving shaft by a special transport suspension from the transportation rail corridor. After performing the necessary handling in the receiving shaft, container de-sealing and lid removal, the basket with the spent fuel is moved to the respective position in the storage pool by a trap and 16 t crane.

G.2.2 List and Description of Facilities for Radioactive Waste (RAW) Management

NPPs in operation with WWER-440 are equipped with the following facilities for collection, transport, basic treatment and storage of RAW:

Facilities for basic treatment of solid RAW are represented by collecting equipment, transport equipment, sorting equipment, washers, dryers, low pressure compactor and fragmentation equipment. These are used for fragmentation of metal solid RAW.

Facilities for treatment of liquid RAW are represented by purification (filtration) station with ion exchange resins (ŠOV 3) for purification of waste water, evaporating distillation equipment, treatment plant of contaminated oil, pumping stations and equipment for mechanical filtration of refuelling pool.

Facilities for gaseous RAW management are represented by ventilation systems are provided with filters to capture aerosols and iodine. During 2003 - 2004 replacement of original iodine filters of Soviet provenience with iodine filtration stations took place. As part of completion of the fragmenting workplace a new exhaustion system was installed for the workplace. On the basis of decision of ÚVZ SR the operator of NPP V1 from 2012 is not obliged to monitor discharges of noble gases and iodine-131 (NPP V1 is under decommissioning).

Facilities for storage of solid RAW

The method of storage of solid RAW depends on the type and activity of solid RAW and the packaging used.

Concrete disposal shafts are used for storage of solid low-level RAW.

- 200 litres MEVA barrels are used in concrete disposal shafts for storage of solid RAW to be incinerated and for high-pressure compacting and small size metal RAW to be melted,
- Fence pallets are used to store air filters, or other RAW to be sorted and cleaned, the large fence pallets are used to store also barrels, large-volume solid RAW is stored freely in designated storage shafts,
- Other solid RAW with higher activity is stored in shielded barrels and in shield boxes,
- Mid-activity solid RAW from reactor installations and cleaning of the refuelling pool is stored in a special storage consisting of stainless steel cylinder containers, which is accessible directly from the reactor hall and is made up of a set of vertical metal cylindrical shafts embedded in a concrete mass to shield the radiation.

Facilities for storage of liquid RAW are tanks for storage of untreated liquid RAW and concentrates. Contaminated oils are stored in jerry cans put into MEVA drums, resp. directly in MEVA drums, to which they are pumped from the tanks.

The concentrate is stored in stainless steel tanks with a capacity from 415 up to 550 m^3.

Exhausted ion exchange resins are stored in stainless steel tanks with a capacity from 150 up to 460 m^3, which are located in leak proof concrete shafts capable of capturing the entire volume of the tank in the event of failure.

Technology for Treatment and Conditioning of Radioactive Waste (TSÚ RAW)

Technology for treatment and conditioning of RAW:

- Bohunice RAW Treatment Centre - BSC includes the following technology for the safe treatment and conditioning of RAW:
  - Solid RAW sorting,
  - Liquid RAW concentration,
  - Solid RAW and liquid RAW incineration,
  - Solid RAW high pressure compacting,
  - Liquid RAW and solid RAW cementation,

- Storage and transport of solid RAW and liquid RAW,
- The resultant product is fiber-concrete containers for conditioned RAW by cementation, which meets L&Cs for storage, transport and final disposal in National Radioactive Waste Repository;

- Bituminous lines designed for treatment of concentrates and sorbents and the purification station for active water for treatment of liquid RAW from NPP V1 and NPP V2;
- Discontinuous bituminization line designated for treatment of saturated sorbents,
- Wastewater treatment plant for treatment of liquid RAW from NPP A1;
- Fragmentation plant and large capacity decontamination plant for metal RAW serve for decontamination and treatment of metal RAW;
- Workplace for processing air filters,
- Workplace for crushing used power cables,
- Line for pre-treatment of fixated RAW,
- Facilities for storage of RAW.

Following the periodic safety review and based on the ÚJD SR Decision No. 498/2010, authorisation for operation for the following 10 years of operation, on 30 December 2010.

Note: In 2013, the amendment to the Atomic Act No. 143/2013 Coll. sets the authorization for operation for all nuclear installations for an unlimited period of time (Previously limited to maximum of 10 years. Periodic assessment after 10 years of operation remains valid).

The next periodic safety review at TSÚ RAO will be carried out by the reference date 22 January 2019.

Fig. Bohunice RAW Treatment Center (BSC)

Facility for Final Treatment and Conditioning of Liquid Radioactive Waste (FS KRAO)

The FS KRAO is situated in the NPP Mochovce site in the immediate vicinity of NPP Mochovce 1&2. It was put into operation in 2007. It includes the following technologies for safe treatment and conditioning of liquid RAW:

- Liquid RAW concentration,
- Bitumenisation of concentrates,
- Bitumenisation of ion-exchange resins (sludge),
- Cementation of liquid RAW and solid RAW,
- Preparation of fibre-concrete container for transport.

The FS KRAO facility in Mochovce, the following categories of liquid RAW are treated and conditioned:

- Concentrates,
- Ion-exchage resins (sludge).

The resultant products is also fibre-concrete container with conditioned RAW with cementation, meeting the L&Cs for storage, transport and disposal in National Radioactive Waste Repository.

The first periodic safety review for FS KRAO was carried out with the reference date 4 October 2015.

Integral Storage Facility for RAW (IS RAW)

At Jaslovské Bohunice site a new facility for RAW storage was built, originating from decommissioning of NPP A1 and NPP V1. It is an Integral Radioactive Waste Storage Facility, which is a nuclear facility under the Atomic Act. It is located in the premises of JAVYS, a. s., Jaslovské Bohunice site. The location is 60 km north-east of the Capital of the SR, Bratislava.

The implementation phase of the project started in January 2014 and was successfully completed in October 2017 by issuing an authorization from ÚJD SR for the commissioning of IS RAW at the Jaslovské Bohunice site. Subsequently, there was the final building approval for the nuclear facility IS RAW. The expected termination of operation of IS RAW is in 2087.

IS RAW is designed for storage of solid and solidified RAW. In accordance with Section 2 of the Atomic Act “Definition of certain terms“, storage of RAW means the placement of RAW into spaces, objects or facilities that allow their isolation, inspection and protection of the environment with the intention to subsequently take them out.

The new IS RAW will be used exclusively for storage of:

- Solid or solidified RAW prior to their further treatment at facilities within JAVYS (storage of liquid RAW or SNF will not be allowed in the proposed facility),
- Conditioned RAW using various technologies into solidified (solid) form, originating from the decommissioning of NI at the site until the time when it can be transferred to a place for permanent disposal,

- Solid RAW for a period, during which their activity is decreasing to a level allowing their release to the environment.

Facility for Institutional Radioactive Waste Management (IRAW) and Captured Radioactive Substances (ZRAM)

The original centralized system for collection of Institutional Radioactive Waste Management (IRAW) in the SR was disrupted due to the separation of the Czecho-Slovak Republic. Establishment of a new national system was imposed by government resolution No. 610/2009, which has designated responsibility for storing the captured contaminated radioactive materials within the SR to SE, a. s. - VYZ, while from 1 April 2006 the commitments were transferred to Nuclear and Decommissioning Company (JAVYS, a. s.).

The Government of the Slovak Republic by its Resolution No. 610 from 2 September 2009 approved the draft procedure for IRAW management and for captured radioactive materials and charged JAVYS, a. s., with constructing a complex facility for accepting, sorting and long-term safe storage of such materials.

IRAW and ZRAM management represents a set of the following activities:

- Collection,
- Characterization,
- Sorting,
- Treatment,
- Conditioning,
- Storage,
- Disposal.

A centralised facility for safe storage of IRAW, ZRAM originating from the whole teritory of the SR, until the period of their further management was built at Mochovce and put into operation in 02/2016. Subsequently, all IRAW stored at the TSÚ RAW facility at Jaslovské Bohunice site was transferred into the facility for IRAW and ZRAM management.

G.2.3 Radioactive Waste Shipment

Facilities for shipment of radioactive waste are necessary to ensure the activities related to the loading of radioactive waste from the nuclear installation, IRAO, abandoned sources, radioactive waste of unknown origin and unused radioactive sources at the place of loading, their shipment and unloading at the destination. In order to ensure the concept of treating RAW, IRAW and ZRAM, a transport system has been developed in the SR allowing the shipment of:

1. Solid and liquid RAW within Jaslovské Bohunice premises;
2. Solid RAW between Jaslovské Bohunice – Mochovce sites,
3. Institutional RAW and ZRAM from the whole territory of the SR to Jaslovské Bohunice, resp. Mochovce.

The shipment of RAW is performed in certified transportation equipment on means of transport meeting the conditions of the European Agreement on international carriage of dangerous goods (ADR), or the Regulation concerning international carriage of dangerous goods (RID), the Atomic Act and the Decree of ÚJD SR No. 57/2006 Coll.

Fig. Transport of fibre concrete containers to the National Repository of RAW

Fig. Transport of solid RAW at Jaslovské Bohunice site and between Jaslovské Bohunice and Mochovce site

Fig. Transport of KRAO at Jaslovské Bohunice site

G.2.4 National Repository for Radioactive Waste (RÚ RAO)

The National Repository for Radioactive Waste (put into operation in 2001) is a near-surface type, designed for disposal of solid and solidified low activity RAW from operation and from decommissioning of nuclear installations. The Repository site is located about 2 km northwest from the NPP Mochovce site.

The basic safety requirement for a repository is that during its operation, period of institutional control and after its completion no leakage of radionuclides to the environment shall occur that would cause radiation exposure exceeding the values of radioactive substance set by valid legal regulations.

The repository is built in a geological formation with low permeability and high sorption capacity. Artificial layer of compacted clay represents an additional barrier against radioactivity leakage. A drainage system mouthing into monitoring shafts, which enables to control eventual water leakages from each disposal box, is built between it and the disposal boxes. Other basic engineering barriers

against leakage of radionuclides to the environment include concrete structure of the repository, fibre-concrete container and solidified form of radioactive waste.

Fig. VBK after measurements taken at Gamma scanner prior to disposal into disposal boxes of the repository arranged as double-rows

The Repository is currently formed by a system of disposal boxes arranged into two double-rows, 40 boxes each. The capacity of one box is 90 fibre-concrete containers (VBK). The total present capacity of the repository is 7,200 containers with total volume of 22,320 m^3. The inside volume of VBK is 3.1 m^3. Compacted and bituminized waste are fixed with active or non-active cement mixture.

Following the periodic safety review, ÚJD SR issued by its Decision No. 490/2011 a license for operation of RÚ RAO in Mochovce. The authorizations given in this Decision shall be valid until the first and the second double-row of storage boxes are filled according to the valid Pre-operational Safety Report, however, the latest until 31 August 2021. In the operating license, ÚJD SR has set an obligation to implement corrective actions according to the priorities and within the deadlines identified during periodic review (latest by 2014).

The relevant corrective actions were implemented within deadlines given in the ÚJD SR Decision.

Note: In 2013, the amendment to the Atomic Act No. 143/2013 Coll. sets the authorization for operation for all nuclear installations for an unlimited period of time (Previously limited to maximum of 10 years. Periodic assessment after 10 years of operation remains valid).

The next periodic safety review of RÚ RAO will be carried out to the reference date 14 September 2019.

In order to be able to proceed continuously with disposal of RAW a second double row of disposal boxes was built and put into operation. The third double row of disposal boxes will be built until 2019, the building of which began in 2016.

The repository site allows for expansion up to 7.5 disposal double rows, i. e. for disposal of approx. 27 thousand VBK containing RAW.

The first and the second double rows are protected from meteorological impacts by halls ensuring that the storage area is covered over the entire process of disposal operations until it is replaced by a definitive cover.

For the disposal of very low level radioactive waste, i.e. waste, the activity of which is only slightly above the limits for their release into the environment (contaminated soil, crushed concrete from decommissioning) separate storage facilities have been built within the existing National RAW disposal at Mochovce site. In the years 2015 and 2016, the first stage of repository for VLLW was completed with a capacity of 20,000 m^3 VLLW from the decommissioning of NPP A1. On 04 July 2016 ÚJD SR by Decision No. 338/2016 authorized the operation of this part of VLLW repository.

Fig. Disposal of VLLW in the first stage of VLLW repository with a disposal capacity of 20 000 m^3 for RAW from the decommissioning of NPP A 1

In 2017 the second stage of VLLW repository was completed with a disposal capacity of 9,000 m^3 for VLLW from the decommissioning of NPP V 1.

G.2.5 List and Description of Facilities in Decommissioning and Facilities for Radioactive Waste (RAW) Management from Decommissioning, which are part thereof

NPP V1 Bohunice – In Decommissioning

Nuclear power plant V1 (NPP V1) is located at the Jaslovské Bohunice site.

NPP V1 has 2 pressurized water reactors of WWER-440/230 type. NPP V1, Unit 1 was commissioned in December 1978 and Unit 2 in March 1980.

In accordance with the Government Resolution No. 801/1999 operation of Unit 1 was terminated by 31 December 2006 and the operation of Unit 2 by 31 December 2008.

Following the removal of spent nuclear fuel from NPP V1 to the ISFS and based on the positive opinion of the European Commission according to Article 37 of the Euratom Treaty, ÚJD SR issued its Decision No. 400/2011 for the stage 1 of decommissioning of this power plant, which came into force on 20 July 2011.

