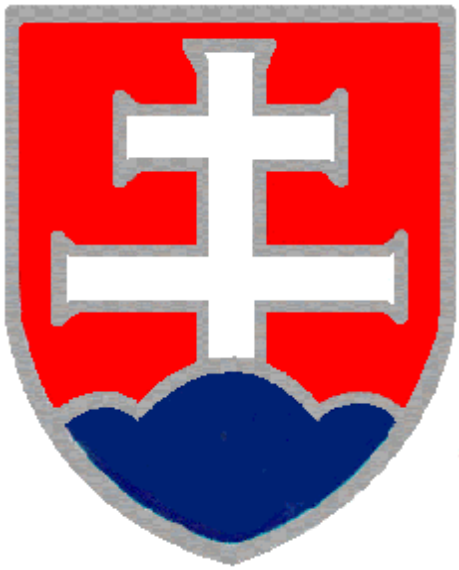
NATIONAL REPORT OF THE SLOVAK REPUBLIC



COMPILED IN TERMS OF
THE JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

2005

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Abbreviations

ACST	Automated control system of technology
ALARA	As low as reasonable achievable
BCC	Bohunice Conditioning Centre
CA	Controlled area
CDE	Collective dose equivalent
CE	Classified equipment
CG	Core grid
Coll.	Statute book
CoS	Coolant system
CP	Civilian protection
CRAM	Captured radioactive material
CS	Control system
ČSFR	Czech and Slovak Federative Republic
ČSKAE	Czechoslovak Atomic Energy Commission
ČSSR	Czechoslovak Socialist Republic
DEC	District Emergency Commission
DGR	Deep geological repository
DRW	Definition of responsibilities at work
E	Event
EC	Emergency Commission of the Slovak Government
ECC	Emergency Control Centre
ECC ÚJD	Emergency and Co-ordination Centre of the Slovak Nuclear Regulatory Authority
EdF	Electricité de France
EGP	Energoprojekt (The general designer of nuclear power plant V1 and V2)
EPO	Extended planned outage
ERO	Emergency response organization
ES	Elementary system
FA	Fuel assembly
FCT	Fuel rod Cladding leakage Test
FFS	Fresh fuel storage
FRC	Fibre-reinforced concrete container
FTT	Full train tests

Fund	State Fund of Nuclear Facility Decommissioning
HC	Hermetic container
HCDL	High-capacity decontamination line
HM	Heavy metal
HNMA	Head of Nuclear Material Accounting
HP	Handling procedure
HRAW	High level radioactive waste
IAEA	International Atomic Energy Agency
ICRP	International Commission for Radiation Protection
IDE	Individual dose equivalent
IFCI	Inspection of fuel cladding integrity
INES	International Nuclear Event Scale
INSAG	International Nuclear Safety Advisory Group
IRAW	Institutional radioactive waste
ISAR	Initial Safety Analysis Report
ISFS	Interim Spent fuel storage
L&C	Limits and conditions
MoEc	Ministry of Economy of the Slovak Republic
MoEn	Ministry of Environment of the Slovak Republic
MoH	Ministry of Health of the Slovak Republic
MoI	Ministry of Interior of the Slovak Republic
MoL	Ministry of Labour, Social Affairs and Family of the Slovak Republic
NF / NPF	Nuclear facility / Nuclear power facility
NFC	Nuclear fuel cycle
NCHI	State Faculty Health Institute
NLI	National Labour Inspectorate
NM	Nuclear material
NPP	Nuclear power plant
NPP A1	Nuclear Power Plant Bohunice A1
NPP Mochovce	Nuclear Power Plant Mochovce
NPP V1	Nuclear Power Plant V1 Jaslovské Bohunice (Unit 1&2)
NPP V2	Nuclear Power Plant V2 Jaslovské Bohunice (Unit 1&2)
NR	National report

NRR	National radwaste repository
NUF	Nuclear fuel
NUSS	Nuclear Safety Standards
OCP	Office of Civilian Protection at the Ministry of Internal Affairs of the Slovak Republic
OH&S	Safety and health protection at work
OMG	Operative-managing Group
OP	Operational manual
PHARE	EU initiative for the reconstruction of economy of central and east European countries
PO	Planned outage
PoSAR	Pre-operational Safety Analysis Report
PR	Planned repair
PRG	Program
PSA	Probabilistic safety assessment
PT	Preoperational tests
QA	Quality assurance
QA-NF	Code of fuel cycle in the quality assurance system
QAS	Quality Assurance Standard
QS	Quality system
R	Reactor
Ra	Radioactive
RAW	Radioactive waste
RB	Reactor building
RC	Reactor core
RE	Refurbishment
REC	Regional Emergency Commission
ReF	Refuelling
ReP	Refuelling pool
RH	Reactor hall
RM	Refuelling machine
RS	Radiation safety
RV	Reactor vessel
SAR	Safety Analysis Report
SE, a. s.	Slovenské elektrárne, joint-stock company

SE-EBO	Nuclear Power Plant Jaslovské Bohunice, subsidiary of SE, a. s.
SE-EMO	Nuclear Power Plant Mochovce, subsidiary of SE, a. s.
SE-VYZ	Decommissioning of the Nuclear Facilities, Radioactive Waste and Spent Fuel Management, subsidiary of SE, a. s.
SF	Spent fuel
SFP	Spent fuel pool
SHMI	Slovenský hydrometeorologický ústav (Slovak Hydro-Meteorological Institute)
SHRMN	Slovak Headquarters of Radiation Monitoring Network
SR	Slovak Republic
SRAW	Solid radioactive waste
STS	Slovak Technical Standard
TC	Transport container
TD	Technical documentation
TE	Transport equipment
TeI	Technical inspection
t_{HM}	Tons of heavy metal
TK C-30	Transport container for spent fuel - type C-30
TOP	Technological operating procedure
TP	Technological procedure
TS	Technical safety
TSSM	Technical specification of safety measure
TV	Television
ÚJD SR	Nuclear Regulatory Authority of the Slovak Republic
US	Universal shaft, shaft No. 1
US NRC	United States Nuclear Regulatory Commission
ÚVZ SR	Public Health Authority of the Slovak Republic
VÚJE	VÚJE Trnava, a. s. – engineering, design and research institute
WANO	World Association of Nuclear Operators
WW	Water work
WWER	Pressurised water reactor
ŽSR	Railway of the Slovak Republic

A. Introduction

The Slovak Republic ratified the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereafter “Joint Convention”) on 6-th October 1998. The National report was elaborated based on the Article No. 32 of the Joint Convention and its structure complies with the recommendations of the Guidelines regarding the Form and Structure of National Reports.

There are six nuclear units in operation in Slovakia at the present. All of them are equipped with reactors WWER-440. Four units are installed at Jaslovské Bohunice (EBO 1-4, called NPP V1 and NPP V2) and two of them at Mochovce (EMO 1-2).

Nuclear power plant A1 located at Jaslovské Bohunice was designed to use natural uranium as fuel in a heavy water reactor cooled with carbon dioxide (HWGCR – 150MW). This power plant was shut down in 1977 after an accident (INES 4) and it is in the first stage of decommissioning at present. The spent fuel from this plant was transported to the Russian Federation based on a valid contract.

The technology designed for radioactive waste management are located at Jaslovské Bohunice and Mochovce Sites. The technology for radioactive waste conditioning is part of the so-called Bohunice Conditioning Centre (BCC), which is in operation since 2001 and uses several technologies for waste treatment. There are also experimental radioactive waste treatment technologies installed at Jaslovské Bohunice.

The National Radwaste Repository of low and intermediate level waste (NRR) was commissioned near Mochovce in 1999 (trial operation).

An interim spent fuel storage is in operation at Jaslovské Bohunice since 1987. The seismic resistance and storage capacity of this facility was already enhanced.

More details on the technologies used for the spent fuel management and radioactive waste management can be found in the next chapters of this report.

SE, a. s. and VÚJE are the only operators of nuclear facilities in the Slovak Republic.

The state supervision of nuclear safety on spent fuel management and radioactive waste management is performed by the Nuclear Regulatory Authority of the Slovak Republic (ÚJD SR). The basic law for the peaceful use of nuclear energy is Act No. 130/1998 Coll., which was replaced with Act of the NC SR No. 541/2004 Coll. (so-called Atomic Act) effective as of 1 December 2004. ÚJD SR is an independent state authority headed by the chairperson with a significant delegated power according to the legislation. She has a direct access to the government. The state supervision on the radiation protection is assured by the Public Health Authority of the Slovak Republic (ÚVZ SR) in compliance with the Act No. 272/1994 Coll., as amended.

Work inspection (especially on the safety and health protection at work and safety of equipment) is performed by the National Labour Inspectorate (NLI) in compliance with the Act No. 95/2000 Coll. related to the inspection of work and in compliance with the Act No. 231/2002 Coll. The fulfilment of requirements on safety of technical equipment is verified by the Technical Inspection in compliance with the Act No. 330/1996 Coll. as amended.

The Slovak Republic joined all the significant international agreements and conventions in the field of peaceful use of nuclear energy.

A list of nuclear facilities according to the Join Convention is presented in Annexes L (a), (b), (c).

The 2003 National Report is available at ÚJD SR´s web site: www.ujd.gov.sk.

B. Spent fuel and radioactive waste management

B.1. Spent fuel management

The basic policy of spent fuel and radioactive waste management was established by the Resolutions No. 930/1992, No. 190/1994 and No. 5/2001 of the Slovak government.
In 1997 the Slovak government accepted the Updated Power Policy of SE, a. s. till year 2005. The related government Resolution No. 684/97 includes the provisions on the spent fuel management.

In 2000 the Slovak government adopted the Power Policy of the Slovak Republic that also relates to the concept of fuel cycle back-end.

The current basic concept of spent fuel management at SE, a. s. and in the Slovak Republic resulting from the documents above and updated by the SE, a. s. management can be characterized as follows:

1. The operation of nuclear reactors in Slovakia adopts an open fuel cycle. At the present time, it is impossible to apply a closed fuel cycle in Slovakia since the reactors WWER-440 are not licensed to utilise MOX fuel in Slovakia.
2. For the management of spent fuel a transport of spent fuel into foreign countries followed up by an import of reprocessed products (Pu, U, HRAW) into SR is not considered.
3. Short-term storage of spent fuel (3 to 7 years after its removal from the reactor core) is assured in the pools located at the reactors (SFP) installed at each reactor unit.
4. Long-term storage of spent fuel (40 to 50 years after its removal from the reactor) is secured by separate storage facility at Bohunice.
5. A long-term goal within the concept of spent fuel management is a construction of deep geological repository of SF and HRAW in the Slovak Republic.
6. To verify the possibility of transporting the spent fuel into foreign countries for final disposal or reprocessing without importing the products back into Slovakia.
7. In future, to verify the possibility of international or regional solution on the final spent fuel disposal and to follow the new technologies in the area of spent fuel management.

Long-term spent fuel storage (40 to 50 years after its removal from the reactor), which is required before conditioning and putting the spent fuel into a repository, will be carried out in separate spent fuel storage facilities at Jaslovské Bohunice and Mochovce. An interim spent fuel storage facility (ISFS - SE-VYZ) is in operation at Jaslovské Bohunice since 1987. ISFS - SE-VYZ was already reconstructed in order to increase its storage capacity. A project to enhance its seismic resistance and to improve its safety was accomplished in 1999. A project of spent fuel storage facility at Mochovce (ISFS - EMO) is currently in first stage of investment implementation.
All spent fuel assemblies from the A1 reactor unit (HWGCR reactor, in operation since 1973 till 1977) were transported to the Russian Federation till July 1999. Before 1987 a small number of spent fuel assemblies from WWER-440 reactors (697 fuel assemblies) were also transported to the Russian Federation.
There is a correspondence between SE, a. s. and several organizations in the Russian Federation (MINATOM, OAO TVEL) in order to verify the possibility of transporting the spent fuel for reprocessing into the Russian Federation without returning the resulted products back into the Slovak Republic. Proposal for such transportation was indicated by the Russian side already.
In 2001, the Slovak government in his Resolution No. 5/2001 accepted “The proposal on the schedule of economical and material solution on the management of spent fuel and decommissioning process of nuclear facilities” and assigned to submit a “Policy of decommissioning of nuclear facilities and management of spent fuel evaluated according to the act on environmental impact assessment” for a discussion on government level by 31. 12. 2007.

B.2. Radioactive waste management

The current policy of radioactive waste management in Slovakia was approved by the Resolution No. 190/94 of the Slovak government and after its update it can be characterized as follows:

1. Effectively use the current equipment for radioactive waste treatment and conditioning installed at Jaslovské Bohunice site.
2. Basic solidification methods of liquid radioactive waste, radioactive sludge and spent ion-exchanging resins into a form suitable for final disposal include cementation and bituminization.