Decommissioning of NPP V1 has been implemented in two stages.

The scope of works of stage 1 of decommissioning (2011 – 2014) included dismantling of equipment and removal of structures of the secondary circuit that is outside the controlled area of the nuclear power plant, which are not needed or suitable for further use. During this stage, the documentation necessary for obtaining license for the stage 2 of decommissioning of NPP V1 was prepared. After reviewing the above documentation, ÚJD SR issued its Decision No. 900/2014 containing:

- Authorization for stage 2 of decommissioning of NI NPP V1;
- Authorization for the management of RAW;
- Authorization for the management of nuclear materials.

The activities of stage 2 of decommissioning of NPP V1 (2015 – 2025) are focusing on dismantling of facilities and structures of the primary circuit located in the controlled area, i.e. decommissioning of the nuclear island. Dismantled will be also other not needed external objects at the NPP V1, tanks, underground piping and cable channels. After the site is restored to its original condition (or demolition) the site will be released from regulatory control according to the Atomic Act.

Currently there are 53 BIDSF projects completed and the implementation of another 14 projects is under way. There are 2 projects in a preparatory phase and another 3 projects are planned. JAVYS, a. s., after obtaining the decommissioning license, performs activities representing irreversible changes to the power plant technologies, such as: modifications of essential service water systems, dismantling of diesel-generators and transformers, 220 kV substations, equipment in the machinery room on TG and electrical buildings, modification of the 110 kV switchgear, modifications of power supply systems for self-consumption and after the shutdown of NPP V1 transfer of systems for the needs of other NIs crossing the premises of decommissioned NI NPP V1 and other scheduled activities.

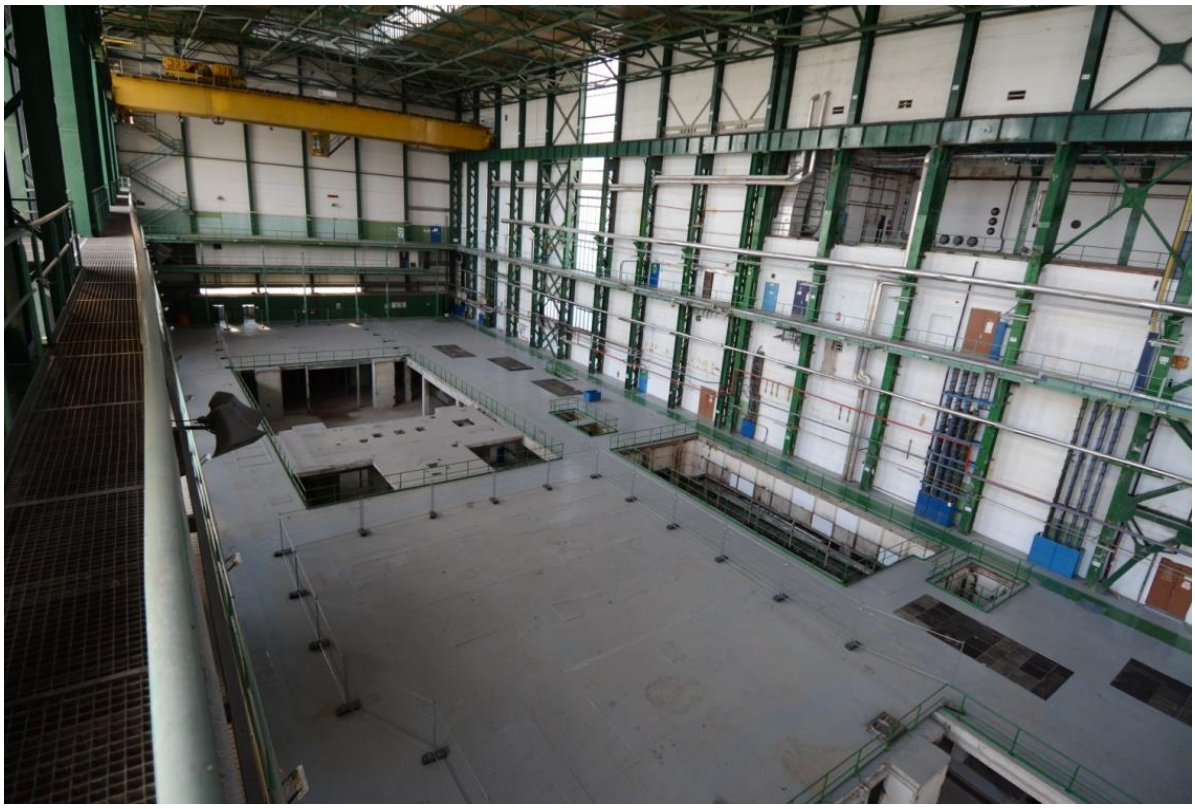


Fig. Machinery room after dismantling of the technological part

NPP A1 Bohunice – In Decommissioning

Nuclear Power Plant A1 with heterogeneous reactor KS-150, was designed for electric output of 143 MW. Natural metal uranium was used as fuel, heavy water (D_2O) as moderator and carbon dioxide (CO_2) as coolant - HWGCR.

The A1 NPP was connected to the power distribution network in December 1972. After an operational accident in January 1976 (first accident) 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 with its Resolution No. 135/79 decided not to continue in operation of NPP A1.

Activities aimed at decommissioning of NPP A1 have commenced. Due to the absence of legal regulations for decommissioning of nuclear power plants at that time any partial issues were solved on a case-by-case basis and the individual activities were approved as modifications having impact on nuclear safety. The works concentrated on:

- Removal of consequences of the operational event,
- Preparation of fuel export to USSR / RF,
- Development and subsequent implementation of RAW management technologies.

The first integrated documentation for decommissioning of NPP A1 was developed in 1992. The currently valid concept and the time schedule for decommissioning of NPP A1 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. **Updated documentation**

for the initial stage of decommissioning was elaborated during 1994 - 1996. In 1999 ÚJD SR issued Decision No. 137/1999 for the **stage 1 of decommissioning**, 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,
- Most of the liquid RAW from operation has been treated or is safety stored.

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 A1 in accordance with the Plan for the Second Stage of Decommissioning of NPP A1, which enabled to continue with a continual alternative in the process of decommissioning of NPP A1. The following period was focused in particular on decommissioning of external objects of the nuclear installation of NPP A1, on the issue of handling contaminated soil and RAW management produced by the main generating Unit of NPP A1.

The current status of NPP A1 can be characterized as follows:

- Export of spent fuel to the Russian Federation was completed in 1999 (based on an inter-governmental treaty from 1956);
- Medium for the cooling of spent nuclear fuel: Chrompik (aqueous solution of chromium and potassium dichromate - $K_2Cr_2O_7$) is continuously vitrified, sludge in sleeves and sludge at the bottom of the pool for long-term storage is solidified into geopolymers and cement matrix, dowtherm (an organic liquid mixture of diphenyl and diphenyloxide – originally coolant for fuel cells) was purified and incinerated or fixed into geopolymer matrix. More than 99 % of water activity of the long-term storage pool was captured on special sorbents. Liquids from the long-term storage pool was processed by concentration on the evaporator. The bottom sediments were transferred to a new storage tank;
- Liquid operational waste (concentrates) were bituminized, liquid waste from decommissioning of NPP A1 and together with other waste from Jaslovské Bohunice site are gradually conditioned and disposed at the repository;
- Storage of solid RAW, object 44/20, was reconstructed, waste removed, sorted and stored in a controlled manner. Part of these RAW has been treated, conditioned and disposed;
- The original, not operated storage tanks that posed the greatest potential risk for the environment were decontaminated and removed.

Technological equipment with induced activity or higher level of contamination is continuously dismantled within the next stages of decommissioning, where stage 2 was implemented until 29th of September 2016.

Facilities for Management of Radioactive Waste (RAW) from Decommissioning – part of NPP A1

At present, RAW has been removed, sorted and stored in 200 dm^3 drums. The incinerable RAW is transported to the TSÚ RAW for further management. The sorting facility is used for sorting solid RAW

produced from operation of NPP A1 compacted into packages for burnable, not burnable, compactable and metal. Workplaces for RAW management from decommissioning are equipped with different technologies.

Workplace for contaminated concrete (PNKB) management

The workplace is made of PNKB containment, in which large parts of concrete blocks are gradually decontaminated in an abrasive manner.

Vitrification Plant of Chrompik (VICHR)

Vitrification plant is for fixation of radioactive chrompik into a glass matrix of boric silicate type to achieve significant volume reduction and to enhance the storage safety of this specific radioactive liquid waste.

Manipulation box for handling medium level radioactive materials allows:

- cutting materials and sampling,
- clamping and machining of high level contaminated materials,
- handling samples (insertion, removal from containers),
- detailed visual inspection of objects,
- taking photos of objects.

Fragmentation workplace for long-term storage cases allows:

- fragmenting metal parts of long-term storage without inner content,
- inserting fragments into empty barrels or shielded 200 l barrels (shielding of pre-concrete reinforced barrels and barrels with steel insert),
- measuring the dose rate on the drum surface and overall activity in the drum,
- performing inner rinsing of scissors, knives, working chamber, filling and discharging head,
- trapping the rinsing medium in trapping tanks,
- placing the lid on the drum and putting the drum into transport container for drums

and other technologies.

Mobile Facilities for Radioactive Waste (RAW) Management

Facility for fixation of sludge (**ZFK)**. This facility located in ISO containers and relocatable according to the decommissioning needs, was commissioned in 2007 and it enables fixing RA sludge with specific beta, gamma activity of cca 10^9 Bq.kg^{-1} into a cement matrix. Currently it treats bottom sediments, concentrated from all external tanks of NPP A1.

Facility for sludge fixation SUZA II is designed for treatment of sludge phases from the long-term storage pool, moved to the certified NPN2 tank. The plant treats the sludge phase into a cement matrix at the reactor hall of A1 NPP. The SUZA II technology is sectoral, consisting of four operating modules – a storage module, pumping module, fixation module and transport module.

Mobile fragmentation facility (MFZ) is designed for fragmentation of large scale metal RAW, whose dimensions, weight and material composition meet the required criteria. The facility is secured against atmospheric influences and can be moved within the premises by JAVYS siding. The workplace is a standard four-axle wagon chassis with an atypical container placed on the chassis. The roof of the container can be opened at the point of loading metal RAW. Decontamination and fragmentation of metal RAW is carried out using diamond rope saw.

Mobile decontamination equipment FRAGIS II. This facility is located in an ISO container, it is transferable according to the decommissioning needs and enables decontamination of metal RAW in-situ. Decontamination is performed by ultrasonic and electrochemical methods. At present the plant is connected to the main generation block of A1 NPP and is used for decontamination of metal materials from the decommissioning of A1 NPP.

Workplace for sorting contaminated soils is an autonomous technology, transportable by regular means of transport; requires power supply. It comprises of 4 functional mutually linked units:

- Preparation of soils,
- Transportation of soils for monitoring,
- Monitoring and sorting of soils,
- Shipment of soils after monitoring and sorting from the workplace.

For **solidification of RA sludge into geo-polymer matrix SIAL** 4 mobile fixation technological units were designed, produced and completed for supply treatment of sludge at NPP A1 and other NPPs. Product of these plants is sludge fixed in SIAL matrix in steel drums with a capacity of 60 dm^3 or 200 dm^3.

For decontamination of some equipments, such as tanks, pipes and others, **decontamination circuit mobile facilities** identified as DEZA-OD were designed and manufactured. These facilities consist of several modules, which are mutually interconnected and enable to perform pre-disassembly decontamination of equipments and pipe lines in closed hydrodynamic circuit. Decontamination is performed with the help of decontamination solutions. In the present time, one of these facilities is installed at NPP A1 and another one at NPP V1.

G.3 Safety demonstration

The operator is obliged to provide for sufficient financial and human resources to ensure nuclear safety, including the necessary engineering and technical support in all areas related to nuclear safety. The authorization holder (licensee) shall give priority to safety aspects over all other aspects of the authorized activity.

The obligations of the operator are provided primarily by the provisions of laws listed under E.2.

Any modifications to nuclear installation affecting nuclear safety during construction, commissioning, operation, decommissioning, closure of repository or after closure of repository may be implemented only after a preceding approval or permission of relevant regulatory authorities has been obtained and

in special cases after having obtained the statement (opinion) of the European Commission. Other modifications must be notified by the operator, or submitted for review.

The authorization holder shall issue operating procedures for the performance of activities at a nuclear installation, in particular service, maintenance, control and testing of classified equipment. These procedures shall be in accordance with the conditions of the authorization. The authorization holder shall update and complete these procedures according to the current state of the nuclear installation.

The operator has the obligation to report to the regulatory authorities events at nuclear installations and in case of incidents and accidents also to other organizations and to the public, to take action to prevent recurrence.

The holder of authorization has the obligation to provide information to the public on nuclear safety. This obligation does not change the responsibility of ÚJD SR to provide the public with its own independent assessment.

In practice, the operator of a nuclear installation uses other essential specialized organizations, in the field of maintenance, operation or research. These specialized organizations have the function of so-called technical support organizations and are involved through their activities in supporting reliable and safe operation of nuclear installations, since the works, which they carry out, cannot be provided for by the operator with his own human resources, nor in organizational, technical and knowledge terms.

The licensee is given the obligation to identify for all radioactive waste a suitable system for their treatment in at least two alternatives justifying the choice of one of them.

The licensee is required, during operation, to hand over radioactive waste within one year of their production and spent nuclear fuel immediately after fulfilling the requirements for its safe transport and storage, to the legal entity – JAVYS, a. s. – authorized by the MH SR and by ÚJD SR.

The producer of radioactive waste is responsible for safe management of radioactive waste up to their disposal, and the licensee operating the facilities for the management of radioactive waste and spent fuel is responsible for safety of these facilities.

The licensee´s responsibility is to check and verify before closing the repository its readiness and also the readiness of the staff and the compliance of the documentation with its current status.

G.4 Integrated Management System - IMS

IMS is implemented in accordance with the applicable national legislation, the IAEA documents No. GS-R-3 and IAEA No. GS-G-3.1, ISO 9001; ISO 14001, OHSAS 18001 and ISO/IEC20000-1 standards. Integrated management system of the operator is process oriented.

The continuous relevance, adequacy and effectiveness of the integrated management system and its ability to achieve the objectives set by the company is reviewed by:

- internal audits conducted within IMS for the fields of safety, quality, environmental protection, in a form of autonomous or combined internal audits,

- supervisory audits of external certificate companies, which have certified integrated management system and
- inspections conducted by the ÚJD SR
- management review of ISM once a year in the form of material for the Director General´s meeting.

Any findings identified during the audits, inspections and reviews are subject to analysis at the corresponding level of the top management. Based on analyses, remedial and preventive measures are taken; their implementation is controlled.

Achieving the required quality of all basic processes and sub-processes and their subsequent continuous improvement is also ensured by:

- identification and management of non-conformities, implementation of activities to eliminate non-conformity found, implementation of corrective actions to eliminate the causes of non-conformities and preventing their recurrence according to the requirements of the basic directive, RS/NE/ZSM Management of non-conformities, corrective actions and measures against risks, improvements;
- identifying, analysing and risk and opportunity assessments, proposing measures against risks, monitoring and risk management related to the Integrated Management System JAVYS, a.s. according to the requirements of the basic directive “RS/IR/ZSM Identification and Risk Management“

Funding of safe operation

One of the principles of nuclear and radiation safety of operators is the commitment to have necessary financial means to meet nuclear and radiation safety and to provide for continuous training and improvement of qualification of the staff. In order to fulfil this commitment, financial strategies of companies were developed that would enable, among the tasks mentioned, also fulfilment of the program for technological development.

Financial strategy of the operators is defined as providing for funding operation and investment needs of the company by optimal utilization of own and external resources (see also Art. 9).

H EXPERTISE AND SKILLS (art. 8)

Member States shall ensure that the national framework require all parties to make arrangements for education and training for their staff, as well as research and development activities to cover the needs of the national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills.

Expertise and skills

Qualified of human resources represent the principal precondition for a safe, reliable, economical and environmentally friendly operation of nuclear installations. The term “qualified human resources” is understood as a set of professional, health-related and mental capacities of the staff to perform activities at nuclear installations. From the aspect of impacts of working activities on nuclear safety, the staff of the authorization holder is classified into two basic groups:

- Employees having direct impact on nuclear safety – licensed employees, whose special competence is verified by an exam (written exam, oral exam and verification of competences on a representative full-scale simulator) and a practical test for licensed employees before an examination commission established by ÚJD SR, which issues License of special competence *(currently this category is no longer in JAVYS, a. s.);*
- Employees with impact on nuclear safety – professionally competent employees, whose Professional competence was verified by a panel established by the operator of specialized facility in a form of written and oral exam and to whom Certificate of Professional competence has been issued.

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

Professional competence means a complex of professional knowledge, practical experience, knowledge of generally binding legal regulations and operating procedures issued by the authorization holder, necessary to perform work activities by the employee of an authorization holder. Professional competence is acquired by successful completion of Professional training at a specialized facility.

The overall working (professional, health and mental) competency of staff to carry out working activities at nuclear installations is the responsibility of the authorization holder. The authorization holder authorizes his personnel to perform working activities, based on achieved professional competency. An “Authorization to Perform Working Activities” as part of the Integrated Management System (IMS) for quality assurance of a nuclear installation – an authorization holder. The Authorization to Perform Working Activities is issued for a given position and concrete nuclear installation only for those selected and professionally competent employees of the authorization

holder, who have valid Licenses of Special Professional Competency or Certificates of Professional Competency. The authorization is an evidence of working competency of an employee in relation to the regulatory authorities.

Each position within the system of professional training has defined requirements for education, experience, professional training, health or mental capabilities. The direct supervisor of the employee is responsible for meeting these requirements.

The professional training system of the authorization holder staff is updated on the base of operational experience, performed organizational changes, technical solutions (modernization) on installation, requirements of regulatory authorities, audits, reviews and recommendations of IAEA. It is provided for by necessary human, financial and material resources.

The professional training of the authorization holder staff and third parties (third parties represent contractors) is being conducted in accordance with documents of quality assurance management program, which is set up and maintained in accordance with:

- Generally binding legal regulations of the Slovak Republic;
- the IAEA standards, recommendations and guides;
- ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 and ISO/IEC20000-1:2011 series standards;
- Management documentation in the Quality System.

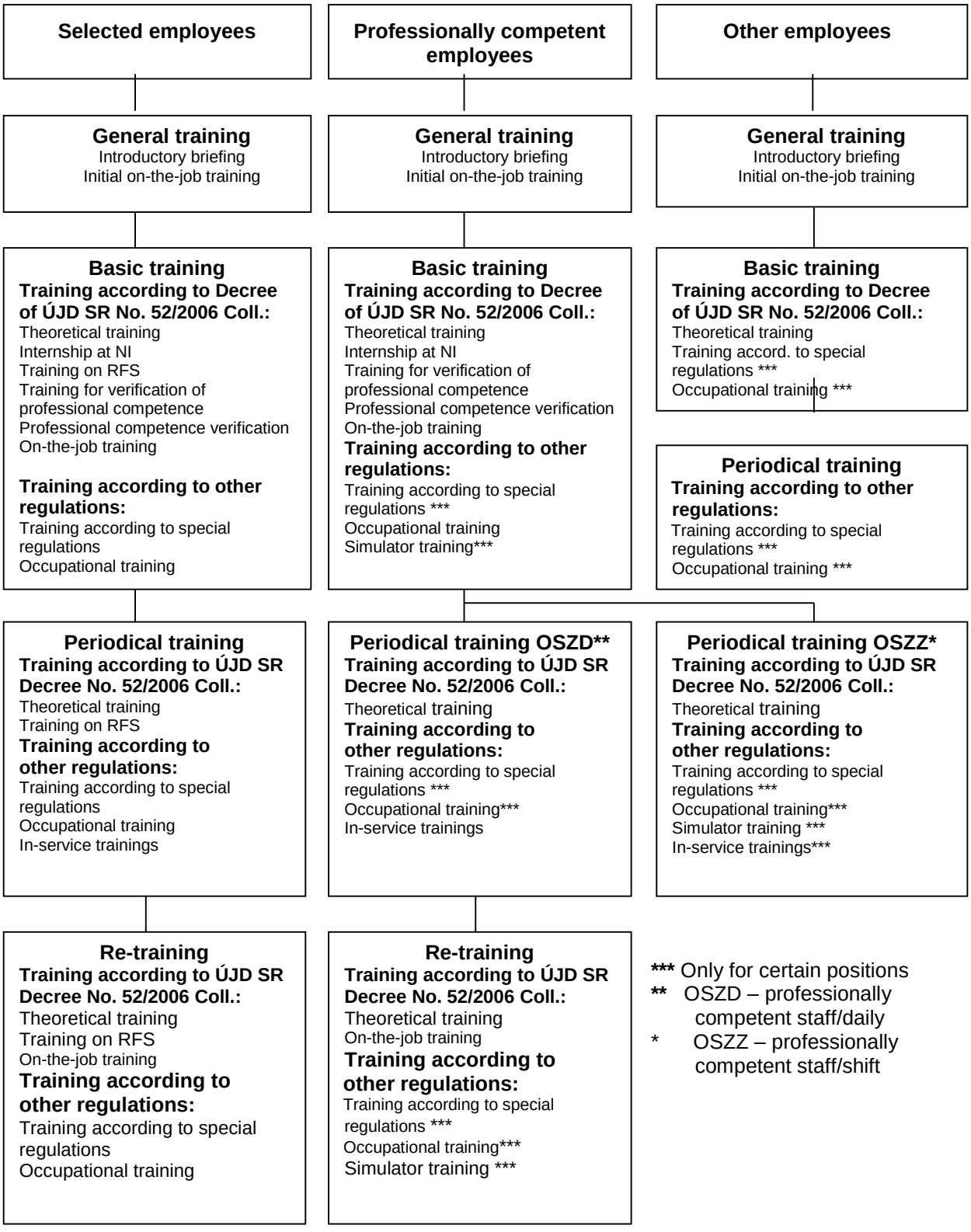


Fig. Chart of Professional training system for employees

Employees are allocated to the relevant type and phase of professional training and divided according to the performed working activities into six categories that are further subdivided into occupational groups and subgroups, following occupational orientation:

Category 1 - the selected personnel are the employees with university education who perform working activities with direct impact on nuclear safety (permanent crew of control room, shift supervisor, supervisory physicist, shift start-up engineer and senior start-up supervisor).

Category 2 - technical and administrative professionally competent employees of operation, maintenance and technical support departments with university education or secondary education.

Category 3 - operating shift and operating professionally competent staff, including employees involved in maintenance activities at technological facility with impact on nuclear safety.

Category 4 - professionally competent maintenance employees (except for engineers) – employees involved in maintenance activities at technological facility with impact on nuclear safety.

Category 5 - professionally competent employees in charge of NI decommissioning and operation of nuclear installations for management of RAW and SNF fuel with impact on nuclear safety.

Category 6 - other employees assigned to professional training without impact on nuclear safety.

JAVYS, a. s. only has categories 5 and 6.

Operator of specialized facility

Professional education and training of employees of authorization holder, as well as of employees of contractors, is carried out at the operator of a specialized facility, who is a holder of authorization for professional training issued by ÚJD SR upon written application after reviewing the technical equipment used during the training and professional competency of applicant‘s employees. The practical exercise (internship and on-the-job training) is carried out within the premises of the operator on the basis of licence from ÚJD SR for professional staff training. Professional training is carried out in compliance with the ÚJD SR decree No. 52/2006 Coll. on professional competence and with the approved system of professional training according to the training programs.

Regulatory Body

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.

I FINANCIAL RESOURCES (art. 9)

Member States shall ensure that the national framework require that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators.

Financing RAW, SNF Management and Decommissioning of Nuclear Installations

The Act No. 238/2006 Coll. on National Nuclear Fund for Decommissioning of Nuclear Installation and for Management of Spent Nuclear Fuel and Radioactive Waste (Act on Nuclear Fund) sets rules for management, contributions and the scope of activity of the Fund for Decommissioning of Nuclear Facilities.

The purpose of establishment and activity of the National Nuclear Fund is to collect and administer financial resources (resources of the Fund) determined for the back-end of nuclear energy and grant these resources in sufficient amount in a transparent and non-discriminatory manner to the applicants for covering of lawful expenses incurred in connection with activities related to the back-end of nuclear energy under conditions mentioned in the Act and in compliance with the SR´s commitments resulting from the Joint Convention.

The Fund resources are funds paid as:

a) obligatory contributions of the authorization holders for operation of nuclear installations generating power (per megawatt of installed electrical power capacity and also price per unit of electricity generated in the nuclear installation),
b) transfer from the budgetary expenditure account of the MH SR as a levy is collected by the system operators (transmission system and distribution systems),
c) penalties imposed by ÚJD SR according to a specific legal provision,
d) interest payments (revenues) from deposits on nuclear fund accounts,
e) voluntary contributions from natural and legal entities,
f) subsides and contributions from the EU funds and other international organizations, financial institutions and funds provided to cover the expenses of back-end nuclear energy,
g) subsides from the state budget,
h) revenues from financial operations,
i) other resources, if required by a special regulation,
j) fees from the applicants for issuing permit for activities leading to exposure by a radioactive source represent a financial guarantee.

Currently among the basic (majority) resources of the Fund are the mandatory contributions by the operators of nuclear installations generating electricity, and by Government regulation No. 426/2010 Coll. from 1 January 2011 also the transfer from the budgetary expenditure account of

the MH SR as levies collected by the operators of the transmission system and the distribution systems.

The Fund forms targeted sub-accounts from the obtained resources, structured in the following way:

a) sub-account for decommissioning of nuclear installations operated at the Jaslovské Bohunice site including the management of radioactive waste from their decommissioning, structured as analytical accounts:
   - Nuclear power plant A1,
   - Nuclear power plant V1,
   - Nuclear power plant V2,

b) sub-account for decommissioning of NPP Mochovce including the management of radioactive waste from its decommissioning,

c) sub-account for decommissioning of nuclear installations, which will be commissioned after the entry in force of the Act on Nuclear Fund, including the management of radioactive waste from their decommissioning,

d) sub-account for management of orphan nuclear materials and radioactive waste,

e) sub-account for siting, geological research, preparation, design, construction, commissioning, operation and closure of radioactive waste or spent fuel repositories including monitoring after the closure of these repositories and including respective research and development,

f) sub-account for institutional inspection of repositories,

g) sub-account for storage of nuclear spent fuel at the nuclear installations themselves,

h) sub-account for reimbursement of expenses determined for administration of the Fund and expenses related to the administration of the Fund,

i) sub-account for reimbursement of expenses for the management of IRAW.