3. The volume of solid radioactive waste will be minimised by applying compaction and incineration.
4. The treated radioactive waste is than grouted by active mixture of concrete and concentrate into fibre-reinforced concrete containers. These containers are suitable for transportation as well as for storage and disposal.
5. For treatment of intermediate level waste and radioactive waste with high contents of trans-uranium (specific liquid radioactive waste and sludge produced during the storage of spent fuel at Nuclear Power Plant A1 is necessary to apply a vitrification method.
6. Low-active soil and concrete debris shall be arranged into layers on supervised stockpiles.
7. The available methods (high-pressure compaction, cementation, etc.) shall be used for the treatment of metal radioactive waste. Because of the increasing trend of metal radioactive waste production a melting unit shall be installed and used for its conditioning. The low-activity metal waste shall be treated by applying fragmentation and decontamination and cleaned material can be than released into the environment.
8. Methods and technology of releasing of material (especially construction materials) into the environment shall be resolved.
9. Institutional radioactive waste shall be treated and conditioned into a form acceptable for disposal by applying standard methods for treatment of radioactive waste produced by nuclear facilities. The disused sealed sources shall be conditioned into a form suitable for centralised long-term storage or disposal.
10. Long-lived storage of radioactive waste is allowed only in specially adapted areas approved by the regulatory authorities. The radioactive waste, which is dedicated for long-term storage, shall be stored in solid form and in suitable containers.
11. The conditioned radioactive waste produced during the operation and decommissioning of nuclear power plants and the conditioned institutional radioactive waste that meet the acceptance criteria shall be disposed of in the National Repository in Mochovce.
12. The waste that is not acceptable for the National Repository in Mochovce shall be stored at the power plants. An integral storage shall be installed at Bohunice to allow storing of radioactive waste that is not acceptable for NRR.
13. The radioactive waste that does not meet the acceptance criteria for disposal in near surface repository shall be disposed of in a deep geological repository, such deep geological repository shall be built.
14. Transport of radioactive waste shall be carried out exclusively by using packaging and transporting equipment approved for this purpose.
15. The costs of radioactive waste management produced during the decommissioning of nuclear power facilities shall be covered from the resources of Fund. The costs of radioactive waste management produced during the operation of nuclear power plants shall be covered by the operational costs of these power plants.

B.3. Criteria used for the definition and classification of waste

Radioactive waste shall mean any material in gaseous, liquid or solid form for which no further use is foreseen, and that contains or is contaminated with radionuclides at concentrations or activities greater than clearance levels into the environment. The limiting concentrations for the individual radionuclides which allow releasing of these material into the environment are defined by the Regulation No. 12/2001 Coll. of MoH SR.

Classification of radioactive waste is based on the disposal principle and it is defined by the Regulation No. 190/2000 of ÚJD SR. This regulation distinguishes the following categories of radioactive waste:

a) **transitional radioactive waste**, activity of which decreases during the storage period below the limit value and then it is possible to release it into the environment,

b) **low-level radioactive waste and intermediate radioactive wastes**, activity of which is higher than the limit value for release into the environment and the produced residual heat is less than 2 kW/m^3 :

   1. **short-lived** radioactive waste, that after conditioning meets the acceptance criteria for near surface repository of radioactive waste and which average activity concentration of alpha nuclides is less than 400 Bq/g,

2. **long-lived** radioactive waste, that after conditioning does not meet the acceptance criteria for near surface repository or which average activity concentration of alpha nuclides is higher than or equal to 400 Bq/g,

c) **high-level radioactive waste**, that produces residual heat higher than or equal to 2 kW/m^3.

It has not been defined yet when the spent fuel becomes a high-level radioactive waste.

C. Scope of Application

C.1. Safety of spent fuel management

The scope of this report comprises the information on the safe management of spent fuel produced at nuclear facilities of SE, a. s. including the transportation and inventory of spent fuel.

The most significant facilities of SE a. s. from the spent fuel management point of view are as follows:

Nuclear Power Plant Bohunice, subsidiary of SE, a. s. (SE-EBO) - NPP V1 (Unit 1&2), NPP V2 (Unit 3&4)
Nuclear Power Plant Mochovce, subsidiary of SE, a. s. (SE-EMO, - Unit 1&2),
Decommissioning of the Nuclear Facilities, Radioactive Waste and Spent Fuel Management, subsidiary of SE, a. s. (SE-VYZ) - Interim Spent fuel storage (ISFS-VYZ).

At present there are neither facilities for the reprocessing of spent fuel nor equipment for management of high-level waste and other products of spent fuel reprocessing (plutonium, uranium) in the Slovak Republic. Reprocessing of spent fuel is not included into the concept of spent fuel management (see chapter B.1.). Currently, the spent fuel produced by nuclear power plants of SE, a. s. is not reprocessed in foreign countries with the intent to return the product back to the Slovak Republic. The spent fuel from Nuclear Power Plant A1 and portion of the spent fuel from WWER-440 reactors was in the past transported into the former Soviet Union without returning the high-active radioactive waste after reprocessing back into the Slovak Republic.

C.2. Safety of radioactive waste management

The scope of this report comprises the information on safe management of radioactive waste produced at the nuclear power facilities of SE, a. s. including the transport and radwaste inventory and information on management of radioactive waste produced by use of radiation sources. The waste that was not produced in frame of nuclear fuel cycle and that contains only natural radioactive nuclides is not covered by this report and it is not included into the presented inventory of radioactive wastes.

SE, a. s. is the operator of the most significant facilities from the radioactive waste management point of view:

Nuclear Power Plant Bohunice, subsidiary of SE, a. s. (SE-EBO) - NPP V1 (Unit 1&2), NPP V2 (Unit 3&4)
Nuclear Power Plant Mochovce, subsidiary of SE, a. s. (SE-EMO) - Unit 1&2,
Decommissioning of the Nuclear Facilities, Radioactive Waste and Spent Fuel Management, subsidiary of SE, a. s. (SE- VYZ) the following technologies:
NPP A1 (under decommissioning)
Technologies for the treatment and conditioning of radioactive waste,
National Radwaste Repository
VÚJE is the operator of an experimental incinerator equipped with an experimental cementation equipment and experimental bituminization plant.

D. Inventories and Lists

D.1. List and description of equipment for spent fuel management

D.1.1 Basic characteristics of SE-EBO and SE-EMO major facilities

Major facilities include:
- charging machine (CM),
- spent fuel pool (SFP),
- spent fuel pool reserve gride,
- spent fuel pool coverage,

- transport channel sealing plate,
- transport container pit,
- transport container stands,
- spent fuel laden transport container suspension,
- inspection shaft,
- sealed capsule for damaged fuel assemblies,
- platform over transport container shaft,
- service platform for spent fuel laden transport container in RH,
- sipping in core complete with a through-flow activity analyser MAK-8 serves to locate leaking fuel assemblies during shutdown. The equipment consists of seven-bell by means of which the whole core can be checked except for working part of emergency control road in 66 steps. The bell moves in the core using a working rod of the charging machine. The working part of emergency control roads is controlled in hermetic casing.
- the equipment for taking dropped objects from the core will be placed on the reactor-dividing plane. A dropped object in the core can be detected from the control panel using a TV system. It can be recovered and placed into a transport container through a head featuring interchangeable tools.
- platform for the spent fuel transport container in the reactor hall,
- overhead travelling electric crane 250/32/2 t.

For technical description of the facilities and details see the 2003 National Report.

D.1.2 Interim Spent fuel storage operated by SE-VYZ (ISFS-VYZ)

BASIC TECHNICAL DATA OF ISFS JASLOVSKÉ BOHUNICE	
Storage capacity by 31.12.2004	8,736 fuel assemblies
Number of pools	3 in operation + 1 standby
Ground-plan	45m x 70m
Total built-up area	95,000m^2
Capability of extension	2 to 3 pools
Storage method	In containers T 12, T 13, KZ 48
Maximum water temperature in pools	50 °C
Capacity of pool water purification system	25 m^3/hour
Method of spent fuel shipment	wagons, containers TC C-30
Size of pool, length x width x depth	23.4 x 8.4 x 7.2 m
Number of containers per pool	56 pcs type T-12, pert. 98 pcs type KZ-48
Design capacity of cooling system	2,533 kW

For technical description of the facilities and details see the 2003 National Report.

D.2. List and description of radioactive waste management facilities

D.2.1 Equipment of SE, a. s. for RAW management at NPP with WWER reactors

The following equipment is used for RAW management at NPPs:

Equipment for solid radioactive waste management includes collection equipment, sorting equipment, measuring equipment, washers, dryers, low pressure compactor and fragmentation equipment, packaging for storage of solid RAW.

SE-EMO is fitted with collection means, control means, sorting and measuring equipment, a washer and a dryer, a LP compactor, hydraulic shears for fragmentation of metallic wastes and a circular saw for fragmentation of soft PRAW.
Equipment for liquid radioactive waste management includes purification (filtrating) stations with ion exchange resins, evaporators, tanks and containers for storage of liquid RAW, contaminated oil cleaners, a storage facility for contaminated oil substances.

Equipment for gaseous radioactive waste management includes ventilation systems equipped with aerosol and iodine filters.

For more details see the National Report of 2003 is to be found on ÚJD SR´s web site: www.ujd.gov.sk.

D.2.2 Technologies for treatment and conditioning of radioactive waste at SE-VYZ

The following low - and intermediate level RAW treatment and conditioning technologies are currently installed at SE-VYZ, for which permanent operation licenses have been issued:

- Bituminization lines 44 a PS 100 - treatment of Ra-concentrates from the NPPs V1, V2 and of concentrates obtained by evaporation of contaminated water from decommissioning NPP A1 treatment plant (unit 41),
- Bohunice RAW Conditioning Centre (BCC RAO) - treatment and conditioning of concentrates from the NPPs V1 and V2 and of other low- and intermediate level liquid RAW, solid and compacted RAW from NPP operation and A1 decommissioning on the following facilities:
  - Incineration facility
  - Compaction facility
  - Concentration facility
  - Cementation facility into FRC containers.
- Sludge fixation facility (SFF)
- Vitrification line

D.2.3 IRAW management facilities

For description of the facilities see the 2003 National Report.

D.2.4 Equipment for radioactive waste shipment

To ensure the concept of RAW and IRAW (CRAM) management in the Slovak Republic a transport system was implemented providing for shipment of:

a) solid and liquid radioactive waste on site of Jaslovské Bohunice
b) solid radioactive waste between Jaslovské Bohunice and Mochovce
c) institutional radioactive waste and CRAM from the entire territory of Slovak Republic to Jaslovské Bohunice

Administration of radioactive waste shipment is assured to the full extent by SE-VYZ.

RAW shipment is carried out in approved shipment equipment by transport means complying with the requirements of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and of the Regulation concerning the International Carriage of Dangerous Goods by Rail (RID) and Act No. 541/2004 Coll. and related implementing regulations.

D.2.5 National Radwaste Repository

For description of the facility, see the 2003 National Report.
The National Radwaste Repository received permanent operation license in November 2001.
The repository area allows for extension to 10 disposal double-rows, i.e. for disposal of about 36,000 FRCs with RAW.

D.2.6 Bituminization line and incinerator VÚJE

VÚJE is developing documents necessary for decommissioning of these nuclear facilities pursuant to Act No. 541/2004 Coll.

D.3. List and description of facilities under decommissioning and equipment for decommissioning radioactive waste management

D.3.1 NPP A1 Bohunice – under decommissioning

For description of the installation see the 2003 National Report.

D.3.2 Equipment for management of decommissioning radioactive waste placed in NPP A1

Hall above the original solid RAW storage facility including solid RAW sorting facility in the premises No. 44/20
For description of the facility, see the 2003 National Report.
Wastes are currently taken out from shafts, sorted up and - stored in 200 dm^3 barrels. Combustible RAW are transferred to the BCC incinerator plant. The sorting facility is used for sorting RAW coming from A -1 operation compacted into packages. The purpose is to sort up already mentioned RAW into combustible and non-combustible.

RAW Fragmentation line
For description of the facility see the 2003 National Report.

Once fragmented, metallic RAW is decontaminated by blasting and upon monitoring on a certified monitoring equipment and after issuing of a certificate decontaminated RAW is released into the environment.

NPP A-1 high capacity decontamination line
For description of the facility see the 2003 National Report.
Verification facility (VICHR)
Verification is used for solidification of the radioactive chrompik into a glass matrix (description in 2003 National Report).

D.4. Inventory of spent fuel and RAW

The inventory of spent fuel and RAW is set out in Annexes III, IV and V.

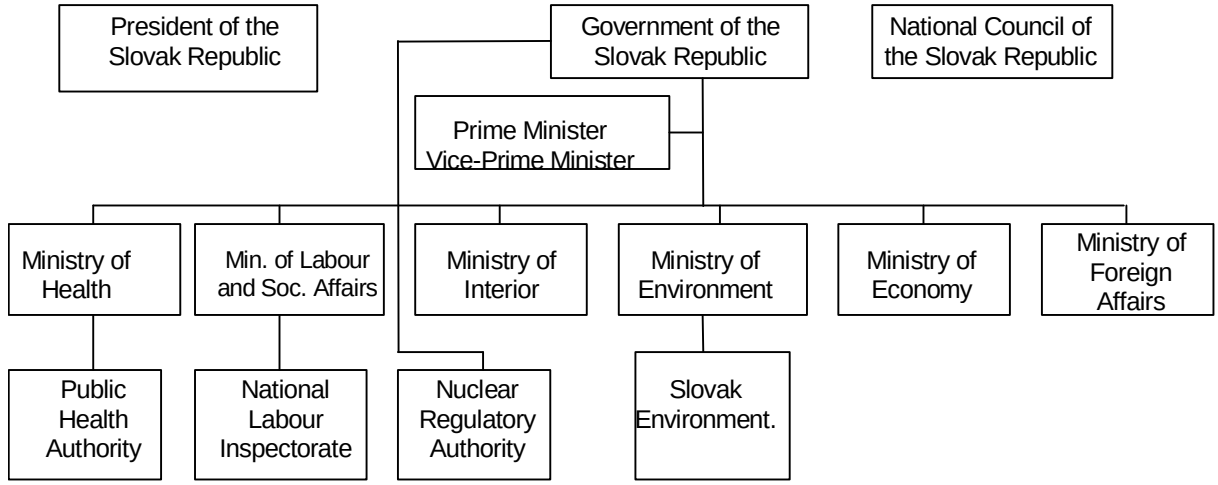
E. Legislation and Regulation

E.1. Legislative and Regulatory System

E.1.1 Structure of regulatory bodies

Supervision concerning the peaceful use of nuclear energy is performed by the governmental bodies and organisations within the framework of their competence defined by the respective acts (Annex V) according to the structure described bellow:

Structure of Regulatory Authorities



Nuclear Regulatory Authority of the Slovak Republic

ÚJD is a central state administration authority. It is taking care of the exercise of state regulatory activities in the field of nuclear safety of nuclear installations, including regulation of the management of radioactive waste, spent fuel and other parts of the fuel cycle, as well as of nuclear materials, including their control and accounting. It is responsible for the assessment of the goals of the nuclear energy program and of the quality of selected facilities and equipment of nuclear technology, as well as for commitments of the Slovak Republic under international agreements and treaties in the afore mentioned field.