Resources of the Fund are kept on individual sub-accounts and on individual analytical accounts proportionally in relation to the amount of contributions paid by respective authorization holders for operation of nuclear installations generating power, or on the amount of transfer from the budgetary expenditure account of the Ministry of Economy.

The Fund´s resources are kept on individual sub-accounts and individual analytical accounts in proportion to the amount of contributions paid by the respective license holders for operation of nuclear power installations, or to the amount of the transfer made from the expenditure budgetary account of the MH SR.

Resources of the Fund may be used to cover eligible costs incurred in connection with activities related to the back end of the nuclear energy referred to in the Act. The resources from the Nuclear Fund can be granted to the applicants as a special purpose grant based on written application supported by a project with technical and economic justification. Funds can only be granted upon meeting the conditions defined by the Act No. 238/2006 Coll., and after their approval by the Fund´s

Board of Trustees. Once approved, the resources from the Nuclear Fund are provided under a Grant Agreement.

Financial means of the Nuclear Fund can be used for:

a) shutdown of nuclear installation,
b) decommissioning of nuclear installations including management of radioactive waste from this decommissioning,
c) management of spent nuclear fuel and radioactive waste after termination of operation of originating nuclear installation,
d) management of nuclear materials and radioactive waste, whose originator is unknown,
e) purchase of land for placing a spent nuclear fuel and radioactive waste repository,
f) prospecting, geological survey, preparation, design, construction, commissioning, operation and closure of repositories,
g) administration and activities relating to Fund administration,
h) payment of insurance for liability of the operator of nuclear installation, which is in decommissioning,
i) back-end of management of IRAW and for activities related to it up to the amount of contribution paid as financial guarantee.

Units of NPP V1 were shutdown in 2006 and 2008. Costs for shut down and decommissioning of NPP V1 are financed from the following resources:

- from resources of SE, a. s. and JAVYS, a. s., during shut down;
- from the BIDSF funds. When the SR acceded to the EU the Bohunice International Decommissioning Support Fund – BIDSF was established, through which the EU, in the budgeting period 2007 – 2013 and 2014 - 2020, provides financial resources in order to mitigate the economic impacts of the early shutdown of NPP V1. MH SR decides about the use of these funds to finance various national projects in the energy sector, besides other also preparation of decommissioning of NPP V1 itself (modifications to the technological systems related to shutdown and decommissioning of NPP V1, licence documentation, conditioning and disposal of RAW and decommissioning activities of NPP V1), improving energy efficiency, modifications in the overhead transmission system focusing on safety and reliability of power supplies. NPP V1 has so far drawn these funds through approx. 60 individual or consecutive projects, the number of which will continue to rise in line with the progress of works on decommissioning of NPP V1;
- from the Funds resources, in accordance with the Grant Agreement for the relevant year on the basis of approved applications for the decommissioning of NI NPP V1, for co-financing of selected BIDSF projects, for financing compensations for contractors of BIDSF projects, for financing of induced supporting costs of decommissioning of NI NPP V1, and other activities according to the Act No. 238/2006 Coll.

J TRANSPARENCY (art. 10)

1. *Member States shall ensure that necessary information on the management of spent fuel and radioactive waste be made available to 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, recognised in national legislation or international obligations.*
2. *Member States shall ensure that the public be given the necessary opportunities to participate effectively in the decision- making process regarding spent fuel and radioactive waste management in accordance with national legislation and international obligations.*

In the Slovak Republic, the right to information is guaranteed by the Constitution and by other documents on human rights since the beginning of 1990s. The Act No. 211/2000 Coll. (the Act on Free Access to Information, as amended) provides for the public a legal way to obtain the needed information. This Act together with the Atomic Act and the Act No. 24/2006 Coll. on the Environmental Impact Assessment, form the legislative framework for communication with the public in the field of nuclear energy. Pursuant to the Atomic Act (section 27, par. 4) the operator is obliged to inform ÚJD SR on events in the operated nuclear installations and in case of incident or accident in accordance with section 28 par. 3 of the law, it has to also inform the public. Among the obligations of the holder of authorization, according to the Atomic Act (Section 10, par 1, letter m), is to inform the public also about assessment of nuclear safety at the nuclear installations operated by the holder of authorization. The Act No. 24/2006 Coll. on the environmental impacts assessment transposes the EU Directive in the given field (Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment), and also implements the Aarhus Convention not only in the field of public information, but also public participation on the decision-making processes concerning environmental issues. The operation, safety improvements at NIs at Jaslovské Bohunice V2 and Mochovce, as well as construction of Units 3&4 in Mochovce, influenced the life in those regions significantly, which has required necessary intensification in the communication with the regions in the vicinity of NIs, as well as on a national level. Transparent information on all aspects of construction, operation and decommissioning and disclosure of publicly available information channels has become an integral part of an open policy of operator and regulators. Among the most significant communication channels are:

- SE, a.s. Information Centre Energoland Mochovce – in 2017, Energoland received 16 thousand visitors from all over the SR and from abroad + several tours of the EMO construction site for students of Slovak technical universities,
- JAVYS, a. s. information centres at the Jaslovské Bohunice and Mochovce sites – in 2017, more than 2,600 visitors,

- Bimonthly “Energy for the country“, issued by SE, a.s. – distributed free of charge in the Mochovce and Bohunice regions with a circulation of 5,000 pcs + digital version and other printed matter (information brochures and leaflets at Info-centres and websites of license holders), where information is processed in an accessible and comprehensible form,
- Quarterly publication “With us“, published by JAVYS, a. s.- distributed free of charge in Jaslovské Bohunice and Mochovce regions with a circulation of 6,000 pcs + digital version,
- Websites of license holders – www.seas.sk, www.javys.sk and of the regulator, ÚJD SR – www.ujd.gov.sk,
- Social networks Facebook, LinkedIn, YouTube, Instagram, Twitter,
- Portal www.slovensko.sk, where the official notice board of ÚJD SR is placed and which acts as the national communication point for all public administration authorities in relation to the public,
- Civil Information Commissions (hereafter only as CIC) Mochovce and Jaslovské Bohunice, consisting of elected and other representatives of the regional public. Members of CIC hold regular meetings with the management of operators, as well as with the representatives of the regulator and thus they are getting qualified first-hand information,
- Regional associations of towns and municipalities, which also communicate and solve their problems in conjunction with the NI operators in the given region and with the regulator,
- Programs of local sponsorship of operators assisting in areas, which need it the most and which bring win-win benefits (education, medical services and charity, culture, sports, environment),
- Occasional public events organized by SE, a.s. and JAVYS, a. s., such as for example, Energoland Night, Family Safety Day, Open Door Day, Sports Games, etc.,
- Other: seminars for journalists, mayors and representatives of self-government; press conferences and briefings at significant events, press releases for the media, active participation at national and foreign exhibitions, conferences, etc.

ÚJD SR provides information upon request and at the same time is active in disclosing information on the condition of nuclear installations in the SR and on its activity as a regulatory body, by which it allows to the public and the mass-media to check the data and information on nuclear installations, as well as on ÚJD SR. The web site of the authority (www.ujd.gov.sk) besides the above mentioned information discloses also the initiated, ongoing and completed administrative proceedings according to the Act No. 71/1967 Coll. on administrative proceedings, as well as decisions issued by ÚJD SR in full together with the rationale. In addition, ÚJD SR publishes important information on the portal www.slovensko.sk. ÚJD SR has established a touch screen information kiosk, where it is possible to view the administrative proceedings of ÚJD SR (completed and currently ongoing), and also decisions issued by ÚJD SR. Also, the website of ÚJD SR is available to the public. The touch screen information kiosk is located at the seat of ÚJD SR in Bratislava – in front of the building and is accessible to the public 24 hours a day.

ÚJD SR has competencies in the field of public information regarding nuclear safety and monitors other media sources with the aim to obtain the necessary overview on the information policy of the given entity. ÚJD SR is a regulatory body, which independently from operators of nuclear installations provides information on nuclear safety of nuclear installations including information on the safety of radioactive waste, spent nuclear fuel management, nuclear materials, their control and record keeping, as well as information on other stages of fuel cycle.

Every year, ÚJD SR prepares an Activity Report according to the Atomic Act on the results of ÚJD SR activities and on the safety of nuclear facilities in the SR for the past year, submitted to the Government meeting and to the National Council of the SR. An Annual Report is published in the Slovak-English version. The Annual Report is published on the ÚJD SR website.

ÚJD SR places extraordinary emphasis on communication with the public in the region with nuclear installations, striving for continuous improvements in a form of cooperation with Civic Information Commission, the representatives of municipalities, as well as by distribution of information materials, such as annual reports, leaflets and by making contributions to the regional press and TV.

In cooperation with Civic Information Commission or with the municipalities discussions are being organized with the public both on nuclear safety, as well as radioactive waste management.

Every year ÚJD SR informs Slovak press agencies, daily newspapers and electronic media about its domestic and foreign activities and organizes press conferences for journalists. ÚJD SR, together with the State Authority for Nuclear Safety of the Czech Republic (SÚJB) is a publisher of specialized magazine, “Safety of the Nuclear Power Engineering“, focusing on presenting the latest knowledge in the field of nuclear safety in the SR and in the Czech Republic.

With regard to emergency preparedness the district offices and the municipalities according to the Act No. 42/1004 Coll. on civil protection of the public publish information for the public on the web site or on a public information board, while there is a 30 days period, during which the affected public may file comments. Justified comments are adequately taken into account when developing a public protection plan. Information are reviewed and updated as needed; they are published in the updated form at least once in three years. Information for the public include in particular information on the source of threat, information on the possible extent of an extraordinary event and consequences on

the affected area and on the environment, hazardous properties and identification of substances and preparations that may cause an incident, information about the method of warning the public and on rescue works, tasks and measures after an extraordinary event, details on where to obtain further information relating to the public protection plan. Bodies of state administration and of self-government publish manuals for the public containing advice for the public, the aim of which is to provide as much information as possible on how to proceed and how to behave in case of natural disasters, accidents or disasters. Since 1999 the Ministry of Interior of the Slovak Republic has been publishing a non – fiction periodical, Civil protection, a review for the civil protection of the public. It is addressed to all those, who are actively involved in fulfilment of tasks resulting from Act No. 42/1994 Coll., but also to all readers, who are interested in the issues of civil protection. In the individual columns, the revue provides current information on the practical implementation of civil protection tasks, etc., publishes methodological annexes for the training and education of the mayors of municipalities, methodologies for the preparation of practical deployment of crisis management bodies, members of the civil protection staff, for the preparation of the population for self-protection and mutual help.

Separate room is given also to the self-government.

Following the amendment of the Act No. 24/2006 Coll., in 2010 and in 2014 the term “public” was broadened in such a way that it includes any natural or legal person or their organizations and groups. The public concerned is the public that is affected or likely to be affected by the given proceeding. Sections 24 and 25 govern the public participation and of the public concerned in the proceedings pursuant to the EIA law, including ensuring participation in the licensing procedure, which follows and which is governed by special regulations. The public is informed of the proceedings through a website of the competent authority. The public concerned has a status of a party in the screening procedure and in the procedure of environmental impacts assessment and consequently a status of a party in the licensing procedure regardless of its legal interest in the matter.

The public concerned is the public affected or likely to be affected by the given proceedings concerning the environment or is interested in such proceedings.

The law regulates public participation and participation of the public concerned in the proceedings including ensuring participation in the licensing procedure.

The public concerned has the status of a party in the screening procedure and in procedures for assessing the environmental impacts and consequently the status of a party in the licensing procedure regardless of its legal interest in the matter.

The public is informed of the proceedings through the web site of the competent authority. The public has a right to express an interest in the proposed activity by filing a written opinion or comments, as well as the right to appeal, for example against the final opinion issued by MŽP SR.

Subsequently the public may participate and file an appeal also in the subsequent licensing procedure under the Atomic Act.

K Implementation of the national programme (art. 11 and 12)

Art. 11

1. *Each Member State shall ensure the implementation of its national programme for the management of spent fuel and radioactive waste ('national programme'), covering all types of spent fuel and radioactive waste under its jurisdiction and all stages of spent fuel and radioactive waste management from generation to disposal.*
2. *Each Member State shall regularly review and update its national programme, taking into account technical and scientific progress as appropriate as well as recommendations, lessons learned and good practices from peer reviews.*

Art. 12

1. *The national programmes shall set out how the Member States intend to implement their national policies referred to in Article 4 for the responsible and safe management of spent fuel and radioactive waste to secure the aims of this Directive, and shall include all of the following:*
   a) *the overall objectives of the Member State's national policy in respect of spent fuel and radioactive waste management;*
   b) *the significant milestones and clear timeframes for the achievement of those milestones in light of the over- arching objectives of the national programme;*
   c) *an inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of the radioactive waste and spent fuel in accordance with appropriate classification of the radioactive waste;*
   d) *the concepts or plans and technical solutions for spent fuel and radioactive waste management from generation to disposal;*
   e) *the concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term;*
   f) *the research, development and demonstration activities that are needed in order to implement solutions for the management of spent fuel and radioactive waste;*
   g) *the responsibility for the implementation of the national programme and the key performance indicators to monitor progress towards implementation;*
   h) *an assessment of the national programme costs and the underlying basis and hypotheses for that assessment, which must include a profile over time;*
   i) *the financing scheme(s) in force;*
   j) *a transparency policy or process as referred to in Article 10;*

k) if any, the agreement(s) concluded with a Member State or a third country on management of spent fuel or radioactive waste, including on the use of disposal facilities.

2. The national programme together with the national policy may be contained in a single document or in a number of documents.

National Programme (historical overview)

The Slovak Government approved the "Strategy for the back-end of the nuclear energy in the SR" by its Resolution No. 328 at its session held on 21 May 2008.

Provisions of Section 3 par. 2 sub-par. d) of the Act No. 238 on the NNF requires the Board of Trustees of NNF to submit a draft Strategy update to the Ministry of Economy every five years.

The updated document was made public on the web pages of the MŽP SR, MH SR and the NNF (including in mass media) in late 2012. The above mentioned web sites published the entire updated "Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic".

During the screening procedure no comments have been delivered on the Notice of a strategic document having national importance: The "Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic". The public did not comment during the screening procedure specifically. A public hearing was held on 22 January 2013.

The Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic was approved by the Government by its resolution No. 26/2014.

Following the publication of the Council Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste and its transposition by the Act No. 143/2013 Coll. the Board of Trustees of NNF decided to prepare an update of the document "Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic".

The Ministry of Economy, in cooperation with the Ministry of Environment according to the Act No. 24/2006 Coll. and after the completion of the screening procedure issued a decision that the update of the "Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic "shall no longer be reviewed according to the Act No. 24/2006 Coll. on environmental impact assessment.

The updated "Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic" according to the Act No. 143/2013 Coll. (transposing Directive No. 2011/70/Euratom) was approved by the Government resolution No. 387/2015 entitled National Policy and the National Programme which replaced the previously valid "Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic".

The National Programme for management of SNF and RAW is based on the documents:

- the National Policy for the management of SNF and RAW,

- the “Strategy for the back-end of peaceful uses of nuclear energy in the Slovak Republic“ approved by the Government Resolution No. 26/2014,
- Supporting documentation submitted by the license holders for the management of SNF and RAW and decommissioning of NIs.

Contents of National Programme

The document “National Programme for management of spent nuclear fuel and radioactive waste“ (www.economy.gov.sk) contains, inter alia the following objectives (targets):

1. Decommissioning of nuclear installations
2. Spent nuclear fuel and radioactive waste management
3. Access to repositories of radioactive waste and spent nuclear fuel after their closure
4. The need for research, development and demonstration activities
5. Responsibilities, monitoring implementation
6. The cost plan for decommissioning, management, financing scheme
7. Transparency – public information
8. International treaties on the management of spent nuclear fuel and radioactive waste
9. Projected impacts of contributions and levies on electricity prices, prices of other goods and services on the economic and social development of the State
10. Projected impacts of contributions and levies to the competitiveness of electricity producers in nuclear installations on the electricity market in the SR, internal electricity market of the EU
11. The impact of the national programme on balance and operational reliability of the energy system of the Slovak Republic in the EU
12. Opinions of state administration authorities in the field of public health in terms of radiation protection and health protection, and the opinion of MŽP SR in terms of impacts of programme implementation on the environment

Significant targets and the timeframes for achieving these targets with regard to the general objectives of the national programmes

Background

The targets are determined primarily on the historical development which can be summarized as follows:

- Since 1999 ongoing decommissioning of NPP A1 with the need to resolve management of atypical radioactive waste, which due to their content of long-lived radionuclides and higher levels of other safety significant radionuclides cannot be disposed in the existing National Repository;
- NPP V1 has been in decommissioning since 2011;

- Available RAW repository, where disposable very low level and low-level operational RAW from the VVER power plants and disposable waste from their decommissioning can be disposed, when considering the planned operating life;
- No deep disposal repository available for disposal of SNF, as well as intermediate level of RAW and high-level RAW,
- Centralized collection of RAW started to operate; most of them are disposable in the National Repository in Mochovce,
- Sufficient technological base is in operation for treatment and conditioning of radioactive waste,
- Spent fuel is stored in the ISFS. The capacity of ISFS is currently not sufficient to store all SNF (its capacity will be sufficient until 2023 – 2024). Due to lack of capacity of ISFS it will be necessary to build and put into operation new storage capacities for SNF,
- The operator of nuclear power plants declared his intent to operate the existing NPPs for a period of 60 years;
- Due to the fact that the development and a deep geological repository has been suspended for 12 years; mainly the outputs regarding selection of the repository site would be useful,
- After its establishment, JAVYS, a. s. became responsible for activities that should lead to implementation of a deep geological repository,
- The preparatory phase of the project for a new nuclear power plant is ongoing in the Jaslovské Bohunice site and the operation of a new NPP being connected to the grid is considered in the horizon of 2029 and a period of operation of 60 years;
- The whole issue of the back-end of peaceful uses of nuclear energy is currently sufficiently covered by legislation.

Significant milestones and the timeframes for their achievement are shown in the Table below:

No.	Measure	Deadline	Responsible
For the area of infrastructure and legislation			
1.	Amend the law on the National Nuclear Fund in a principal manner and other related pieces of legislation, in order to: - Ensure that the State assumed responsibility for decommissioning, management of RAW from decommissioning and for the long-term storage of SNF, - Ensure that the amendment introduced a secure way of transferring nuclear facilities by the operator to the organization entrusted by the State for decommissioning, - Ensure that the level of contributions and payments to the NNF is determined by an independent body (NNF) under the rules specified by the legislation, - Ensure that the recipient of NNF funds submitted to NNF eligible costs within the scope and dates given by the legislation, - Ensure that the scope and the structure of eligible costs for activities of back-end of nuclear energy cycle is defined by the legislation, - Ensure that also the operator of non-reactor nuclear facilities makes payments to NNF in order to finance their decommissioning.	2018	MH SR
In the field of decommissioning of nuclear installations			

No.	Measure	Deadline	Responsible
2.	Finalize stage II of NPP A1 decommissioning	2016	JAVYS, a.s.
3.	Implement the next stages of NPP A1 decommissioning	2033	JAVYS, a.s.
4.	Implement stage II of NPP V1 decommissioning	2025	JAVYS, a.s.
5.	Utilize funding from the BIDSF in a maximal extent for projects of decommissioning NPP V1	2025	JAVYS, a.s.
6.	Prepare decommissioning of other NIs	permanent	JAVYS, a.s. SE, a.s.
In the field of radioactive waste and spent fuel management in general			
7.	Build and put into operation an Integrated RAW storage facility in Jaslovské Bohunice	2018	JAVYS, a.s.
8.	Build new storage capacities for SNF	2020	JAVYS, a.s.
9.	Create a database of all radioactive waste from nuclear facilities in the SR and ensure its continuous update	2016	JAVYS, a.s. in cooperation with MH SR and competent regul.bodies
10.	Build a facility for remelt of metal radioactive waste	2018	JAVYS, a.s.
11.	Build and put into operation a facility for IRAW and ZRAM management	2016	JAVYS, a.s.
In the field of radioactive waste and spent nuclear fuel disposal			
12.	Build a repository for very low-level waste	2018	JAVYS, a.s.
13.	Build additional storage structure after filling the second double row at the National RAW Repository	2018	JAVYS, a.s.
14.	Take a decision to continue or stop the double path in development of deep geological disposal – to comprehensively assess the idea of shared international deep repository	2020	MH SR
15.	Develop a plan for next stages of renewed development of deep geological disposal	2016	JAVYS, a.s.
16.	Decision on siting the deep geological repository of the SR (in case of cancelling the dual path)	2030	JAVYS, a.s.
17.	Putting the deep geological repository in operation	≈ 2065	JAVYS, a.s.
In the field of Research and Development			
18.	Develop a framework programme for R&D in the field of deep geological disposal and create internal conditions for its implementation	2018	JAVYS, a.s.
In the field of transparency			
19.	Create and prepare the implementation of a system of economic stimulus for sites affected by the development and operation of repositories Focus only on economic stimulus of sites is not sufficient. There should be a system for informing and working with the public in long-term.	2018	MH SR JAVYS, a.s. National Nuclear Fund

Development of a Deep Geological Repository

Directive 2011/70/Euratom recommends that each EU State with a nuclear programme had a comprehensive vision and plans for disposing all types of RAW and SNF, which are produced in the given State, including the creation of resources for implementation. The present document established for disposal of SNF and RAW not disposable in the National Repository this double path:

- Disposal in a deep geological repository in the SR,
- Monitoring and support for building an international repository.

Sub-activities:

1. Development and preparation of a deep geological repository built in the SR.
2. Ensure and guarantee professional and safe solution of a deep geological repository:
- Characterization of the geological properties of selected sites,
- Development of geological models of selected sites,
- Directing geological works to select a suitable site,
- Providing important geological information for solving safety analyses.
3. Cooperation in development of an international repository, if the international repository is feasible, involvement in implementation of international scientific and research projects.
4. When updating this programme to evaluate the development of an international repository and based on the evolution to decide whether the Slovak Republic will continue in the cooperation on the international repository.

Public Participation

- Ensure public information in the field of RAW and SNF management and to ensure public participation in the decision-making process in accordance with applicable legislation.
- Create and prepare the implementation of a system of economic stimulus for sites affected by the development and operation of repositories.

Evaluation of the implementation of program sub-objectives

The implementation of individual sub-objectives is assessed in the framework of the periodic annual reports on the implementation of the National Program elaborated in cooperation with the National Nuclear Fund, JAVYS, a.s. and SE, a.s., and submitted for assessment to the MH SR together with the ÚJD SR´s opinion. An assessment of the implementation of the above-mentioned sub-objectives 1 to 19, as well as the objectives for the development of a deep geological repository as of 31 December 2017, is the following:

1. Fundamentally amend the Act on the National Nuclear Fund and other related documents by the end of 2016

The draft new law on the National Nuclear Fund was submitted to the meeting of top management of MH SR in April 2017. On the basis of comments received from the Energy Employers´ Association to the amount of contributions of the obliged entities to the National Nuclear Fund under the draft new law, the approval of the law was interrupted following a preliminary commenting procedure, and the activity of the task force composed of representatives of all stakeholders was renewed for the joint approval of the input parameters and the procedure to set the amount of mandatory contributions and compulsory payments to the NNF, as well as the necessary modifications to the text of the law and related documents. As at 31 December 2017, the key input parameters, such as the costs of a deep geological repository, the period of operation of NPP, as well as macroeconomic parameters were agreed and a methodology for setting the amount of mandatory contributions and compulsory

payments to the NNF. The inter-ministerial commenting procedure on the draft law was renewed in June 2018, with the expected date of approval of the bill so that it becomes valid from 1 January 2019.

2. Complete the stage II of decommissioning of A1 NPP

The task was completed as at 31 December 2016. From 1 January 2017, stage III and IV of decommissioning of A1 NPP is implemented.

3. Implement the following stages of decommissioning of A1 NPP by the end of 2033

In the framework of the implementation of the continuous decommissioning process of A1 NPP, from 1 January 2017 stages III and IV of decommissioning are in implementation, with the scheduled date of completion in 2024, based on the ÚJD SR Decision No. 369/2016, which granted a permit for the implementation of stages III and IV in the scope indicated in the document "Plan for stages III and IV of decommissioning of A1 NPP". The follow-up stage V of decommissioning is scheduled for the period 2025 – 2033.

The main subject of stages III and IV is the decommissioning of technological equipment and rooms of objects 30 – reactor hall, 32 – intermediate machinery hall, 34 – turbine hall and the main generating unit, external objects, such as object 28 – gas management system, tanks of object 44/10 and treatment of liquid RAW, especially Chrompik and sludge, as well as handling contaminated soil and concrete.

Continuous monitoring of progress in the decommissioning project takes place at the technical level within individual tasks, as well as through monthly reports submitted by the contractor and approved by JAVYS, a. s. These reports are presented at regular monthly project management meetings.

4. Implement stage II of decommissioning of V1 NPP by the end of 2025

Implementation of stage II of decommissioning of V1 NPP started on 1 January 2015 on the basis of ÚJD SR Decision 900/2014 issued on 23 December 2014. Implementation of stage II of decommissioning of V1 NPP is in line with the approved plan for stage II and is scheduled until 31 December 2025. Decommissioning of V1 NPP is implemented through sub-projects.

The most important activities in 2017 include the completion of the construction of an Integral Storage Facility, the start of demolition of cooling towers, the completion of the second stage of decontamination of the primary circuit, the continuation of construction of new disposal areas in RÚ RAO and the signing of a contract and the start of project preparation for the dismantling of large scale components of the primary circuit.

The current state of decommissioning of V1 NPP as at 31 December 2017 is in line with the decommissioning schedule for decommissioning, with some delay in certain projects against the schedule from 2014. Nevertheless, it is assumed that the main objective of decommissioning V1 NPP will be fulfilled by the end of 2025. The progress of the overall procedure, as well as of individual projects is monitored continuously through monthly, as well as six-months reports and meetings of the

managing staff of individual BIDSF projects, representatives of the consultant and representative of EBRD, and also through the monitoring committee meetings that take place twice a year with the participation of JAVYS, a. s., SIEA, NNF, MH SR, representative of EBRD and the European Commission.