Ministry of Health of the Slovak Republic

Ministry of Health is a central state administration authority for health care, health protection and other activities in the public health sector. State administration in the field of health protection is exercised by the Ministry of Health, the Public Health Authority of the SR and Regional Public Health Authorities. The scope of the Ministry's activities includes, a. o. establishing radiation limits and conditions for disposal and management of radioactive waste from the aspect of their potential health-related effects. The Public Health Authority carries out state supervision in radiation protection matters, issues and repeals licenses for activities leading to radiation exposure, licenses for activities of relevance to radiation protection and regulates expertly the health protection from ionising radiation effects.

Ministry of Environment of the Slovak Republic

Ministry of Environment is a central state administration authority for formation and protection of the environment. The following bodies report to the Ministry of Environment:

Slovak Environmental Inspectorate through which Ministry of Environment fulfils the role of the main state supervisor in environmental matters,

Slovak Institute of Hydrometeorology
Slovak Agency for Environment
Hydrology Research Institute and others

Ministry of Interior of the Slovak Republic (MoI)
Ministry of Interior is a central state administration authority responsible *inter alia* for the conceptual management and control of fire protection, integrated rescue system (Act No. 129/2002 Coll. on Integrated Rescue System), including the civil protection of population and property, public order and safety of persons. The Ministry is also responsible for the organization of aid to population (Act No. 42/1994 Coll. on Civil Protection as amended by later regulations) in case of nuclear and radiation accident.

Ministry of Economy of the Slovak Republic (MoEc)
Ministry of Economy of the Slovak Republic is a central state administration authority responsible for (*inter alia*) nuclear energy, including the nuclear fuel management and radioactive waste management, authorisation of import and export of special material and equipment.

Ministry of Labour, Social Affairs and Family of the Slovak Republic (MoL)
Ministry of Labour, Social Affairs and Family of the Slovak Republic is a central state administration authority responsible *inter alia* for the safety and health at work and labour inspection. State administration in the area of inspection is executed by the MoL, National Labour Inspectorate and Labour Inspectorates.

National Labour Inspectorate reports to the MoL and executes *inter alia* the labour inspection in the field of nuclear energy and performs supervision pursuant to separate regulations. Labour Inspection consists mainly of supervision relating to the compliance with legal norms and other regulations concerning the safety and health at work and safety of technical equipment. Afore mentioned supervision is executed pursuant to regulations mentioned in part F.5.3.

Technical Inspection reports to the MoL and verifies the compliance with the requirements relating to safety of technical equipment.

E.1.2 Legislation

E.1.2.1 Introduction

The Legal system is structured as follows:

1. Constitution is the supreme basic law of state and is adopted by the Parliament – Constitution is generally binding.
2. Constitutional acts.
3. Laws defining basic rights and obligations specifying the principles in various areas; they are adopted by the Parliament and are generally binding.
4. Approximation ordinances issued by the Government - are generally binding in nature.
5. Governmental ordinances are subordinated to laws and are adopted by the Government – they are generally binding.
6. Central state administration authorities (e.g. ministries) issue (regulations) Regulations and orders and measures to define details of laws' and governmental ordinances' implementation – they are generally binding.
7. Guides (handbooks) contain detailed requirements and recommended steps to secure compliance with the requirements. They are issued by the regulatory authorities (not mandatory).
8. Internal standards (such as e.g. directives and instructions) represent the internal organizational rules issued by the respective regulatory authority; they are considered the base of the internal quality assurance system.

E.1.2.2 Legal regulations in the field of state regulatory activities

Act No. 541/2004 Coll. on peaceful use of nuclear energy (Atomic Act) and on alteration and amendment to certain laws - lays down conditions for safe use of nuclear energy exclusively for

peaceful purposes in accordance with international agreements made by the Slovak Republic. The Act also contains clauses laying down financial compensations in the case of a nuclear accident, envisaging €75,000,000 as a limit for the operator´s financial liability for a nuclear installation for energy purposes and €50,000,000 for other nuclear installations and radioactive material shipments. Under the Atomic Act, a nuclear installation means a set of civil structures and technological equipment a part of which is a nuclear reactor(s), facilities and structures for production or processing of nuclear materials or storage of nuclear materials in quantities exceeding one effective kilogram, for processing, treatmentand storage of radioactive waste, for disposal of radioactive waste from nuclear installations, institutional radioactive waste or spent fuel; neither containers and shields where nuclear material is used as a shielding material for radioactive emitters nor areas where such containers and shields are stored shall be deemed nuclear installations.

The Act came into force since 1 December 2004, except for Arts. 3 (9) and (10) that are coming into force since 1 January 2007 (establishment of a RAW disposal institution) and replaced until then effective Act No. 130/1998 Coll. on peaceful use of nuclear energy. All the regulations issued to date were repealed by the Act and new ones are currently under preparation (Annex V). ÚJD SR issues safety guidelines (Annex V) as well.

E.1.2.3 Radiation protection related requirements and regulations (see E.2.)

E.2. Regulatory authorities

E.2.1 Nuclear safety supervision

The central legal document is **Act No. 541/2004 Coll.**, under which 13 new draft decrees are prepared and ÚJD SR decisions issued.
ÚJD SR issues a variety of types of decisions, licenses, permissions, authorizations: following types of decisions.

A permission for siting of a nuclear installation will be issued by ÚJD following written application supported with appropriate safety documentation under Art. 17 of the Atomic Act and under Annex 1 (A) thereof.

An authorization for construction of a nuclear installation (building authorization) will be issued by ÚJD following written application from the building owner supported with appropriate safety documentation (see H.4) under Art. 18 of the Atomic Act and under Annex 1 (B) thereof.

An authorization for commissioning and operation of a nuclear installation will be issued by ÚJD following application from the operator supported with appropriate safety documentation (see H.6) and a report on the assessment of the previous phase of commissioning under Art. 19 of the Atomic Act and under Annex 1 (C) thereof. Without ÚJD´s particular authorization, operation of nuclear installations including spent fuel and RAW management facilities is prohibited.

Radioactive waste management
Radioactive wasteor spent fuel can only be managed under a ÚJD authorization.

The building owner or operator shall be obliged to submit **modifications during the construction, operation and decommissioning** of a nuclear installation affecting nuclear safety to ÚJD for consideration and approval or permission.

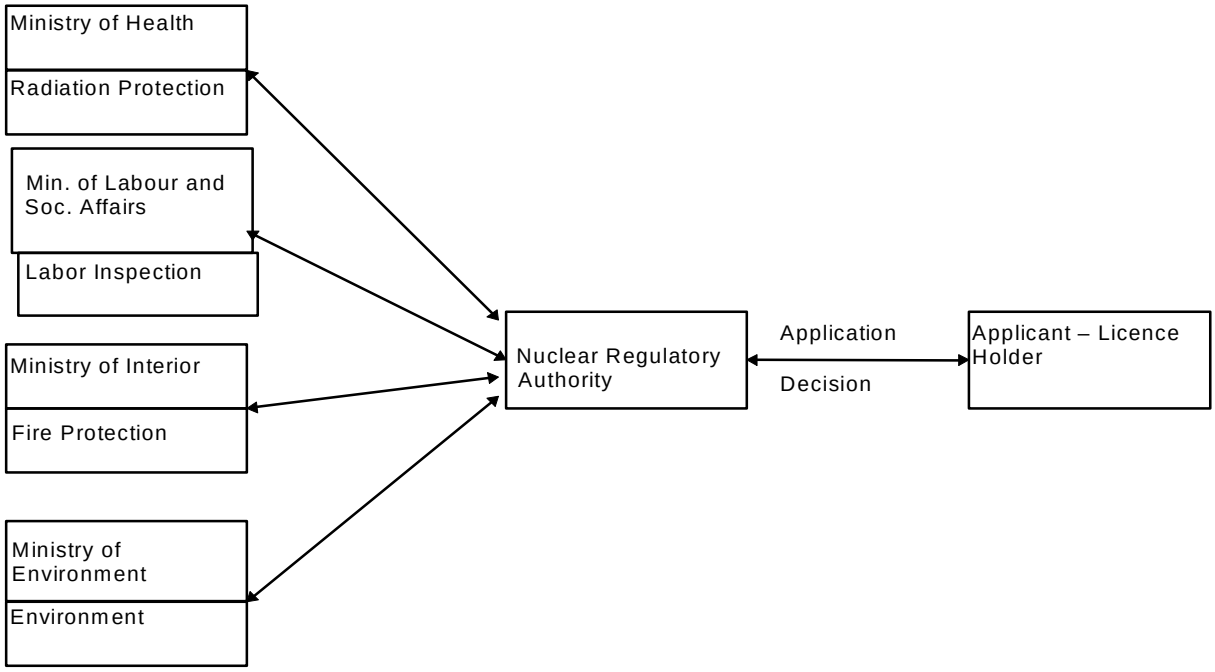
Quality assurance
Quality systems and requirements for the quality of nuclear installations and activities are subject to ÚJD approval and control.

International Atomic Energy Agency standards and recommendations apply in the nuclear installation licensing process.

The licensing proceedings have the following main stages: siting, construction, commissioning, operation, decommissioning. Prior to the issue of a license for operation the regulatory authority carries out controls according to approved programs for non-active and active tests.and trial

operation. Major regulatory authorities and the licensing procedure process are illustrated in the figure below.

Fig. E.2.1 Licensing procedure for the construction, operation and decommissioning stages (siting is governed by another process)



The principal conditions for the granting of the authorization from the aspect of nuclear safety include drafting and submission of safety report and other prescribed safety-related documents, and meeting the conditions of the previous legal proceedings and authority's decisions.

ÚJD grants the approval for the siting for the Regional Building Authority. ÚJD is a building authority for the building authorization and official construction approval. As regards necessary licenses and approvals from other state authorities, the obligations of those authorities are fixed by Act No. 50/1976 Coll. (Building Act), the Atomic Act, Slovak Ministry of Environment Regulations Nos. 453/2000 Coll., 5/2001 Coll. and Slovak Labour Safety Office Regulation No. 66/1989 Coll., as amended by Regulation No. 31/1991 Coll. and Slovak Ministry of Labour, Social Affairs and Family Regulation No. 718/2002 Coll., and a number of others.

License holder bears liability for the safety of nuclear facility.

E.2.1.1 Role of regulatory authority

Pursuant to Act No. 575/2001 Coll., ÚJD provides for the exercise of the tasks of the state regulatory body for nuclear safety of nuclear installations, including supervision of the management of radioactive waste, spent fuel and other parts of the fuel cycle, as well as of nuclear material, including their control and accounting. It takes care of the assessment of the goals of the nuclear energy utilization program and of the quality of classified equipment and nuclear technology devices, as well as of the commitments of the Slovak Republic under international agreements and treaties concerning nuclear safety of nuclear installations and management of nuclear materials. Pursuant to Act No. 541/2004 Coll., ÚJD is the state regulator in the field of nuclear safety of nuclear installations; in particular:

performs inspections of workplaces, places of operation and premises of nuclear facilities, checking on the compliance with the responsibilities under the Atomic Act, regulations issued based thereon, operating regulations, adherence to limits and conditions of safe operation, quality assurance systems as well as the responsibilities arising from measures and instructions issued pursuant to the Atomic Act (see chapter E.2.2.3),
verifies the compliance with the commitments under international agreements and treaties, in nuclear safety, management of nuclear materials, radioactive waste from nuclear facilities and treatment for disposal and disposal of institutional radioactive wastes, management of spent nuclear fuel, including accounting and control,
identifies the status,reasons and consequences of accidents, incidents and selected failures, and takes part, being a mandatory body, in the investigations of incidents and accidents led by other authorities,
checks the performance of mandatory inspections, reviews, operating controls and tests of selected equipment in nuclear facilities,
orders the elimination of shortcomings impacting upon nuclear safety,
reviews nuclear safety of nuclear facilities independently of the operator,
checks the contents and exercise of emergency plans.

UJD issues annual reports on the status of nuclear safety of nuclear installations on the territory of the Slovak Republic and on its activities for the preceding year and submits this report to the Government of the Slovak Republic and subsequently to the National Council of the Slovak Republic, once a year, always by 30 April.