5. Maximum use of funds from the BIDSF for the V1 NPP decommissioning projects

As of 31 December 2017, EBRD approved a total of 18 Grant Agreements for a total of Euro 467 million, where a cumulative volume of Euro 258.5 million was drawn for decommissioning projects of V1 NPP as at 31 December 2017. The amount of committed EU funds provided through SIEA amounts to Euro 26 million, of which Euro 0.34 million was drawn as at 31 December 2017.

Out of the total of 81 decommissioning projects of V1 NPP, as of 31 December 2017, 67 projects were financed mostly from the EU funds.

The total estimated decommissioning costs for V1 NPP (expressed in the price level of 2017 and excluding the costs of SNF storage and the share of the costs of development, construction and operation of a deep geological repository, as well as other costs related to the decommissioning of V1 NPP) represent Euro 1,237 million, with an amount of Euro 671 million to be funded by the EU.

6. Prepare decommissioning of other nuclear installations

The procedures, time schedules and the costs of decommissioning of other NIs are set out in the conceptual decommissioning plans of the respective nuclear installations that are developed in accordance with the requirements of the Atomic Act, and the ÚJD SR Decree No. 58/2006 Coll.

In 2017, EBO V2 NPP and EMO 1&2 NPP conceptual decommissioning plans were updated, as a result of updated database of NPP facilities, as one of the main inputs for setting the costs of decommissioning according to the ISDC structure, while these conceptual decommissioning plans were developed for the period of operation of V2 NPP and EMO 1&2 NPP for 60 years, which means closure of operation of V2 NPP in 2045 and for EMO 1&2 NPP in 2061.

In order to determine the costs of decommissioning of non-reactor facilities, as part of the methodology for calculating the amount of compulsory payments to the NNF, conceptual plans for decommissioning of other nuclear facilities, such as electricity generating facilities, have been developed.

7. Build and commission the Integral Storage Facility for RAW in Jaslovské Bohunice by the end of 2018

In 2017, the construction of the Integral Storage Facility for RAW was completed, the commissioning was based on the ÚJD SR Decision dated 10 October 2017 and the approval decision and permit for use was issued.

8. Build a new storage capacity for SNF by the end of 2020

The construction of new storage capacities for the SNF, as a necessary condition for the safe operation of nuclear units in the SR, was assessed within the framework of the process under Act 24/2006 Coll. on environmental impacts assessment as amended, based on which the Ministry of Environment issued its final opinion in 02/2016 recommending its implementation of the proposed activity “Completion of the storage capacity for SNF in Jaslovské Bohunice site“.

In 2017, development of documentation for the submitting the application for building permit with an expected date of issuing the building permit of 10 June 2019 and the date of completion of storage capacity with a subsequent trial operation from 2020 to 2021.

9. Create a database of all radioactive waste from nuclear facilities in the SR and ensure its continuous update by the end of 2016

The database was developed by JAVYS, a.s. as at 31 December 2016 and its continual update is secured, the task is fulfilled.

10. Build a facility for melting metallic radioactive waste by the end of 2018

Plant for melting metallic RAW, the preparation for implementation started in 2016, in 2017 it was in the phase of design and getting permit for construction. The building permit was issued in December 2017. Then the implementation project documentation and implementation work programs were developed.

The project is implemented as part of the decommissioning projects of V1 NPP (C7-A4) with the share of financing 19 % from the BIDSF and 81 % from the NNF and JAVYS, a.s. funding. Completion including the tests is planned by the end of 2018.

A contract with selected contractor was concluded in 2017, and preparation of investment project and the preparation of design documentation for obtaining the building permit, as well as the documentation for the operational design. ÚJD SR issued a decision on 6 December 2017 with a building permit. In the first half of 2018, work was done to prepare the premises for installation of the equipment, the delivery of the melting furnace itself and the engineering of the related technological equipment with the expected date of assembly in the second half of 2018 and the complex testing of the equipment by the end of 2018.

11. Build and put into operation Facility for management of IRAW and ZRAM by the end of 2016

The facility for the management of IRAW and ZRAM built in the premises of RAW repository in Mochovce site was put into operation in February 2016, and is used for storage of captured radioactive materials and IRAW. The task is fulfilled.

12. Build a low-level waste repository by the end of 2018

The first module of very low-level waste repository for VLLW from A1 NPP was part of the National Repository for RAW built and put into operation in 06/2016. In 2017, the second module of disposal boxes was constructed for VLLW from V1 NPP as part of BIDSF project C9.4. The second module

(storage boxes with a system of barriers prepared for overlay with sliding shelter) was completed in September 2017 and in October, after testing, it was handed over to the operator of the National Repository for RAW. In December 2017 its approval process took place and the approval decision was issued. The task is fulfilled.

13. Build another storage structure after filling the second double-row of the National Repository for RAW by the end of 2018

As part of the Project C9.4, preparation of the construction site was under way under the third double-row and on the basis of the building permit from 2 March 2017, construction of the third double-row of the NAO repository started. By the end of 2017, field engineering and ground improvement was done under the storage boxes and the concrete part of the structure was completed. Completion of the third double-row, including testing, is scheduled for the beginning of 2019.

14. Take a decision on the continuation or suspension of the dual path for development of a deep geological disposal – to fully evaluate the idea of a joint international deep geological repository by the end of 2020.

Based on the assumption that the location of the deep geological repository in the SR will be definitely decided by the end of 2030, the idea of an international deep geological repository remains one of the open options for the SR. It is therefore appropriate to continue in the dual path for the development of the deep geological repository and to temporarily shift the decision on the continuation or suspension of the dual path until 2030, as proposed by the MH SR when submitting a report on the implementation of the national program for the period as at 31 December 2016.

No activity was pursued in 2017 for the use of dual path, which is to develop a joint repository. the SR did not participate in activities of this nature in 2017 and did not engage in this development. All activities carried out in 2017 focused on the development of “own” deep geological repository in the SR.

15. Develop a plan for further phases of renewed development of deep geological disposal by the end of 2016

In 2016, the implementation of the project “Deep geological repository – site selection, phase 1“, including a proposal for further procedure in developing a deep geological repository in the SR”.

In 2017, a contract was concluded with a group of contractors (State Institute of Geology of Dionýz Štúr, Bratislava; ÚJV Řež, Husinec, ČR; DECOM, a. s. Trnava), who have as one their sub-tasks to submit, among other things, a detailed plan for the procedure in development of a deep geological repository in the SR for the period 2019 – 2024. Other sub-tasks that the group of contractors worked on in 2017, and whose outputs are to be presented in 2018, are in the following areas:

- Elaboration of a project of geological task,
- Creation and preparation of the implementation of a system of economic stimulation of sites affected by the development and operation of repositories; and

- Framework program for development and research in deep geological repository for all stages and for all areas of deep geological repository development.

As part of development of documentation in 2018, a technical specification for the selection of the general contractor for the further procedure in the development of deep geological repository.

16. Decide on the siting of the deep geological repository of the SR (in case of cancellation of the dual path) by the end of 2030

In the framework of the project "Deep geological repository – site selection, phase 2 – part I", in 2017 – 2018, "Project of geological task" was developed according to Act No. 569/2007 Coll. on geological works (Geological Act) as amended, and the Decree No. 51/2008 Coll., implementing the Geological Act as amended, on the basis of the previous work and documentation concerning the site selection based on selection criteria. The geological activities, fieldwork and exploration work in pre-selected locations, as well as work with the public are considered so that by 2030 (in case of cancellation of the dual path) it is possible to decide on the location of the deep geological repository.

17. Put the deep geological repository into operation by the end of 2065

The implementation of the project "Deep geological repository – site selection, phase 1", from 2016 and the project "Deep geological repository – site selection, phase 2 – part I", took place in 2017, will end in mid- 2018, and the objective is to secure the basic conditions for the steps leading to site selection for the development of deep geological repository in the SR so that in case of cancellation of the dual path it was possible to provide for the development and making the deep geological repository operational in the SR by 2065.

18. Develop a framework program for development and research in deep geological disposal and create internal conditions for its implementation by the end of 2018

As part of the implementation of the project "Deep geological repository – site selection, phase 2 – part I", running in 2017 – 2018, in accordance with the detailed plan of works for the following period, and with the proposal for further procedure in the development of a deep geological repository in the SR, a document "Framework program for development and research in the field of deep geological disposal, including the requirements for its implementation" will be developed, on the basis of which JAVYS, a. s. will create conditions for its following implementation within the required deadline.

19. Develop and prepare the implementation of the system of economic stimulation of locations affected by the development and operation of the repositories. Create a comprehensive information system and work with the public for a long period of time, by the end of 2018

A proposal for a comprehensive system of informing the public and working with the public, as well as the proposal for economic stimulation of locations affected by the development and operation of the repository, will be an output from the activity of the group of contractors by the end of 2018. After

signing the contract in July 2017, these proposals were based also on documents from 2016 and from the current experience and continuously during project meetings discussed with JAVYS, a. s.

Summarizing the evaluation of implementation of the national program and the plan for the next steps

In May 2017, the European Commission issued a report “Progress of Implementation of Council Directive 2011/70/EURATOM“, which is the first report assessing the national programs for the management of RAW and SNF prepared under the Directive 2011/70/EURATOM. This report contains basic data concerning the back-end of the nuclear fuel cycle in the SR. Although this report does not contain a specific assessment of national programs of individual countries, it is possible to identify areas for possible improvements as part of the program update, which was set for the national program of the SR after 6 years from the approval of the national program by the Slovak Government, i.e. in 2021. In November 2017, the EC organized a one-day workshop on the above mentioned report, attended by the representatives of MH SR, ÚJD SR and NNF and where some aspects of the national programs were presented and discussed. In addition to the key issue of development of deep geological repositories, the EC report highlights the aspect of monitoring national programs and their progress under Article 12 of Directive 2011/70/EURATOM, according to which it is necessary to identify responsibilities, milestones and indicators for monitoring and implementation of programs. The setting of key performance indicators and evaluation of programs´ implementation is perceived by the EC as a priority, bearing in mind own assessment of program implementation, the preparation and execution of peer reviews of national programs .

For the purpose of peer review of the national programme in the SR, it is planned to utilise the ARTEMIS mission, an expert peer review provided by the IAEA. Until then, the NNF will monitor the reports on results of similar peer reviews in other EU Member States. It is expected that the conclusions and recommendations from the peer review of the national program will also contribute to improvements as part of its update. Also, the information obtained from studying the programs of other Member States will be a source of incentives for the update of the national program of the SR in addition to the planned update of the economic part and taking into account the technical and scientific progress in the area of decommissioning of nuclear facilities and the management of SNF and RAW.

L PEER REVIEWS AND SELF-ASSESSMENTS (art 14.3)

3. *Member States shall periodically, and at least every 10 years, arrange for self-assessments of their national framework, competent regulatory authority, national programme and its implementation, and invite international peer review of their national framework, competent regulatory authority and/or national programme with the aim of ensuring that high safety standards are achieved in the safe management of spent fuel and radioactive waste. The outcomes of any peer review shall be reported to the Commission and the other Member States, and may be made available to the public where there is no conflict with security and proprietary information.*

International Peer Reviews are described in chapter F.4 above.

The National Program of the SR is periodically reviewed through the reports elaborated by the NNF in cooperation with the entities concerned and is submitted to the MH SR. The reports together with ÚJD SR opinions are available on the NNF website.

M FUTURE PLANS TO IMPROVE SAFE AND RESPONSIBLE MANAGEMENT OF SPENT FUEL AND RADIOACTIVE WASTE

In the coming period, the following measures are planned:

- Construction of a third double-row for low level radioactive waste in the National Repository for RAW,
- Expanding the capacity of the current ISFS by completing the storage capacity for SNF,
- Construction of a plant for melting metal RAW in Jaslovské Bohunice;
- Continue the implementation of stage III and IV of decommissioning of A1 NPP;
- Continue in implementation of stage II of decommissioning of V1 NPP;
- Ensure the optimization of treatment capacity of TSÚ RAW in relation to the current requirements in the field of RAW management,
- Continue in the implementation of design change in the water purification systems at Mochovce NPP 1&2, which will allow the sampling of sorbents to optimize their extraction;
- Change in the system of treatment liquid radioactive concentrates in Mochovce NPP.

N ANNEXES

I. List of Nuclear Facilities for Spent Nuclear Fuel (SNF) and Radioactive Waste (RAW) Management

II. Matrix

III. Inventory of Stored Spent Nuclear Fuel (t ŤK) (as at 31 December 2017)

IV. Inventory of Stored RAW (as at 31 December 2017)

V. List of National Laws and implementing legislation

VI. List of ÚJD SR Guidelines

Annex I. List of Nuclear Facilities for Spent Nuclear Fuel and Radioactive Waste (RAW) Management

Slovenské elektrárne, a. s. (SE, a. s.) operates:

- Nuclear Power Plants Jaslovské Bohunice, NPP V2 - Units 3 & 4
- Nuclear Power Plants Mochovce, Units 1 & 2

Jadrová a vyraďovacia spoločnosť, a. s. (JAVYS, a. s.) operates:

- Interim Spent Fuel Storage (ISFS) at Jaslovské Bohunice
- Technologies for RAW Treatment and Conditioning (TSÚ RAW) at Jaslovské Bohunice;
- Integral Storage of Radioactive Waste (IS RAW);
- National RAW Repository Mochovce;
- Final Treatment of Liquid RAW Mochovce.