E.2.1.2 Regulatory methods to verify operator's compliance with licence conditions - inspections

The tasks in the field of state regulatory activities are fulfilled by ÚJD´s nuclear safety inspectors. In fulfilling their tasks in the field of state supervision, the nuclear safety inspectors follow ÚJD´s directive Inspection Activities. The Directive sets a uniform procedure for inspections, for the processing and evaluation of annual inspection plans, management of ÚJD´s inspection program, processing of documentation of inspection activities, and for analysis of ÚJD´s inspection activities.

The inspection plan is a tool for continuous and systemic evaluation of inspection activities at nuclear installations, as well as during transport and controls of nuclear material. As a rule, such plan is developed for the period of one year.

The plan comprises the following sections: (1) Operation and decommissioning of nuclear installations including radioactive waste management (NI), (2) Care of NI equipment, (3) Technical support to NI, (4) VÚJE NI, (5) Transport of nuclear material, (6) Control of nuclear material and accounting(7) Control of other licence holders.

Inspections follow inspection procedures that are part of the ÚJD´s Inspection Manual. Individual inspection procedures are developed for inspection activities for which no inspection procedures have been developed.

Types of inspections

In general, planned and non-planned inspections are distinguished; this represents the first level of classification. The second level recognizes routine, special and team inspections for both planned and non-planned ones.

Planned inspections:

Routine inspections are intended to verify the provisions for the compliance with requirements and conditions of nuclear safety, condition of the NI, compliance with approved limits and conditions and with selected operating regulations. Routine inspections are performed mainly by resident inspectors at the corresponding NI. In case of inspections that by their scope go beyond the professional competence of the resident inspectors, inspections will be performed by nuclear safety inspectors from different Divisions of ÚJD. Routine inspections follow the procedures included in the Inspection Manual.

Special inspections are performed by nuclear safety inspectors in accordance with the basic inspection plan. Special inspections focus on specific areas, in particular on the verification of the compliance with requirements and conditions of regulations pursuant to § 31 of Act No. 541/2004 Coll.

Special inspections as a rule follow procedures contained in Inspection Manual.

Team inspections focus on the compliance with requirements and conditions set by ÚJD pursuant to § 31 of Act No. 541/2004 Coll., as a rule within several safety areas in parallel. Team inspections are planned for areas selected based on long-term assessment of operator's results based on inspection activities and analyses. Team inspections mean inspections on which several departments participate.

Non-planned inspections:

Non-planned inspections are performed by nuclear safety inspectors as routine, special or team inspections. Such inspections are triggered by conditions prevailing at the NI (e.g. start-up stages) or by events at the NI. ÚJD uses them to respond to situations that have occurred at the NI.

Rules applicable to any type of inspections.

Principally, inspections are announced in advance to the entity subject of supervision. However, they do not need be notified in advance if their focus and nature requires to do so.

Inspections of NI are notified in advance to the corresponding resident inspector. As a rule, resident inspectors participate in the inspections.

Any inspection performed by more than a single inspector has a head of inspection team appointed.

Inspection protocol:

Any inspection performed must be documented in the form of a protocol or record. Binding instructions concerning the measures to be taken to eliminate shortcomings identified are recorded in the protocol. They have to be formulated clearly so as to impose the responsibility to eliminate shortcomings identified and to set clear and unambiguous deadlines for afore mentioned measures fulfilment.

Analysis of inspection activities

Analysis of inspection activities comprises statistical evaluation of the findings. The objective of the statistical evaluation is to determine the distribution and the frequencies of inspection findings. Based on the evaluation of the developmental trends of inspection findings inspection plans for the period to come can be modified, to focus in particular on those areas where most shortcomings have been identified with respect to the entity subject to supervision.

Fine

Pursuant to the permission for the operation and radioactive waste management, the requirements and conditions of nuclear safety approved and introduced by the regulatory authority are monitored. In case of violation of fulfilment of nuclear safety requirements, the regulatory authority is authorized to impose penalty on the licence holder, as well as on its employees. In case of violation of fulfilment of requirements or legal provisions, the regulator is authorized to impose on the licence holder a sanction including the financial penalty.

E.2.2 State regulation relating to health protection against radiation

E.2.2.1 Authorization procedure

Approval of the activities resulting in radiation exposure is subject to provisions of Act No. 71/1967 Coll. on Administrative Proceeding. Act No. 272/1994 Coll. on Protection of Public Health as amended by later regulations defines in detail the conditions for granting authorisation, in particular:

the requirements on applicant for authorisation,
the requirements on expert representative for the radiation protection,
the requirements on contents of application for authorisation,
the list of documents to be approved and other documents.
The Act further defines the requirements for authorisation and conditions under which authorisation may be changed, revoked or under which it loses its validity.
The mandatory documentation to be attached to the application for authorization allowing the activities resulting in radiation exposure could be classified as documentation subject to approval and other documentation. Documentation subject to approval includes:
the radiation protection quality assurance,
the radiation protection program,
the proposal for restricted area definition,
the workplace monitoring plan,
the emergency plan.
Other documentation includes a list of background documents and documents used by the applicant to provide the evidence of compliance with the requirements concerning radiation protection and safe operation of nuclear facility.

E.2.2.2 Regulatory authority for radiation protection

Regulation of health protection against radiation in the Slovak Republic is provided by the Public Health Authority of SR (ÚVZ SR) pursuant to provisions defined by Act No. 272/1994 Coll. on Public Health Protection, as amended.. Authorities of the state health regulation for protection against radiation include ÚVZ SR and Regional Public Health Authorities. With respect to health regulation in nuclear facilities, the responsible body is ÚVZ SR.

E.2.2.3 Regulatory authority competence

Regulation of nuclear safety when defining safety requirements on technological equipment and operation of nuclear facilities is to the end-effect based on the requirements related to health protection and vice versa. Accordingly, the co-operation of ÚJD SR and the Slovak Ministry of Health is of importance, as well as their complementary functioning. Last barrier that shall provide for the nuclear facility safety and prevent of release of ionizing radiation or radioactive substances into the workplace or environment is considered a borderline dividing the regulatory competence over the nuclear safety and radiation protection.
ÚJD SR and the Ministry of Health of the Slovak Republic entered into the agreement on co-ordination of regulatory activities and providing for their common complementary regulation.
In terms of the provisions of the above mentioned Act, the Chief Hygienist, with respect to nuclear facilities:
- grants authorisations for:
  - the commissioning of nuclear reactors – physical commissioning,
  - the t operation of nuclear reactor,
  - the performance of maintenance and repairs on nuclear reactors,
  - the constructional and technological modifications,
  - the shipment of radioactive sources,
  - the cancellation of workplaces with nuclear reactor (final removal of radiation sources and of radioactive contamination),
  - the discharge of radioactive substances into the environment, while setting limits for radioactive emissions and liquid discharges,
- approves selected documentation and restricted areas,
- issues statements on:
  - the construction and constructional and technological modificationss during construction relevant from the aspect of radiation protection,
  - the individual steps of commissioning,
  - the individual stages of decommissioning and on structural and technological modifications during decommissioning relevant from the aspect of radiation protection,
  - the territorial planning documentation in connection with the siting of the nuclear reactor,
  - the proposal of hygienic protection zones definition,
- issues instructions for elimination of identified shortcomings,
- establishes commissions to review the professional qualification for performing activities resulting in radiation exposure,

- imposes sanctions.

Moreover, the Chief Hygienist grants authorisation for the activities relevant from the aspect of radiation protection:

- for personal dosimetry,
- for monitoring of working conditions and environment,
- for the performance of professional training concerning the performance of activities.

Authorisation issued by the Chief Hygienist for performing ofthe activities resulting in radiation exposure and concerning nuclear facilities is not considered the final licence; they nevertheless represent the precondition for licence to be granted by the state administration authority.

E.2.2.4 Supervision method to verify fulfilment of licence conditions

Regulation of radiation protection in the nuclear facilities is performed by Nuclear Installations Department of Division for Health Protection Against Radiation exposure at the ÚVZ SR. This Department is responsible for inspection of radiation protection of nuclear facility's employees and also for the inspection of radiation protection of population in the vicinity of nuclear facility. The above-mentioned Act defines the responsibilities of licence holders to provide information and enable the exercise of state regulatory activities and defines also the authorisations of persons exercising the regulatory activities.

Approval of the activities resulting in radiation exposure is subject to provisions of Act No. 71/1967 Coll. on Administrative Proceeding. Act No. 272/1994 Coll. on Protection of Public Health as amended by later regulations defines in detail the conditions for granting permits.

The Act further defines the requirements for permit and conditions under which permit may be changed, revoked or under which it loses its validity.

The mandatory documentation to be attached to the application for permit authorizing the activities resulting in radiation exposure could be classified as documentation subject to approval and other documentation. Documentation subject to approval includes:

the radiation protection quality assurance,

the radiation protection program,

the proposal for restricted area definition,

the workplace monitoring plan,

the emergency plan.

Other documentation includes a list of background documents and documents used by the applicant to provide the evidence of compliance with the requirements concerning radiation protection and safe operation of nuclear facility.

Persons exercising the state regulatory activities in the area of health are in terms of provisions defined by the respective legal norms authorized to enter the enterprises and premises, request information, take samples, investigate and inspect the corresponding documents. When exercising their activities, they verify the compliance with the generally binding legal act and regulations, conditions set in permits, measures and instructions issued by the regulatory authority for health protection.

Inspection of radiation protection is provided by:

the system of information that operator continuously provides to the institution exercising the regulatory activity under the conditions defined by the permit to perform activities resulting in radiation exposure,

the on-site inspections.

According to the purpose of inspections they usually include monitoring of radiation situation in the working environment, in the vicinity of nuclear facilities and in the reference localities, using their own means. The objective of measurement is to evaluate the objectification of the nuclear facility operation impact on the working conditions and environment.

When exercising the state regulatory activity with respect to radiation protection, persons exercising the activities inspect mainly:

the radiation situation in the nuclear facility, while performing their own measurements,

the compliance with approved documentation,

the dose-related burden on employees, records of dose exposure of nuclear facility's employees, with their own analyses of burden on employees,

the monitoring of discharges, with random inspection measurements of some parameters of the radioactivity discharges,

the application of optimisation of radiation protection,

the expert and health-related capacity of employees, managers and expert representatives for radiation protection,
the documentation relevant for the health protection against radiation,
the conditions for discharge of radioactive substances into the environment,
the preparedness of nuclear facilities for radiation incidents and emergency situations,
the impact of nuclear facilities operation on the radioactivity of environmental items and exposure of population to doses, with performing their own analyses concerning the radioactivity of environmental items,
the activities of radiation inspection laboratories in the vicinity, etc.
Employees exercising the regulatory activity prepare on the basis of findings, background documents for decisions of the health protection authority when executing the approval activities resulting in radiation exposure and in imposing measures, instructions or sanctions.
Nuclear Installations Department performs mainly the monitoring of dose rates, activities of airborne particles, surface contamination or other special measurements in the working environment. In the nuclear facility's vicinity, the monitoring of integral doses using TLD method and discontinuous measurements of dose rates is used in the monitoring point system, as well as monitoring of the activities of corrosion and fission products in fallouts, airborne particles, drinking, surface and ground waters, soil, sediments, agricultural products and food components produced in the vicinity of nuclear facility. At irregular intervals, parallel analyses of airborne particles in exhalations and samples of wastewaters are performed by the Department.

E.2.3 National Labour Inspectorate (NLI)

According to the Act No. 93/2000 Coll. On Labour Inspections as ammendedlabour inspection in the nuclear energy sector is carried out in order to supervise the compliance with the legal and other provisions relating to the protection of safety and health at work and to the provision of technical equipment safety including regulations governing the working places factors.

E.2.3.1 Role of the regulatory authority

With respect to the labour inspection the National Labour Inspectorate:
issues permits to the legal entities granting them the right to issue certificates on the safety of technical devices and withdrawns these licences,
proposes what technical equipment shall be considered the reserved technical equipment,
proposes the conditions and method of evidence and registration of injuries at work, operational accidents (incidents) and failures of technical equipment including the direct investigation of these events,
applies the labour protection requirements on granting of building permit and commissioning decision,
decides on imposing the penalty provided that the execution of labour inspection in the nuclear energy sector is concerned,
issues permits and certificates to legal entities and persons authorizing to execute the activities on nuclear facilities and examines the compliance with the scope of permits and certificates and with other conditions of their issuance, and disqualifies these permits and certificates from legal entities and persons.

E.2.3.2 Methods of supervision

Labour inspections in the nuclear power industry can be divided into two parts.
Part 1 consists of the State Supervision focused particularly on control of reserved technical equipment.
Control activity is carried out under:
- Slovak Labour Safety Office Regulation No. 66/1989 Coll. on safety of reserved technical equipment in the nuclear power industry, as amended by Slovak Labour Safety Office Regulation No. 31/1991 Coll.
- Slovak Ministry of Labour, Social Affairs and Family Regulation No. 718/2002 Coll. on occupational health and safety and safety of technical items

Labour inspection consists of (Slovak Labour Safety Office Regulation No. 66/1989 Coll., as amended by Slovak Labour Safety Office Regulation No. 31/1991 Coll.):
1. Control and issue of statements on materials and activities.
2. Verification of professional competence of legal entities and issue of:
   - license for legal persons to carry out production, installation, repair, reconstruction, maintenance,

testing, construction work including certification of accompanying technical documentation,
- certificates for natural persons to carry out tests and certify accompanying technical documentation of items.

3. Control participation in tests:
   - construction, individual and pressure tests,
   - integral tightness tests,
   - repeated pressure and tightness tests.
4. Control and certification of accompanying technical documentation of items.

Furthermore, labour inspection consists pursuant to Slovak Ministry of Labour, Social Affairs and Family Regulation No. 718/2002 Coll. in particular of:

1. Control of:
   - accompanying technical documentation of ventilation equipment,
   - conduct of prescribed special inspections and special tests, etc.
2. Verification of professional competence (control) and issue of licenses and certificates to legal persons and natural persons for particular activities.
3. Control of ventilation equipment documentation.

Part 2 consists of the State Supervision focused on control for compliance with other regulations on occupational health and safety and safety of technical equipment.
Labour inspection consists particularly of control for compliance with the relevant acts and decrees.

Technical inspection (TI)
TI activity in the nuclear power industry is executed in accordance with Act No. 330/1996 Coll., as amended, comprising the check-up for compliance with the requirements for safety of classified technical items and technical items.

Technical inspection:

a) delivers expert and binding opinions on whether the requirements for safety of technical items are complied with in the design, construction, manufacture, installation, operation, service, repair, maintenance, special inspections and special tests of classified technical items,
b) carries out inspections, manages and evaluates tests of classified technical items,
c) verifies professional competence of legal entities for the manufacture, installation, repair, maintenance, special inspections and special tests of classified technical items,
d) verifies professional competence of natural persons for tests, special inspections and special tests, repair and service of classified technical items,
e) certifies whether technical items, material and documentation of structures, technical items, technologies, machinery and equipment prototypes comply with the requirements for safety of technical items.

F. Other General Safety Provisions

F.1 Responsibility of the licence holder

F.1.1 Principles and definition of nuclear and radiation safety

Nuclear safety is according to the Act No. 541/2004 Coll. the status and the ability of nuclear installation or transport equipment and operating personnel thereof to prevent uncontrolled development of fission chain reaction or unauthorised release of radioactive substances or ionising radiation into the working environment or the environment, and to mitigate consequences of incidents and accidents at nuclear installations or consequences of events upon shipment of radioactive material.

The responsibility for nuclear safety shall be with the authorisation holder. The authorisation holder shall be liable to provide for adequate funds and human resources to ensure nuclear safety, including the necessary engineering and technical support activities in all areas related to nuclear safety. The authorisation holder shall pay attention to the safety issues prior over any other aspects of the

authorised activity.

During the operation and during the decommissioning of a nuclear installation, the authorisation holder shall be liable to perform regular, comprehensive and systemic assessments of nuclear safety (hereinafter referred to as “periodic safety assessment”) taking into account the state of the art in the area of nuclear safety assessment, and to take measures to eliminate any deficiencies identified.

A level of nuclear safety, reliability and health protection at work and safety of technological facilities, protection of health from ionising radiation, physical 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 can be reasonably achieved according to the available state-of-the-art knowledge; at the same time, radiation exposure limits must not be exceeded. Upon new significant information being obtained about the risks and consequences of the use of nuclear energy, the above mentioned level must be reassessed, and measures shall be taken as necessary to meet the conditions pursuant to Atomic Act.

The primary principles in radioactive waste management are:
a) maintain subcriticality,
b) ensure that residual heat is removed,
c) minimise the ionising radiation effects on operating personnel, the public and the environment,
d) have regard for properties affecting nuclear safety such as toxicity, flammability, explosiveness and other dangerous properties.

IAEA recommendations are incorporated into internal documentation of regulatory body and operator. The operator’s highest level are strategies for individual areas, including nuclear and radiation safety strategies, where priority of nuclear safety is declared. In the operating documentation of the quality system for nuclear safety, radiation safety and emergency planning are applied IAEA safety standards and safety principles (INSAG 3, INSAG 4, INSAG 10, INSAG 12, INSAG 13 and INSAG 15.) Safety standards and guides of IAEA create base for elaboration of working documentation of the quality system, as well as operating documentation of the operator.
Technical equipment safety is technical safety, which is characterized by physical state of individual equipment, which ensures its strength, tightness, reliability and functionality in the scope of designed operational states for their whole lifetime. Record keeping and technical-organizational measures directed to the reliability of operation without jeopardy for people or property is very important part of technical safety.

F.1.2 Nuclear safety and radiation protection policy

The first “Concept for nuclear safety and radiation protection“ was approved by SE, a. s., Board of Directors in November 1997.
In June 2004, SE, a. s., Board of Directors approved “Slovenské elektrárne, a.s., Safety policy“. Its purpose is to set safety goals, requirements, principles, responsibilities, measures and methods of their implementation for all areas of safety - nuclear safety, radiation protection, environmental safety, physical protection, etc. Following up on Safety policy will be policies in the respective areas, hence also “Nuclear safety and radiation protection policy“ to be issued in June 2005 and replace the hitherto concept of 1997. In both policies the Board of Directors has subscribed repeatedly to the basic responsibility for nuclear safety, setting out the priority of nuclear safety and its precedence over the other interests of the company.
The policy is binding on all employees of plants operating nuclear installations and thereby also on HQ staff whose job description concerns directly or is related to the operation of nuclear installations, nuclear safety and radiation protection.
The safety goals and safety policy principles and requirements are elaborated in safety plans, basic guidelines, related management and working documents.
The policy sets nine primary safety goals laying down the basic direction of nuclear safety and radiation protection activities. Moreover, their abridged summary is set out:
1. Improve permanently nuclear safety and radiation protection standards.
2. Do not exceed the limits for individual exposure and those for activity of radioactive atmospheric and hydrospheric discharges.
3. Apply the ALARA principle to control of individual exposures, control of activity of environment

radioactive discharges and control of production of radioactive wastes, thereby constantly reducing the radiation load in the surrounding area of nuclear installations.

4. Keep as low as possible environmental impacts from company activities in the process of construction, commissioning, operation, decommissioning of nuclear installations and in possible emergencies.
5. Take action preferably to prevent abnormal operating states, nuclear accidents and breakdowns from occurring. For the case of the occurrence of nuclear accidents and breakdowns, take action to detect and handle them.
6. Keep as low as possible the probability of human failures by recruiting highly-skilled experts to carry out activities directly affecting and affecting the safety of nuclear installations.
7. Reduce the share of operating events caused by human failures through systematic training and overall preparation of nuclear installation staff.
8. Get improved continuously in all activities and processes relating to nuclear installations.
9. Ensure through developing the corporate culture that the utmost meeting of the nuclear safety and radiation protection requirements is not only a duty but also a matter of honour and of course part of the performance of activities by all employees concerned.

To achieve primary safety requirements principles of nuclear safety and radiation protection have been set to deliver the safety goals. Following is their abridged text:

1) Nuclear safety and radiation protection is overriding and takes precedence over the other interests of the company.
2) Nuclear safety and radiation protection is the responsibility of each SE, a. s., employee to the extent of their competences, responsibilities and duties.
3) The safety culture principles apply in all activities relating to nuclear installations.
4) In nuclear installation designs and activities relating to operation of nuclear installations is applying the defence in depth strategy.
5) System safety implementation is undertaken throughout the life cycle of operational, communication, information subsystems, facilities and structures.
6) Systems and components of relevance to safety are periodically tested with a view to checking them up for functionality and serviceability.
7) Safety audits of the respective safety systems are conducted on a periodic basis.
8) The quality management system is developed in line with the requirements of the Slovak Republic's body of laws, regulatory authorities, IAEA recommendations and the requirements of ISO 9001:2001 standards.
9) The latest knowledge and experience from operation of nuclear installations both internally and externally are permanently used.
10) International assessments and inspections are periodically used for independent assessment of nuclear safety and radiation protection standards.
11) An open dialogue with the public, local and regional state administration and self-governing authorities is brought to bear.
12) Currently appearing safety risks concerning nuclear safety and radiation protection are identified, analysed, classified, managed across management levels.
13) SE, a. s., outlays adequate material and financial means to deliver the safety goals and meet the safety requirements and principles, improve staff education and skills.

F.1.3 Obligations of license holders toward the regulatory authority

Nuclear energy can only be used for peaceful purposes and in accordance with the international treaties whereby the Slovak Republic is bound. Making use of nuclear energy without an authorisation or a license is prohibited.

The license holder is responsible for nuclear safety. The license holder shall be obliged to provide for sufficient financial resources and human resources for nuclear safety including necessary engineering and technical support activity in all areas relating to nuclear safety. The license holder shall pay to safety aspects attention taking precedence over any other aspects of the permitted activity permitted.

1. Within the scope of the permission or authorisation, the authorisation holder shall be liable to:

a) ensure nuclear safety, physical protection, emergency preparedness, including verification

thereof,

b) observe documentation reviewed or approved by the Authority; any deviations from the documentation is allowed after preceding re-assessment or approval by the Authority,
c) continuously and comprehensively evaluate the compliance with the principles and to ensure the practical implementation of the evaluation results,
d) adhere to the conditions of the permission or authorisation, to investigate without any delay any violation of the these conditions and to take remedial measures and to prevent such violations from their repeating,
e) observe with the limits and conditions of safe operation or limits and conditions of safe decommissioning; the Authority shall be notified, without any delay, of their violation, failure to adhere to them or their exceeding,
f) observe with the technical and organisational requirements laid down by the generally binding legal regulations,
g) render, upon the Authority carrying out inspection activities, Authority inspectors the necessary assistance pursuant to the specific regulation to provide inspectors with personal protective means to be able to carry out inspection activities, to render necessary assistance to persons invited by the Authority for evaluation of issues related to the performance of the inspection activities, allow access to the necessary documentation or provide other information under Authority's competence at Authority's request, even if they do not relate to the inspection activities,
h) enable management of nuclear material, radioactive waste and spent fuel only to authorisation holders for management thereof pursuant to Atomic Act,
i) to perform working activities only by persons who meet the requirements mentioned in Atomic Act (Sec. 24),
j) submit to the Authority any modifications for permission or approval, at least one month prior to its foreseen implementation, or without any delay notify non-significant modification to the Authority,
k) inform the public about the nuclear safety assessment status,
l) inform the Authority without any delay of the opening of bankruptcy proceedings or rejection of bankruptcy proceedings because of lack of assets,
m) submit to the Authority classification of nuclear installation and nuclear material into the respective categories concerning the physical protection,
n) work out preliminary on-site emergency plan and on site emergency plan as well as source documents for off-site emergency plan and emergency transport order,
o) notify the Authority demonstrably and without any delay, about interventions taken with the aim of averting incident, accident or remediation of their consequences,
p) notify, in accordance with the approved physical protection plan, the Authority in writing of any aviation activities at nuclear installation premises and in their immediate vicinity.

2. The authorisation holder shall be liable to submit to the Authority sufficiently ahead of time prior to the expiration date of authorisation, while taking into account the deadlines defined in Atomic Act, the application and relevant documentation for issue of authorisation for the relevant activity to be continued.

3. The authorisation holder shall be liable to enable Authority inspectors, persons invited by the Authority as well as authorised persons of international organisations carrying out inspections in accordance with the international commitments of the Slovak Republic, access to premises and places of nuclear installations in which nuclear materials are located, and to render them the necessary assistance upon the performance of their activities.

4. Authorisation holders for shipment of radioactive material and State authorities responsible for off-site emergency plans at regional level shall enable Authority inspectors, persons invited by the Authority as well as authorised persons of international organisations carrying out inspections in accordance with the international commitments of the Slovak Republic, access to documentation , premises and facilities to which the relevant emergency plans are concerned to.

5. The authorisation holder shall be liable to forward to the Authority data required by Atomic Act, and to the European Commission or another competent body of the European Union data required by the special regulations mentioned in Section 13 in Atomic Act, as well as additional data required by international agreements that the Slovak Republic is bound by in relation to the European Union in respect of non-proliferation of nuclear weapons. At the same time, authorisation holder shall be liable to deliver to the Authority data required by the special regulations.

6. The authorisation holder shall be liable to notify the Authority in writing of any changes in facts on the basis of which permission or authorisation were issued and of any facts which might result in modification or cancellation of the permission or authorisation. Such notification shall be made within 15 days of the occurrence of such change.

The authorisation holder of the commissioning of a nuclear installation, operation of a nuclear installation, except repositories, and the authorisation holder of decommissioning stage or holder of authorisation of transport of radioactive materials shall be liable for nuclear damage under the international treaty the Slovak Republic is bound by.

Holder of operational license of nuclear facility is obligated to provide Radiation protection regulatory body particularly this information:

Urgently:
- radiation event, accident and emergency,
- overload of exposure limit of employees,
- overload of discharge limit.

In scheduled terms:
- information about operation,
- individual doses of employees and contracted employees in individual periods of monitoring,
- analyses of doses during shut down period,
- annual evaluation of individual and collective doses for employees and contracted employees,
- quarterly and annually- balance of radioactive discharges to the environment,
- annual report on results of environment monitoring,
- annual report on results of model environmental impact assessment based on influence of discharges.

The license holder shall issue operating procedures for the performance of activities on a nuclear installation, in particular service, maintenance, control and testing of classified equipment. These procedures shall be in accordance with the license terms and conditions. The license holder shall update and complete the procedures according to the current state of the nuclear installation.
The operator is imposed the duty to report ÚJD SR events on nuclear installations and in the case of accidents and breakdowns also other organisations and the public, take action to prevent them from recurrence.

The duty is stipulated for the license holder to provide the public with nuclear safety information. The duty shall lead to no change in ÚJD SR obligation to provide the public with its own independent assessment.