List of Nuclear Installations in Decommissioning

Jadrová a vyraďovacia spoločnosť, a. s. (JAVYS, a. s.):

- Nuclear Power Plant Jaslovské Bohunice - NPP A1 (incl. Technology for RAW management from this NPP installed within its premises),
- Nuclear Power Plant Jaslovské Bohunice - NPP V1 (Units 1and 2).

Annex II. Matrix

Type of Liability	Long term Management Policy	Funding of Liabilities	Current Practice / Facilities	Planned Facilities
Spent Fuel	Geological disposal or multilat. solution	National Nuclear Fund	Long term storage	Geological Disposal
Nuclear Fuel Cycle Waste	Geological / surface disposal	National Nuclear Fund	Disposal of LLW	Geological disposal for HLW
Application Wastes	Under approval	Re-export or financial guarantee	Storage	Disposal (with some exceptions)
Decommissioning Liabilities	Immediate decommissioning	National Nuclear Fund	Immediate decommissioning	Low active soil and concrete debris dispos. facility
Disused Sealed Sources	Disposal	Re-export or financial guarantee	Storage	Disposal (with some exceptions)

Annex III. Inventory of Stored Spent Nuclear Fuel (t ŤK) (as at 31 December 2017)

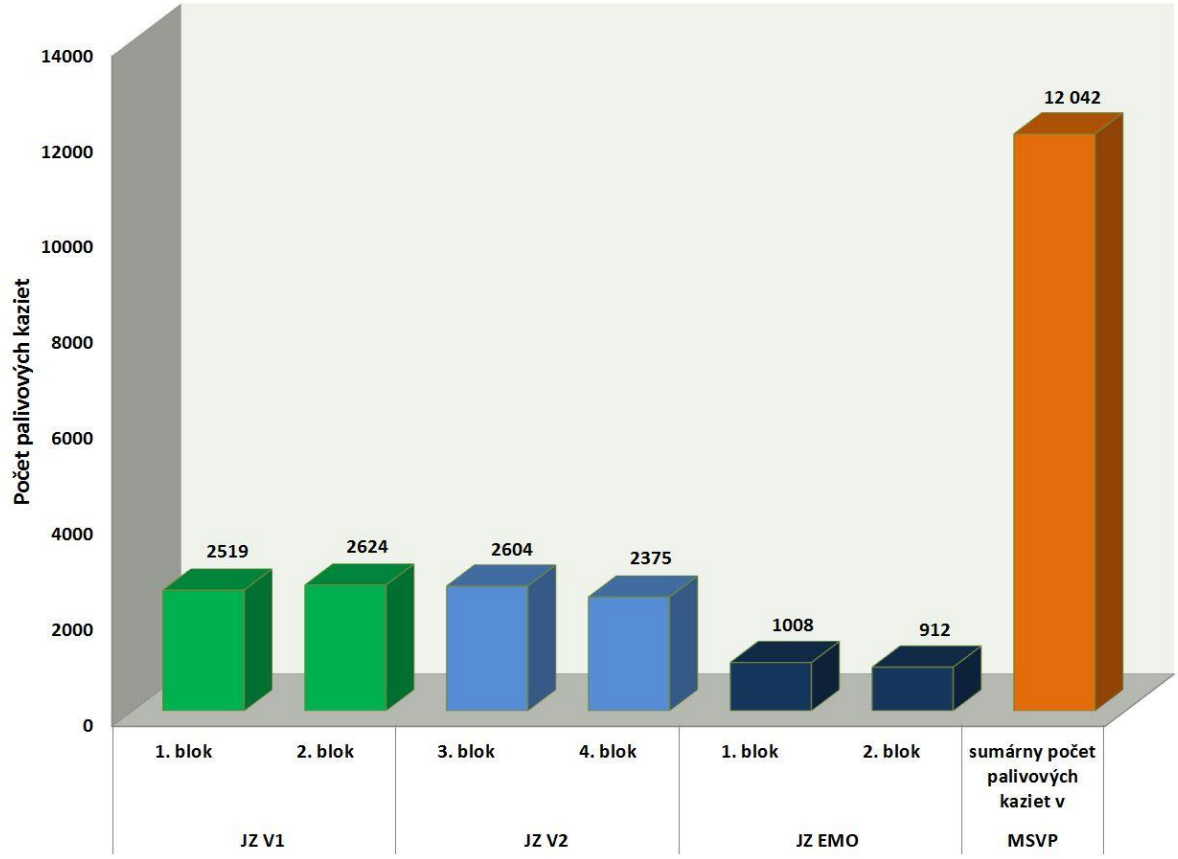
Inventory of Stored Spent Nuclear Fuel (as at 31 December 2017)

The ISFS of JAVYS, a. s. as at 31 December 2017 stored 12,042 SNF from the production of NI V1, V2 and NPP Mochovce, in the following breakdown:

- 5,143 fuel assemblies produced by reactor Units of NI V1,
- 4,979 fuel assemblies produced by reactor Units of NI V2,
- 1,920 fuel assemblies produced by reactor Units of NI Mochovce.

The maximal design storage capacity of ISFS 14,112 of SNF has been used up to 85.3 %.

Quantity of SNF disposed in ISFS structured by individual NIs and Units



The SNF storage pools in NPP V2 and NPP Mochovce, as at 31 December 2017 there were 1,345 SNF assemblies stored, in the following breakdown:

- 613 fuel assemblies from the production of reactor Units of NPP V2;
- 732 fuel assemblies from the production of reactor Units of NPP Mochovce.

Annex IV. Inventory of stored RAW (as at 31 December 2017)

Criteria Used to Define and Classify Waste

According to the Act No. 541/2004 Coll. (Atomic act) radioactive waste shall mean any unusable material in gaseous, liquid or solid form, which due to the content of radio-nuclides or due to the level of their contamination with radionuclides cannot be released into the environment.

Classification of radioactive waste is based on their ability to be disposed and is defined in Section 5 of Decree of UJD SR No. 30/2012 Coll., setting the details of requirements for handling nuclear materials, radioactive waste and spent nuclear fuel. According to this Decree RAW is divided by activity into the following categories: (by IAEA Safety Guide GSG-1 Classification of Radioactive Waste).

Clearance levels allowing release into the environment of individual radionuclides are listed in Annex 5 of the Act No. 87/2018 Coll. on radiation protection.

Transposition table for the types of Radioactive Waste		
UJD SR Decree No. 30/2012 Coll.	**IAEA Safety Guide GSC-1**	
	Exempt waste (EW): *Waste that meets the criteria for clearance, exemption or exclusion from regulatory control for radiation protection purposes as described in Ref. [6].*	
Transient radioactive wastes *whose activity falls below the limit value for their introduction to the environment during storage;*	***Very short lived waste (VSLW):*** *Waste that can be stored for decay over a limited period of up to a few years and subsequently cleared from regulatory control according to arrangements approved by the regulatory body, for uncontrolled disposal, use or discharge. This class includes waste containing primarily radionuclides with very short half-lives often used for research and medical purposes.*	5,900 m^3 + 38,996 kg

Very low-activity radioactive waste, whose activity is slightly higher than the limit value for their introduction to the environment, contain mainly radionuclides with a short half-life, or also a low concentration of radionuclides with a long half-life, and which during storage require a lower degree of isolation from the environment through a system of engineered barriers, as in the case of surface-type radioactive waste repositories;	***Very low level waste (VLLW)**: Waste that does not necessarily meet the criteria of EW, but that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near surface landfill type facilities with limited regulatory control. Such landfill type facilities may also contain other hazardous waste. Typical waste in this class includes soil and rubble with low levels of activity concentration. Concentrations of longer lived radionuclides in VLLW are generally very limited.*	26,631.334 m^3 + 3,768 kg
***Low-activity radioactive waste**, whose average specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, is less than 400 Bq/g, maximum specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, is locally less than 4000 Bq/g, does not produce residual heat, and following treatment meet safe operating limits and conditions for surface-type radioactive waste repositories;*	***Low level waste (LLW):** Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration, and also long lived radionuclides, but only at relatively low levels of activity concentration.*	23,249.172 m^3 + 546 barrels + 468 pallets + 464 filters
***Medium-activity radioactive waste**, whose average specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, is equal to or over 400 Bq/g,*	***Intermediate level waste (ILW):** Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no*	24.49 m^3 + 27,241 kg

may produce residual heat and measures for its removal are less than in the case of highly active radioactive waste, and which following treatment do not meet safe operating limits and conditions for surface-type radioactive waste repositories;	*provision, or only limited provision, for heat dissipation during its storage and disposal. ILW may contain long lived radionuclides, in particular, alpha emitting radionuclides that will not decay to a level of activity concentration acceptable for near surface disposal during the time for which institutional controls can be relied upon. Therefore, waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.*	
***Highly-active radioactive waste**, whose average specific activity of radionuclides with a long half-life, especially radionuclides emitting alpha radiation, exceeds values specified for low-activity radioactive waste requiring measures for the removal of residual heat and can be deposited only in an underground-type radioactive waste repository.*	***High level waste (HLW):** Waste with levels of activity concentration high enough to generate significant quantities of heat by the radioactive decay process or waste with large amounts of long lived radionuclides that need to be considered in the design of a disposal facility for such waste. Disposal in deep, stable geological formations usually several hundred metres or more below the surface is the generally recognized option for disposal of HLW.*	

Spent nuclear fuel is not considered as high-level radioactive waste.

Annex V. List of Selected National Laws and implementing legal regulations

- Act No. 71/1967 Coll. on Administrative Procedure (správny poriadok) – the latest amendment as Act No. 238/2017 Coll.
- Act No. 50/1976 Coll. on spatial planning and the construction code (the Construction Act) – the latest amendment as Act No. 247/2015 Coll.
- Act No. 42/1994 Coll. on civil protection of the population – the latest amendment as Act No. 125/2016 Coll.
- Act No. 56/2018 Coll. on assessment of product conformity, making the product available on the market and amending certain laws.
- Act No. 55/2018 Coll. on the provision of information on technical regulations and on obstacles to the free movement of goods.
- Act No. 575/2001 Coll. on organization of government activities and on organization of the central state administration – the latest amendment as Act No. 112/2018 Coll.
- Act No. 215/2004 Coll. on protection of classified information and on amendments to certain laws – the latest amendment as Act No. 69/2018 Coll.
- Act No. 220/2004 Coll. on protection and utilization of agricultural land and on amendment to Act No. 245/2003 Coll. on integrated prevention and on environmental pollution control and on amendments to certain laws as amended – last amendment, Act No. 254/2015 Coll.
- Act No. 541/2004 Coll. on the Peaceful use of nuclear energy (the Atomic Act) and on amendment and alternations of several acts as amended – the latest amendment as Act No. 87/2018 Coll.
- Act No. 251/2012 Coll. on energy sector and on amendments and complements to certain laws – the latest amendment as Act No. 315/2016 Coll.
- Act No. 24/2006 Coll. on environmental impact assessment and on amendments to certain laws as amended – the latest amendment as Act No. 142/2017 Coll.
- Act No. 124/2006 Coll. on occupational health and safety and on amendments to certain laws – the latest amendment as Act No. 378/2015 Coll.
- Act No. 125/2006 Coll. on labour inspection and on amendment to Act No. 82/2005 Coll. on undeclared work and illegal employment and on amendments to certain laws – the latest amendment as Act No. 82/2017 Coll.
- Act No. 355/2007 Coll. on protection, support and development of public health and on amendments and complements to certain laws – the latest amendment as Act No. 87/2018 Coll.
- Act No. 87/2018 Coll. on radiation protection and on amendments to certain laws.

- Act No. 238/2006 Coll. on the National Nuclear Fund for decommissioning of nuclear installations and on spent nuclear fuel and radioactive waste management (Act on Nuclear Fund) and on amendments to certain laws – the latest amendment as Act No. 87/2018 Coll.
- Act No. 309/2009 Coll. on promotion of renewable sources of energy and high efficiency cogeneration and on amendments to certain laws – last amendment Act No. 268/2017 Coll.
- Act No. 254/2011 Coll. on transportable pressure equipment and on amendments to certain laws as amended by Act No. 56/2018 Coll.
- Act No. 250/2012 Coll. on regulation in network industries – the last amendment of Act No. 164/2017 Coll.
- Act No. 133/2013 Coll. on building products and on amendments to certain laws as amended by Act No. 91/2016 Coll.
- Act No. 54/2015 Coll. on civil liability for nuclear damage and on its financial coverage and on amendments to certain laws.
- Government Ordinance No. 117/2018 Coll., which repeals the Government Ordinance No. 35/2008 Coll. laying down the details of technical requirements and conformity assessment procedures for personal protective equipment.
- Government Ordinance No. 149/2016 Coll. on equipment and protective systems intended for use in potentially explosive atmospheres.
- Government Ordinance No. 234/2015 Coll. on making available simple pressure vessels on the market.
- Government Ordinance No. 1/2016 Coll. on making available pressure equipment on the market.
- Government Ordinance No. 148/2016 Coll. on making available electrical equipment intended for use within certain voltage limits on the market.
- Government Ordinance No. 436/2008 Coll. laying down the details of technical requirements and conformity assessment procedures for machinery – as amended by Government ordinance No. 140/2011 Coll.
- Government Ordinance No. 127/2016 Coll. on electromagnetic compatibility.
- Government Ordinance No. 276/2006 Coll. on minimal safety and health requirements for work with display units.
- MZ SR Decree No. 99/2018 Coll. on radiation protection.
- MZ SR Decree No. 101/2018 Coll., laying down details of the provision of radiation protection in medical exposure.
- MZ SR Decree No. 96/2018 Coll., laying down the details of the operation of the radiation monitoring network.