In practice, the operator of a nuclear installation use other necessary specialised organisations, be it in the field of maintenance, operation or research. These specialised organisations have the function of so-called support organisations, involved through their activities in providing reliable and secure operation of nuclear installations, as works they carry out the operator is not positioned to ensure with own human resources, nor in organisational, technical and knowledge terms.

F.2. Human and financial resources

F.2.1 Human resources

High-quality human resources are along with sufficient financial resources a prerequisite for ensuring secure, reliable and environment-friendly management of radioactive wastes and spent fuel. The functioning organisational structure concerning the provision for human resources of license holders for RAW management ensure pursuant to Act No. 541/2004 Coll. an adequate number of professionally competent and specially professionally competent employees so as to minimise the human factor adverse impact on nuclear and radiation safety.

In the light of the impact of activities on nuclear safety the license holder's employees are divided into two groups:
employees which have direct impact on nuclear safety – selected employees whose special professional competence has been verified (theoretical,written and oral exam and practical

examination) by an examining commission established by ÚJD, and to whom a Special Professional Competence Certificate was issued Special,
employees with impact on nuclear safety – professionally competent employees whose professional competence has been verified by an examination commission established by authorized specialized facility, by written and oral examination, and to whom a Professional Competence authorization was issued.

Also part of skills of these employees is the understanding of radiation protection and safety principles and procedures.

The license holder is responsible for professional qualification, special professional qualification, physical and mental competences of its employees. The license holder charges professionally qualified and specially professionally qualified employees with the performance of job activities by issue of an "Authorisation for the performance of job activities". This obligation stems from the Act as part of quality assurance of the license holder. The Authorisation for the performance of job activities is issued for the positions of licensed employees having a certificate of special professional qualification for a given type of nuclear installation and for the positions of professionally qualified employees with a certificate of professional qualification for a given type of nuclear installation.

In the organizational structure has each job position defined requirements on working qualification for the execution of the job position, that is, education, technical, health and eventually mental qualification and specified types of preparation. Immediate superior of employee is responsible for fulfilment of these requirements.

Training - acquisition, retention - and development of staff competences (knowledge, skills and attitudes) are undertaken with respective license holders by the „System of professional training of License holder employees" approved by ÚJD SR.

System of professional training of License holder employees is maintained so as to meet the requirements for training goals, needs and means and improved based on operating experience, effected organisational changes, technical solutions (upgrade) on equipment, requests from regulatory authorities, IAEA audits, inspections and recommendations. It is provided with required human, financial and material resources.

System of professional training of License holder employees is undertaken at a specialised facility operated by the training license holder. An authorisation is granted by ÚJD SR following considering technical equipment and verification of professional competence of employees carrying out theoretical training of selected employees and their simulator-assisted training. Training is undertaken in line with approved programs for training license holders´ selected employees and with reviewed programs for training license holders´ professionally competent employees.

Considerable element in increase of qualification of employees is co-operation with universities, especially by form of postgraduate and distance education on the Slovak Technical University, Economic University and Comenius University in Bratislava.

F.2.2 Financial resources

By the Act No. 254/1994 Coll. with effect from 1 January 1995 the State Fund of decommissioning nuclear power generating installations and treatment of spent nuclear fuel and radioactive waste (Fund) was established. Mentioned Act was afterwards amended by the following acts: Act No. 78/2000 Coll., Act No. 560/2001 Coll. and Act No. 291/2002. The main aim of amendments was especially modification how to create and use the resources of the Fund.
The Ministry of Economy administers the Fund and the funds resources are controlled deposited on the special account in the Treasury.
For the collection and use of Fund resources see the 2003 National Report.
In June 2004, the Slovak Government (Regulation (Recision) No. 626/2004) agreed to the draft procedure for restructuring the State Fund for Decommissioning of Nuclear Installations and Management of Spent Fuel and Radioactive Wastes according to the following principles:

a) the Fund will be set up by the law and administered as a public institution,

b) contributor to the Fund will be the operator of nuclear installations,

c) annual contributions to the Fund will be reassessed at regular five-year intervals starting 2005, taking account at the same time of the need for ensuring sufficient Fund resources; annual contributions for the period 2005-2009 will not exceed the level of the contribution paid in 2004,

d.) the contribution which the operator of nuclear installations makes toward the Fund will be part of the electricity price to end user and through it will be paid to the operator of nuclear installations up to the amount of the deficit that occurred by the effectiveness date of the new Act on the Fund for Decommissioning of Nuclear Installations over a 10-year period.

F.3. SE, a. s., Quality Management System

F.3.1 SE, a. s., mission and vision

SE, a. s´s., mission is to safely, reliably, effectively and competitively generate, supply and trade in electricity and heat, while permanently reducing their production process adverse environmental impact.
SE, a. s., vision is to secure a switch over to a **customer-oriented and process-managed company**, retaining favourable assets market value developments and directed to the level of leading companies on the European Union market in electricity, with a permanent possibility for self-realisation of employees as a significant factor of their interests and formation of a positive relation to the company development.

F.3.2 SE, a. s., policies / concepts

SE, a. s., overall objectives and direction of action on quality, the environment and safety are laid down in policies / concepts declared by **SE, a. s., Board of Directors**. The declared policies take account of SR legislative requirements and international organisations´ recommendations.
SE, a. s., Board of Directors has approved and declared:
Quality Policy laying down overall objectives and goals of the company formulated by top management on quality. SE, a. s., Quality Policy complies with the requirements of STN EN ISO 9001:2001.
Environmental Policy laying down overall objectives and goals of the company formulated by top management on environment conservation. SE, a. s., Environmental Policy complies with the requirements of STN EN ISO 14001:1998.
Safety Policy laying down overall objectives and goals of the company formulated by top management on safety. **BSE, a. s., Safety Policy** complies with the requirements of ISO/IEC 17799:2000 and OHSAS 18001:1999.
Electricity trading risk management policy describing SE, a. s., primary principles relating to the issues of measurement and management of risks linked to trading on the market in electricity.

F.3.3 SE, a. s., goals

SE, a. s., long-term strategic goal is to generate as much electricity as the company is capable to sell with reasonable profit so as remain a competitive and thriving company.
This goal results from Slovakia´s national economy policy that, also with respect to joining the EU, has proceeded to liberalisation of the market in electricity. SE, a. s., strategic goals, including the company´s mission and vision, are part of SE, a. s., Strategic Plan for 2003 - 2005.
Top management sets the company goals to deliver the contents of the company mission and vision. According to the time horizon for which goals are defined these are divided into annual, medium-term and long-term.
SE, a. s., Board of Directors sets SE, a. s., goals for the respective years to accomplish the quality policy and other policies/concepts. These SE, a. s., goals are proposed by the respective managing and executive directors of divisions in charge of given activities and approved by the company´s top

management. SE, a. s., goals are elaborated by the respective managing and executive directors of divisions and section directors into division and section tasks and plant directors into plant goals.
SE, a. s., goals are defined so as to be:

- time-limited, measurable and can be evaluated,
- really achievable,
- comprehensiv,
- usable and attractive for the company,
- economically justifiable.

F.3.4 SE, a.s´s., Quality Management System

SE, a. s., Quality Management System (QMS) is a system of managing the company by the company management which integrates the management of all the components of organisation business into a single (integrated) system with the aim of optimally meeting the mission, obligations and goals of the organisation.
SE, a. s., QMS is based on the mission and vision of the company, Quality Policy, other concepts/policies approved by SE, a. s., Board of Directors and the fundamental documents of the company, respecting all requirements of SR body of laws and international agreements on the use of nuclear energy, environment conservation and occupational health and safety.
A major part of the requirements are those from regulatory authorities (ÚJD SR, NIP SR, ÚVZ, etc.) to ensure reasonable standards of nuclear safety, occupational health and safety and the minimisation of negative environmental impacts. These requirements are applied at all phases of life of our generating facilities and in managing specified activities from their design, through planning, implementation, control, evaluation to feedback.

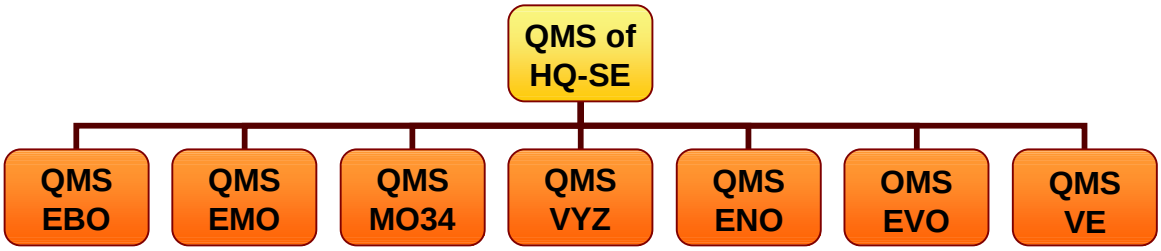
F.3.4.1 SE, a. s., QMS structure

SE, a. s., Quality Management System (QMS) is a system to manage the company where each of its employees has established clearly his/her position, duties, competencesm responsibilities and appropriate powers.
Any employee who can affect the quality, the environment or safety carries out their work according to pre-developed written procedures and makes specified records on work done.
This system allows to:

- **carry out work correctly right for the first time and every time,**
- **analyse** contingent non-conformities,
- take corrective and preventive action, evaluate its efficiency and effectiveness.

SE, a. s., QMS is structured by identified activities / processes and consists of partial QMS´s of SE, a. s., respective organisational units.
SE, a. s., QMS consists of:

- SE, a. s., **HQ** QMS,
- plant QMS.



SE, a. s., QMS is developed and based on the company process management principles, comprised of activities / processes of relevance to the fulfilment of the company mission.

From this perspective processes are divided and defined so as to cover the scope of all activities carried out in the respective organisational units, having regard for their professional specifics.
In terms of their location and applicability in the respective organisational units the activities / processes are divided into three groups as follows:

- **QMS basic activities / procesy** - are derived from meeting the requirements of QMS standards and are usually implemented in each of SE, a. s., organisational units.
- **QMS specific activities / processes of relevance to nuclear safety and radiation protection** - are activities / processes specific for nuclear energy aimed to ensure the requirements for nuclear and radiation safety and control thereof. They are only carried out in relation to nuclear installations and are not applied at the plants SE-ENO, SE-EVO and SE-VE.
- **Other QMS specific activities / processes** - are not directly defined requirements of SE, a. s., QMS standards but largely affect the running and management of the company or may be specific for certain organisational units.

F.3.4.2 SE, a. s., QMS and SE, a. s., contractors

SE, a. s., may set the performance of certain activities / processes and services with external organisations (suppliers) or procure supplies of products impacting nuclear safety from external contractors. Such being the case, the overall responsibility for nuclear safety and compliance with QMS requierements always rests with SE, a. s.
The passage of SE, a. s., QMS requirements over to the contractor is ensured by SE, a. s., through contracts, The contracts require the contractor to:

- have a QMS in place;
- develop and submit for approval a quality plan for its supply, applying therein the requirements of corresponding part of SE, a. s., QMS;
- allow to conduct a customer (external) conduct by SE, a. s. (including participation by a state special regulatory authority - e.g. ÚJD SR - in selected orders);
- pass the quality requirements over to its subcontractors as well.

F.3.4.3 Project "SE, a. s., QMS transformation into SE, a. s., Integrated Management System"

The project is one of the crucial steps toward meeting SE, a. s., Strategic Plan for 2003 to 2005, which was discussed and approved by SE, a. s., Board of Directors. The switchover to a customer-oriented company and enhancing its competitiveness are conditional not only on change in management but also in particular on change in staff way of thinking and approach across management levels - change in the corporate culture.
The implementation of SE, a. s., Integrated Management System (IMS) constitutes a transformation of SE, a. s., existing QMS into SE, a. s., IMS based on the process approach that it will integrate:

- the Quality Management System (this make sup the framework and the respective tools for integration), the Environmental Management System and the Occupational Health and Safety Managemment System;
- management of risks, finance and other areas crucial in the light of economically and financially effective management of the whole company SE, a. s.

The change to the company management system is designed so that SE, a. s., IMS is:

- effective;
- customer-oriented;
- process-oriented;
- flexible in changes;
    - user-friendly;
    - allowing for continual systematic improvement of processes;
    - integrating - having regard for all management aspects, particularly quality, safety, the environment and finance (economics).

F.3.4.4 Plan for SE, a. s., IMS project

Based on the approved Project and Analysis of the current state of QMS, the Environmental Management System (EMS) and the Safety Management System (SMS), the project plan is the underlying project management document "Transformation of SE, a. s., Quality Management System

into an Integrated Management System“ and integrates all planning, management and control activities defined during the project preparation.
The primary purpose of the project is to create a unit management system of the company integrating quality management, environmental management and safety management into a single integrated management system with the aim of optimally fulfilling the mission, obligations and goals of the organisation.
The primary objectives of the project:

- Transform the current QMS into a quality management system according to the requirements of ISO 9001:2000 in areas where the process approach is not yet applied.
- According to the newly-designed QMS, consider and finalise the process approach based EMS and SMS.
- Integrate QMS, EMS and SMS into a uniform IMS.
- Implement the proposed IMS into practice.
- Prepare the company for QMS, SMS certification in accordance with the requirements of ISO 9001:2000 and OHSAS 18001:1999.