- MZ SR Decree No. 98/2018 Coll. on the limitation of exposure of workers and residents from natural sources of ionizing radiation.
- MZ SR Decree No. 100/2018 Coll., laying down the details for limiting exposure from drinking water, natural mineral water and spring water.
- Government Ordinance No. 387/2006 Coll. on requirements for ensuring safety and health signs at work as amended by Government Ordinance No. 104/2015 Coll.
- Government Ordinance No. 391/2006 Coll. on minimal safety and health requirements for a workplace.
- Government Ordinance No. 392/2006 Coll. on minimal safety and health requirements when using work equipment.
- Government Ordinance No. 393/2006 Coll. on minimal requirements for safety and health at work in potentially explosive environment.
- Government Ordinance No. 395/2006 Coll. on minimal requirements for provision and use of personal protective equipment.
- Government Ordinance No. 396/2006 Coll. on minimal safety and health requirements for a construction site.
- Government Ordinance No. 312/2007 Coll. laying down the details on the method of collection and payments of mandatory contribution to the National Nuclear Fund for decommissioning of nuclear installations and for spent nuclear fuel and radioactive waste management as amended by Government Ordinance No. 145/2012 Coll.
- SÚBP Decree No. 59/1982 Coll., setting out the basic requirements to ensure safety at work and safety of technical equipment as amended by SÚBP Decree No. 484/1990 Coll.
- SÚBP Decree No. 25/1984 Coll. to ensure safety at work in low pressure boiler houses as amended by the Decree No. 75/1996 Coll.
- Regulation of MPSVaR SR No. 147/2013 Coll., establishing details for ensuring safety and protection of health at construction works and related works, and details on professional competence for performance of certain work activities – the latest amendment MPSVaR SR Decree No. 100/2015 Coll.
- SÚBP Decree No. 208/1991 Coll. on safety at work and safety of technical equipment in operation, maintenance and repair of vehicles.
- MŽP SR Decree No. 453/2000 Coll. implementing certain provisions of the Construction Act.
- MŽP SR Decree No. 55/2001 Coll., on land use planning supporting documents and land use planning documentation.
- MPSVR SR Decree No. 508/2009 Coll. laying down the details for ensuring occupational health and safety for working with pressure, lifting, electric and gas technical equipment and determining

technical equipment considered as classified technical equipment - as amended by Decree of MPSVR SR No. 234/2014 Coll.

- MV SR Decree No. 533/2006 Coll. on details regarding protection of the public against effects of hazardous substances as amended by Decree of MV SR No. 160/2012 Coll.
- ÚJD SR Decree No. 48/2006 Coll. laying down the details on the method of notification of operational events and events during transportation and the details on investigating their causes as amended by ÚJD SR Decree No. 32/2012 Coll.
- ÚJD SR Decree No. 51/2006 Coll. laying down the details on the requirements for ensuring physical protection.
- ÚJD SR Decree No. 52/2006 Coll. on professional competence as amended by ÚJD SR Decree No. 34/2012 Coll.
- ÚJD SR Decree No. 54/2006 Coll. on registration and control of nuclear materials and on notification of selected activities.
- ÚJD SR Decree No. 55/2006 Coll. on the details in emergency planning for the case of incident or accident as amended by ÚJD SR Decree No. 9/2018 Coll.
- ÚJD SR Decree No. 57/2006 Coll. laying down the details on the requirements during transportation of radioactive materials – the latest amendment ÚJD SR Decree No. 105/2016 Coll.
- ÚJD SR Decree No. 58/2006 Coll. laying down the details of the scope, content and the method of preparation of documentation of nuclear installations necessary for individual decisions as amended by ÚJD SR Decree No. 102/2016 Coll.
- ÚJD SR Decree No. 430/2011 Coll. on requirements for nuclear safety – as amended by ÚJD SR Decree No. 103/2016 Coll.
- ÚJD SR Decree No. 431/2011 Coll. on quality management system – as amended by ÚJD SR Decree No. 104/2016 Coll.
- ÚJD SR Decree No. 30/2012 Coll. laying down the details on the requirements for nuclear materials, radioactive waste and spent nuclear fuel management – as amended by ÚJD SR Decree No. 101/2016 Coll.
- ÚJD SR Decree No. 33/2012 Coll. on the regular, comprehensive and systematic assessment of nuclear safety of nuclear installations as amended by ÚJD SR Decree No. 106/2016 Coll.
- ÚJD SR Decree No. 170/2015 Coll., establishing a list of radioactive materials, their quantities and their physical and chemical parameters justifying a low risk of nuclear damage.
- ÚJD SR Decree No. 76/2018 Coll., establishing special materials and equipment, which fall under the regulation by the Nuclear Regulatory Authority of the Slovak Republic.
- The Treaty establishing the European Atomic Energy Community (1957).

- Consolidated version of the Treaty establishing the European Atomic Energy Community (2016/C 203/01) O.J. EU C 203, 26 October 2012.
- Council Regulation (Euratom) No. 87/3954/Euratom of 22 December 1987 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feedingstuffs following a nuclear accident or any other case of radiological emergency as amended by Council Regulation No. 89/2218/Euratom of 18 July 1989.
- Commission Regulation (Euratom) No. 90/770 of 29 March 1990 laying down maximum permitted levels of radioactive contamination of foodstuffs and of feeding-stuffs following a nuclear accident or any other case of radiological emergency.
- Council Regulation (Euratom) No. 1493/93 of 8 June 1993 on shipments of radioactive substances between member states as amended.
- Council Regulation (Euratom) No. 2587/1999 of 2 December 1999 defining investment projects, which must be notified to the European Commission in compliance with the Article 41 of the Treaty establishing the European Atomic Energy Community.
- Commission Regulation (EC) No. 1209/2000 of 8 June 2000 determining procedures for effecting the communications prescribed under Article 41 of the Treaty establishing the European Atomic Energy Community as amended by the Commission Regulation (Euratom) No. 1352/2003 of 23 July 2003.
- Commission Regulation (Euratom) No. 302/2005 of 8 February 2005 on the application of Euratom safeguards.
- Council Regulation (EC) 428/2009 of 5 May 2009, setting up a Community regime for the control of exports, transfer, brokering and transit of dual use items – latest amendment - Delegated Commission Regulation (EU) 2016/1969 of 12 September 2016, amending Council Regulation (EC) 428/2009, setting up a Community regime for the control of exports, transfer, brokering and transit of dual use items.
- Commission Regulation (Euratom) No. 66/2006 of 16 January 2006 exempting the transfer of small quantities of ores, source materials and special fissile materials from the rules of the chapter on supplies.
- Directive 62/302/EC of 5 March 1962 on freedom to take skilled employment in nuclear energy.
- Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against dangers arising from ionizing radiation, repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom.
- Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent nuclear fuel.

- Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations with the effect for SR from 15 August 2017 as amended by Directive 2014/87/Euratom.
- Council Directive 2011/70/Euratom of 19 July 2011 establishing the Community framework for the responsible and safe management of spent fuel and radioactive waste.
- Directive of the European Parliament and the Council 2012/18/EU of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.
- Council Directive 2013/59/Euratom of 05 December 2013, laying down basic safety standards for the protection from the dangers arising from ionizing radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom.
- Council Directive 2014/87/Euratom of 8 July 2014, amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations.
- Commission Recommendation 2006/40/ES of 15 December 2005 on guidelines for the application of Regulation (Euratom) No. 302/2005 on application of Euratom safeguards.
- Commission Recommendation 2006/851/Euratom of 24 October 2006 on the management of funds for the decommissioning of nuclear installations and the management of spent fuel and radioactive waste.
- Commission Recommendation 2008/956/Euratom of 4 December 2008 on the criteria for exports of radioactive waste and spent nuclear fuel to third countries.
- Commission Recommendation 2009/120/Euratom of 11 February 2009 on implementation of accounting and record keeping and control of nuclear materials by the operators of nuclear installations.
- Commission Recommendation 2009/527/Euratom of 7 July 2009 for safe and effective system of sending documents and information in connection with the provisions of Council Directive 2006/117/Euratom.
- Council Decision 87/600/Euratom of 14 December 1987 on Community arrangements for the early exchange of information in the event of radiological emergency.
- Commission Decision 2008/312/Euratom of 5 March 2008 establishing a standard document on the supervision and control of shipments of radioactive waste and spent nuclear fuel, as provided for in the Council Directive 2006/117/Euratom.
- Council Decision 2013/434/EU of 15 July 2013 authorizing certain Member States to ratify, in the interest of the European Union, the Protocol amending the Vienna Convention on Civil Liability for Damage caused by the nuclear event of 21 May 1963 or to accede to it and make a declaration on the application of the relevant internal rules of the Union law.

Annex VI. List of ÚJD SR Safety Guides

BNS III.4.1/2000	Requirements for issuing authorization by ÚJD SR for use of fuel in WWER-440 reactors.
BNS III.4.3/2000	Requirements on assessment for fuel loading.
BNS I.8.1/2005	Specification on the scope of Preliminary plan of physical protection and Plan of physical protection in line with the Decree 186/1999 Coll. laying down the details concerning physical protection of nuclear installations, nuclear materials and radioactive waste.
BNS IV.1.3/2005	Requirements for design and operation of spent nuclear fuel storage facility.
BNS I.2.5/2005	Requirements of ÚJD SR on chap. 16 of the Pre-operational safety report “Limits and Conditions”.
BNS II.3.4/2006	Rules for the design, manufacturing and operation of monitoring systems to monitor degradation of safety important components of NI. Part 1. Corrosion Monitoring.
BNS I.4.2/2006	Requirements on elaboration of analysis and PSA studies.
BNS II.3.1/2007	Evaluation of acceptability of faults detected during in-service control of classified equipment of nuclear installations.
BNS III.4.4.2007	Requirements for realization and evaluation of test results of the physical start-up.
BNS II.1.1/2008	Registration and control of nuclear materials.
BNS I.7.4/2008	Complex periodic safety review.
BNS II.5.4/2009	Qualification of systems for non-destructive test in nuclear power engineering. Requirements and instructions.
BNS II.5.6/2009	Rules on design, manufacturing, assembly, repairs, replacements and reconstruction of mechanical and technological components of classified equipment of WWER 440 nuclear power plants.
BNS II.5.5/2009	Examining of mechanical properties, chemical composition a selected characteristics of resistance of material and welded joints against rupture under limit load conditions of mechanical and technological components of equipment of WWER 440 nuclear power plants.
BNS II.3.3/2011	Metallurgical products and spare parts for nuclear installations. Requirements.
BNS II.5.3/2011	Welding materials for welding mechanical-technology components of nuclear power plants. Technical requirements and selection rules.
BNS II.5.2/2012	Control of welding and quality of welds of components of classified equipment of nuclear power plants. Requirements.

BNS II.5.1/2012	Welding of nuclear equipment. Basic requirements and rules.
BNS II.2.1/2012	Requirements for securing protection against fire and fire safety of nuclear installations in terms of nuclear safety.
BNS I.12.1/2012	Requirements for quality assurance of software for safety analyses.
BNS I.6.2/2013	Requirements for reactor description and its design basis in the safety report.
BNS I.11.1/2013	Requirements for deterministic analyses of safety of NPPs with WWER-440/V213.
BNS I.1.2/2014	Scope and content of safety report.
BNS I.9.2/2014	Ageing management of NPPs – requirements.
BNS I.4.4/2014	Operation of a nuclear facility after reaching its design life. Requirements and instructions.
BNS I.4.1/2014	*Simple failure criterion.*
BNS I.12.3/2014	PSA quality for PSA applications.
BNS I.7.4/2016	*Comprehensive periodic safety assessment.*
BNS II.3.1/2016	*Evaluation of the permissibility of errors detected during operational inspections of selected equipment of nuclear installations.*
BNS II.9.2/2016	*Evaluation of mechanical characteristics of materials operated by selected mechanical engineering devices using SPT methodology.*
BNS II.9.1/2016	*Direct sampling of small samples from safety relevant components of Nis.*
BNS II.3.6/2016	*Rules for the design, manufacture and operation of systems monitoring degradation of safety relevant components of NI Part 3. Monitoring of radiation degradation processes of structural materials of NI.*
BNS II.3.5/2016	*Rules for the design, manufacture and operation of systems monitoring degradation of safety relevant components of NI Part 2. Monitoring of thermal aging processes of structural materials of NI.*
BNS II.3.4/2016	*Rules for the design, manufacture and operation of systems monitoring degradation of safety relevant components of NI Part 1. Corrosion monitoring.*
BNS I.9.4/2017	*Requirements for the recording of data relevant for the decommissioning of nuclear installation.*
BNS I.9.3/2017	*Requirements for the content and extent of the documentation for decommissioning, submitted as part of the application in the proceeding for approval pursuant to Section 5 par. 2 of the Atomic Act, and in the proceeding for granting authorization pursuant to Section 5 par. 3 a) to d) of the Atomic Act.*
Glossary	*Nuclear safety glossary of the Nuclear Regulatory Authority of the SR.*