Limit conditions:

- SR body of laws (Act No. 541/2004 Coll., Atomic Act, etc.),
- IAEA regulation 50-C/SQ-Q (Quality assurance for safety at nuclear power plants and other nuclear installations),
- ISO 9001:2000 Quality Management Systems. Requirements,
- ISO 14001:2004 Environmental Management System - requirements with instructions for use,
- OHSAS 18001:1999 Safety Management System and Occupational Health and Safety Management System. Requirements,
- STN 01 0380: 2003 Risk Management,
- and others.

F.3.5 Role of regulatory body

Activities and tasks of ÚJD with respect to the execution of State supervision in the field of nuclear safety of nuclear installations and quality assurance were set forth in Act No. 130/1998 Coll. and ÚJD Regulation No. 317/2002 Coll., currently in Act No. 541/2004 Coll. ÚJD SR regulates the organizations responsible for the quality assurance of classified equipment as mentioned in the Regulation and checks their compliance with these requirements how such quality assurance programs are being implemented. Both ÚJD SR and the responsible organizations - operators of nuclear installations accept the International Atomic Energy Agency’s documentation, and use them as widely as possible in defining their own criteria and procedures related to the assurance of nuclear safety and quality at classified equipment.

ÚJD SR’s philosophy in this respect is based on the fact that in addition to nuclear installation design, multiple barriers and appropriate technical and organizational measures, nuclear safety of every nuclear installation is also achieved through the required quality of selected installations and the corresponding activities. The quality system described by quality assurance program serves to maintain and develop quality.
In exercising State regulation in the field of quality assurance, ÚJD SR focuses on two basic activities:
1. Approval of quality assurance systems
This is done at two levels:
Review, approval and control of quality assurance input programs of the responsible organizations and of partial programs of quality assurance for specific stages of the nuclear installation life cycle as set forth by the input program (e.g. design, construction, start up, operation, decommissioning etc.).
Review, approval and control of individual programs of quality assurance developed for the individual selected installations or groups of selected installations in accordance with the classification by their significance with respect to nuclear safety.
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Review, approval and control of individual programs of quality assurance developed for the individual selected installations or groups of selected installations in accordance with the classification by their significance with respect to nuclear safety.

2. Inspections of quality assurance programs implementation

ÚJD SR inspectors use quality assurance-related inspections to also check how the responsible organization in question and its suppliers meet the requirements laid down by CSKAE Decree No. 436/1990 Coll., the criteria set forth by ÚJD SR decisions issued, and how they implement the approved documentation of quality assurance. As soon as the respective quality assurance program has been approved, inspection activities focus on the control of meeting of its individual requirements and on the practical implementation of the requirements, i.e. compliance of actual activities with approved documented procedures. The draft protocols of the inspections are consulted with the managers of the responsible organizations. If non-compliance is identified at selected installations concerning activities or documents, inspectors are authorized to order measures to eliminate such discrepancies. Inspections are performed according to the approved program, they have their objectives and a documentation format.

In addition to the above mentioned activities in the field of supervision of quality assurance regulation at selected installations, ÚJD SR is also responsible for the enforcement if requirements set forth in applicable generally binding legal regulations or ÚJD SR's decisions or by inspections are not met. As a rule, this is mostly done by negotiating with the responsible organization, withholding of approval of inappropriate quality assurance programs, follow-up or extraordinary inspections and - as a last resort - by imposing penalties.

F.4. Radiation protection

F.4.1 Legislation in radiation protection and its implementation

The Act No. 272/1994 Coll. on Human Health Protection, as amended, and Regulation of MoH SR No. 12/2001 Coll. is based on the philosophy of the recommendation ICRP 60 of 1990, International Basic Safety Standards, SS No. 115 of 1996, and also respects provisions of EU Council directives and regulations for radiation protection.

F.4.2 Implementation of radiation protection legislation

The Act No. 272/1994 Coll., as amended, and the respective Regulation of MoH SR No. 12/2001 Coll. implements all directives and regulations of the Euratom Council related to the issue of radiation protection in nuclear facility, such as:

Directive of the Council No. 96/29/Euratom of 13 May 1996, which establishes the basic safety standards of personnel and public health protection against dangers due to ionising radiation,
Directive of the Council No. 90/641/Euratom of 4 December 1990 on protection of external staff exposed to the ionising radiation risks during their activities in the controlled area,

The quality assurance system of Slovenske elektrarne, a. s., has implemented the applicable acts in the "Basic Directive" for radiation protection. Subsidiaries of SE have incorporated the national legislation as well as recommendations of international organisations (ICRP and IAEA) in directives, work procedures, human exposure limits, and limits for release of radioactive substances into the atmosphere and waters.

Based on the ALARA Commission recommendations, dose and exposure limits for the staff and individual SE-VYZ staff categories have been specified for the one-year period, while the set intervention levels, where the cause of exceeding is assessed and relevance justified, are lower than legislation-set limits.

Radiation protection principles, particularly the ALARA principle and dose and risk limiting principle, are considered for all works.

Limits for release of radioactive substances into the environment are subject to approval following the proposal from the operator by regulatory authorities. The limits are purposed to ensure that effective

doses of an individual of the population in normal and abnormal operational conditions will not be exceed limits specified by the national legislation and international recommendations.

F.4.3 Systems of atmospheric and hydrospheric emission monitoring systems

Radioactive discharges into the environment from nuclear installations are carried out in accordance with Slovak legislation (Slovak Health Ministry Regulation No. 12/2001 Coll.) and pursuant to decisions by regulatory authorities, i.e. particularly the Chief Environmental Health Officer of the Slovak Republic, the District Environment Office, ÚJD SR, and in line with the ALARA principle. The decisions lay down under what conditions radioactive substances can be discharged into the environment, what the operator is obliged to specify and evaluate and what balance limits for radioactive discharges are.

Atmospheric radioactive discharges are continuously monitored in ventilating stacks of nuclear installations (radioactive rare gases, aerosols, iodine ^{131}I) to control for non-excess of daily limits. Samples are at the same time taken in the samplers with a view to ascertaining the radionuclide composition and balancing. In the samples taken the values for released radioactivity of aerosols and iodine ^{131}I are established unsing a gammaspectrometric analysis, a radiochemical analysis of the value for ^{89}Sr and ^{90}Sr and an alphaspectrometric analysis of the value for transurania ^{238}Pu, $^{239+240}$Pu and ^{241}Am. Furthermore, the values for tritium ^{3}H and carbon ^{14}C are established.

Liquid discharges are monitored at the source. This means that the values for total volumetric activity and possibly for volumetric activity of tritium, of samples taken from tanks of the respective technologic units are measured before they are discharged. Based on the results of the analysis and comparison with limit values, waters from the tanks return back to technologic processes or go to the treatment plant for treatment or are discharged into the environment via the waste water control plant where they are continuously monitored for total gamma activity. The total volume of discharged waters is obtained through monitoring the amount of waters discharged from the controlled tanks.

The values obtained from the follow-up measurements are used to balance liquid RA-discharges. Tritium values are obtained by laboratory evaluation, using a liquid scintillation spectrometer, of samples obtained by taking from the control tanks before they are discharged. Data for corrosion and fission products, obtained using a gamma-ray spectrometry analysis of the monthly mixed concentrated samples. Strontium values are obtained using a laboratory radiochemical analysis, as are transuranium values using an alpha-ray spectrometry analysis of the mixed concentrated sample.

The values obtained from continuous measurements of gamma detectors positioned in the waste water measurement unit are used for the secondary control for non-excess of the concentration limits for activity of corrosion and fission product radionuclides in liquid RA-discharges and to ascertain a possible unplanned discharge (eventually for a discharge over a non-design path).

The limits for atmospheric and hydrospheric radioactive discharges are set out in the annex hereto.

The values for atmospheric and hydrospheric radioactive discharges from SE-EBO and SE-EMO between 2000 and 2004 are set out in the tables below (Table F.4.3a) and Table F.4.3b). It can be stated that in both 2004 and all the previous years the limits for radioactive discharges had not been exceeded, with corrosion and fission product discharges and atmospheric discharges being well below the authorised limits. Increased iodine 131 discharges at SE-EBO were caused by a fuel leak following the primary circuit technology unsealing (untight fuel assemblies were identified at the NPP V-1).

Table F. 4.3a.)

Atmospheric radioactive discharges from SE-EMO in 2000 to 2004

	Inert gases		Iodine I-131		Aerosols	
Year	Discharge [GBq]	Per cent of the limit	Discharge [MBq]	Per cent of the limit	Discharge [MBq]	Per cent of the limit
2000	14,412	0.352	56.53	0.084	10.92	0.0064
2001	12,712	0.310	14.65	0.022	17.77	0.0105
2002	11,419	0.279	14.93	0.022	8.18	0.0048
2003	10,805	0.264	1.93	0.0029	12.52	0.0074
2004	3,145	0.077	2.18	0.0032	8.12	0.0048

Atmospheric radioactive discharges from SE-EBO+SE-VYZ in 2000 to 2004

	Inert gases		Iodine I-131		Aerosols	
Year	Discharge [GBq]	Per cent of the limit	Discharge [MBq]	Per cent of the limit	Discharge [MBq]	Per cent of the limit
2000	14,642	0.179	675.55	0.500	760.65	0.211
2001	23,393	0.285	560.08	0.415	219.12	0.061
2002	32,696	0.817	2,589.5	1.992	213.15	0.133
2003	17,421	0.436	273.12	0.210	192.09	0.120
2004	40,787	1.020	3,677.5	2.829	153.09	0.096

Table F. 4.3b.)

Hydrospheric radioactive discharges from SE-EMO in 2000 to 2004

	Tritium		Corrosion and fission products	
Year	Discharge [GBq]	Per cent of the limit	Discharge [MBq]	Per cent of the limit
2000	10,484	87.4	57.93	5.3
2001	9,248	77.1	72.41	6.6
2002	9,130	76.1	49.36	4.5
2003	10,714	89.3	40.88	3.7
2004	9,826	81.9	37.84	3.4

Hydrospheric radioactive discharges from SE-EBO + SE-VYZ in 2000 to 2004

	Tritium		Corrosion and fission products	
Year	Discharge [GBq]	Per cent of the limit	Discharge [MBq]	Per cent of the limit
2000	13,422	30.71	207.07	0.539
2001	18,383	41.65	140.03	0.365
2002	16,404	37.54	172.48	0.454
2003	15,233	34.56	167.10	0.440
2004	15,268	34.94	158.56	0.417

The average collective effective dose (CED) of the respective SE plants for 2000 to 2004 is graphically illustrated in Table F 4.3c). The profile of the values clearly suggests a trend of gradual CED decrease and a steady trend. The moderate increase in CED at V2 in 2003 and 2004 is caused by the extended scope of works duering GO because of NPP modernisation.
The CED values achieved in 2001 to 2004 are on the whole favourable as compared to WANO average on PWR and reflect a systematic approach of NPP operators to optimisation of doses. CED is permanently at a low average level, which testifies to the very good level of its control by applying the ALARA principle. For the above period an excess of the exposure limits occurred with none employee of SE, a. s., and of the contractor.

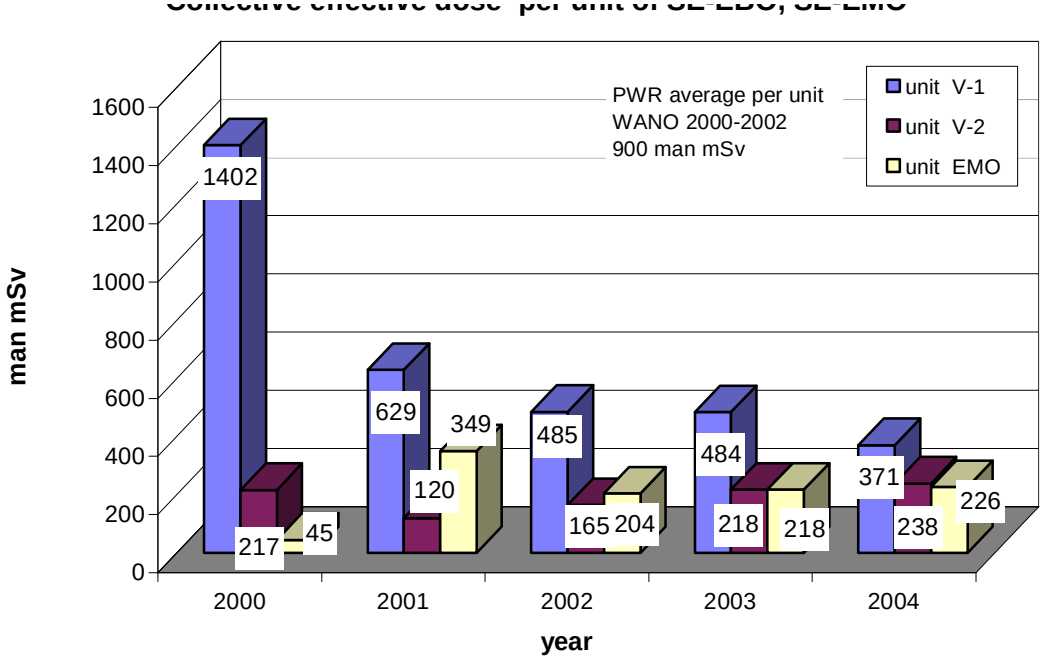


Table F. 4.3c.) Average collective effective dose per unit of SE-EBO and SE-EMO

F.4.4 Monitoring of environmental impacts

For description of the monitoring system see the 2003 National Report.

Table 4.4.1a) Calculated IDE for population groups around Bohunice NPP

Year	IDE [Sv]		
	Infants	Age of 7-12	Adults
1998	1.64 E-7	1.11 E-7	6.61 E-8
1999	6.63 E-8	8.67 E-8	8.29 E-8
2000	1.49 E-7	2.05 E-7	1.92 E-7
2001	1.79 E-7	2.31E-7	2.28 E-7
2002	1.96 E-7	2.25 E-7	2.21 E-7
2003	7.59 E-8	9.33 E-8	8.96 E-8
2004	1.32 E-7	1.49 E-7	1.46 E-7

The IDE are considerable lower than IDE received by the population from the natural background. The individual dose equivalent from the natural background around Bohunice and Mochovce NPP is 100 to 10000 times higher than the values presented in the tables. Moreover, IDE calculations are characteristic with a considerable conservativeness and are actually overvalued as compared to the real ones, since the entry data estimate, particularly the consumption of foods grown in the local area and water, and their impact on the result of the radiological impact calculation, is complicated.

Calculation results for the three most loaded population groups in the both areas are presented in the tables 4.4.1a.) and 4.4.1b.)

Table 4.4.1b) Calculated IDE for population groups around Mochovce NPP

Year	IDE [Sv] NPP Mochovce		
	Infants	Age of 7 - 12	Infants
1998	1.00E-7	8.60E-8	6.80E-8
1999	3.77E-7	2.79E-7	2.09E-7
2000	6.67E-7	4.85E-7	3.59E-7
2001	5.82E-7	4.23E-7	3.17E-7
2002	5.74E-7	4.17E-7	3.13E-7
2003	6.68E-7	4.84E-7	3.59E-7
2004	6.14E-7	4.46E-7	3.30E-7

ÚVZ SR monitors integral doses in the system of monitoring points around NPPs by the method of thermo-luminescent dose-meters, discontinuous dose-rate measurements in the system of monitoring points around NPPs, monitoring of activity of corrosion and fission product in fall-outs, aerosols, potable, surface and ground waters, in the soil, sediments, agricultural products and food chain elements produced in the vicinity of nuclear facility, random parallel analyses of aerosols in discharges and samples from waste water collection tanks prior to discharging.

F.4.5 Role of Regulatory Body

In accordance with provisions of respective legal documents, persons performing the national health supervision are authorised to enter plants and buildings, require information, take samples, make findings, and look at particular documents. In performing the supervision activities they focus on following the generally binding legal regulations, conditions defined in licence, measures and instructions issued by a health protection authority.

The radiation protection inspection is ensured by:

the system of information that the operator provides to a supervision office based on conditions defined in the licence for performance of activities resulting in radiation exposure,
on-site inspections.

According to the purpose, the inspections usually include radiation situation monitoring in a work environment, in the vicinity of nuclear facility, and in referential sites by own technical equipment. The purpose of the measurement is to provide an objective assessment of a nuclear facility operation impacts on the working as well as surrounding environment.

When performing the national health supervision on radiation protection, the staff monitor the following in particular:

radiation situation in a nuclear facility, while performing their own measurements,
adherence to approved documentation, its update and the method of record-keeping,
personnel doses, register of personnel doses in the nuclear facility, while performing their own analyses of the personnel doses,
monitoring of discharges, while performing random check-measurements of some radioactive discharge parameters,
application of radiation protection optimisation, and other.

Based on the observations the supervision staff prepare documents for a health protection authority decision-making on exposure-related activities, as well as in activities relevant to radiation protection and in taking measures, giving instructions or sanctions.

The national health supervision in the area of work environment performs monitoring of dose rates, aerosol activity, surface contamination, or other special measurements. In the vicinity of a nuclear facility they perform monitoring of integral doses in the TLD method and discontinuous measurements of dose rates in the monitoring point system, monitoring of activity of corrosion and fission products in fall-outs, aerosols, potable, surface and ground waters, in the soil, sediments, agricultural products and food chain elements produced in the vicinity of nuclear facility. Parallel analyses of aerosols in discharges and samples from waste water are done on a random basis.

F.5 Emergency preparedness

F.5.1 Legislation in the area of emergency preparedness

Currently the emergency preparedness legislation is based on acts and degrees of departments having the largest share in emergency preparedness and planning, particularly the following:
Act No. 541/2004 Coll. on peaceful uses of nuclear energy (Atomic Act) and on alteration and amendment to certain laws,
Act No. 272/1994 Coll. on human health protection, as amended,
act No. 42/1994 Coll. on civil protection of the public, as amended,
Slovak Interior Ministry Regulation No. 300/1996 Coll. on the public protection in the production, transport, storage and handling of dangerous substances, as amended,
Slovak Health Ministry Regulation No. 12/2001 Coll. on requirements for radiation protection,
Slovak Labour Safety Office Regulation No. 111/1975 Coll. on the registration of occupational accidents and on reporting operating accidents (breakdowns) and failures of technical items, as amended by Regulation No. 483/1990 Coll.
These fundamental acts and Regulations are supplemented with other laws on crisis management that partially interfere with the issues of emergency planning:
Constitutional Act No. 227/2002 Coll. on the safety of the state at the time of war, state of war, state of emergency that concerns, inter alia, handling situations relating to acts of terror and violent unlawful action.
Act No. 387/2002 Coll. on management of state in crisis situations outside of the time of war and state of war,
Act No. 129/2002 Coll. on the integrated rescue system,
Act No. 261/2002 Coll. on prevention of severe industrial accidents.
The above documents take into consideration in the field of emergency preparedness the relevant EU directives and Vienna-based IAEA recommendations such as:
EÚ:
82/501/EEC: Council Directive of 24 June 1982 on the major accident hazards of certain industrial activities,
87/600/Euratom: Council Decision of 14 December 1987 on Community arrangements for the early exchange of information in the event of a radiological emergency,
89/618/Euratom: Council Directive of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency,
IAEA:
Safety Series GS-R-2: Preparedness and response to nuclear or radiation accidents - requirements,
Safety Series 50-SG-06: Operator's preparedness to emergency situations at NF,
Safety Series 50-SG-66: Preparedness of public administration authorities to emergency situations at NF,
Safety Series 55: Emergency response planning in NF surroundings in case of a radiation accident at NF,
Safety Series 72. Rev. 1: Protection in uncontrolled radioactivity source accidents,
TEC DOC 953 – Methods of emergency response preparation for nuclear and radiation accidents,
TEC DOC 955 – Basic assessment procedures to determine protective measures for reactor accident,

F. 5.2 Emergency preparedness, legislation and implementation

F.5.2.1 National emergency preparedness organisation

Under Act No. 387/2002 Coll. on management of state in crisis situations outside of the time of war, the Slovak Government set up as its executive body a Central Crisis Headquarters (hereinafter referred to as CCH). All the ministries and other central state administration authorities are represented in CCH. CCH co-ordinates activities of state administration, self-government and other components in handling a crisis situation, i.e. in relation to ÚJD SR also in handling an accident or breakdown of a nuclear installation or in transport. However up and running in parallel with this executive Slovak Government body is a Commission of the Slovak Government on radiation accidents (hereinafter referred to as CRA), which under its Statutes approved by a Slovak Government Regulation is a consultative and co-ordination body for the uniform preparation and

implementation of measures to protect the public and the environment from the effects of emergencies involving radiological effects in the event of their occurrence or possible occurrence on the Slovak Republic´s territory and outside of it.
To ensure necessary measures to cope with a nuclear facility emergency and measures to protect the public and economy during events with environmental impacts, the national emergency preparedness organisation (Fig. F.6.2.1) is split to three levels.

The first level is formed by emergency committees of nuclear facilities with the prime function comprising the control of works and measures on nuclear facility sites so as to allow for check of technological equipment conditions, and the control of measures to cope with emergency and mitigate consequences on personnel, plant, environment, and public.

Yet another function at this level is the information function for activities of state administration authorities at regional, district and self-governing levels which will provide information on the state of installations and possible environmental impacts.

Second level is organised at regional level and consists of crisis headquarters of regions and districts and their appropriate crisis headquarters whose territory belongs in the area under threat, in which life, health or property may be threatened and where public protection measures are planned. This territory is established by a 30 km range around the Bohunice nuclear installation and 20 km around the Mochovce nuclear installation.

Third level consists of the national (nation-widej) level of CCH and CRA with its special support units (ÚJD Emergency Response Centre - ERC; Operative-Managing Group - OMG; Slovak Headquarters of Radiation Monitoring Network - SHRMN). The role of CCH is in particular to co-ordinate state administration authorities in handling a crisis situation. The role of CRA is in particular to co-ordinate and manage the preparations of measures focused on the protection from the effects of a radiation event, if the regional-level possibilities are exceeded.

Also part of this level is SE, a. s., Failure Commission that co-operates closely with ÚJD ERC and CRA. The primary role of SE, a. s., Failure Commission is in particular to organise and co-ordinate a quick elimination of the consequences of serious and emergencies events on the respective generating or distribution installations.

F. 5.2.2 Professional and technical resources of CRA:

ERC - Emergency Response Centre of ÚJD SR is a technical support centre of ÚJD SR for monitoring of NF operation and assessment of technical conditions and radiation situation in case of a nuclear or radiation event, and for making prognosis of the event development and consequences according to the Act 541/2004 Coll. on peaceful uses of nuclear energy (Atomic Act) and on alteration and amendment to certain laws. It is also a technical support centre for OMG established within CRA.
Operative-managing group (OMG) is a specialised consulting body of CRA established based on CRA's statute and Regulation. The OMG's task - based on a situation assessment in case of a NF event - is to process data and one common recommendation of involved departments for decision-making on measures to protect the public at CRA level. In making the recommendations it is closely co-operating with ÚJD ERC.
The Slovak Center of the Radiation Monitoring Network (SCRMN) is a technical support body established by MoH SR, where data from all radiation monitoring systems on the whole territory of Slovakia are centralised and assessed. This body has been established based on CRA's Regulation and statute.

F. 5.2.3 Emergency documentation

To cope with events at nuclear facilities and their consequences on the environment, an emergency documentation has been created, which defines a procedure and work organisation during every single level of emergency at various levels of emergency preparedness described in the chapter F. 6.2.1.

The holder of a license for operation of nuclear installations has developed preliminary internal emergency plans and internal emergency plans (hereinafter referred to as internal emergency plans) laying down the organisation of emergency response and its implementation relating to the handling of an emergency and staff protection, including the protection of health of staff and of persons taken care of by the license holder.

In addition, it has developed operating procedures allowing to recognise and classify an emergency by international recommendations.
At regional level there are developed public protection plans in the area under threat containing measures to protect the public, health, property and the environment as well as linkage to the internal emergency plan.
At national level there is developed the so-called National Emergency Plan involving all procedures and measures of the respective members of the Slovak Government Commission on Radiation Accidents. CRH approved it 29 November 2001 and thus the National Emergency Plan (NEP) is binding on CRA members. In addition, emergency procedures and plans for ÚJD ERC and SE, a. s., Failure Commission are developed at national level.
All of the above plans fully apply both the national legislation provisions and the IAEA international recommendations and the EU directives referred to in F. 6.1.

F.5.3 Internal emergency plans of the license holder

On-site emergency plans and the related documents are developed so as to provide for the protection and preparation of the staff for the case of the occurrence of a significant leakage of radioactive substances into the working environment or the surroundings, and measures will have to be taken to protect the health of people at the level of the nuclear installation or of the population in adjacent areas.

In-site emergency plan mainly describes:

the system of classification of events,
evaluation procedures and their consequences,
the organization structure of emergency response and the responsibilities within it,

- persons on the nuclear installation territory and in the area under threat,
- system of notification of persons in the NI territory and in the area of threat and public warning,

emergency response facilities and means,
protective measures and method of their implementation,
medical measures plan,
principles of recovery,
cooperating external organizations and bodies,
the system of training of staff and members of emergency response organization,
methods of informing of the public.

The purpose of the internal emergency plan is to ensure the preparedness of nuclear installation staff for implementation of the planned measures in the case of a nuclear installation event, with emphasis on assurance of the basic goals:

- reduce the risk or mitigate the consequences of the nuclear installation event at its source on the installation, staff and residents in the surrounding area of the nuclear installation,
- prevent severe health damage (e.g. death or severe injury),
- reduce the risk of the probability of the occurrence of stochastic effects on health (e.g. cancer and serious inheritable phenomena).

The aim of the internal emergency plan is to provide for activity of the emergency response organisation (ERO), i.e. planning and preparation of organisational, personnel and material and technical means and measures for successfully handling crisis and emergency situations according to the classified event. ERO consists at SE EBO and SE EMO of the following units:

- Emergency Managing Centre (EMC),
- Technical Support Centre (TSC),
- Operating Support Centre (OSC),
- External Evaluation Centre (EEC),
- Information Centre (IC).

Description is set out in F. 6.7.
The information flow starts as early as the occurrence of an event (Act No. 541/2004 Coll.) that is reported to ÚJD, Slovak Load Dispatching Centre (SED) and thereafter to SE, a. s., emergency service.

The very information flow process during an emergency involves regulatory authorities (ÚJD, ÚVZ SR), SE, a. s., HQ, Slovak Headquarters of Radiation Monitoring Network (SHRMN) and crisis headquarters at regional level. The flow of information on the state of technologic equipment and

critical safety functions between the nuclear installation and ÚJD ERC takes place on-line under Act No. 541/2004 Coll. and the original agreement between SE, a. s., and ÚJD.

F.5.4 Public protection plans (off site emergency plans)

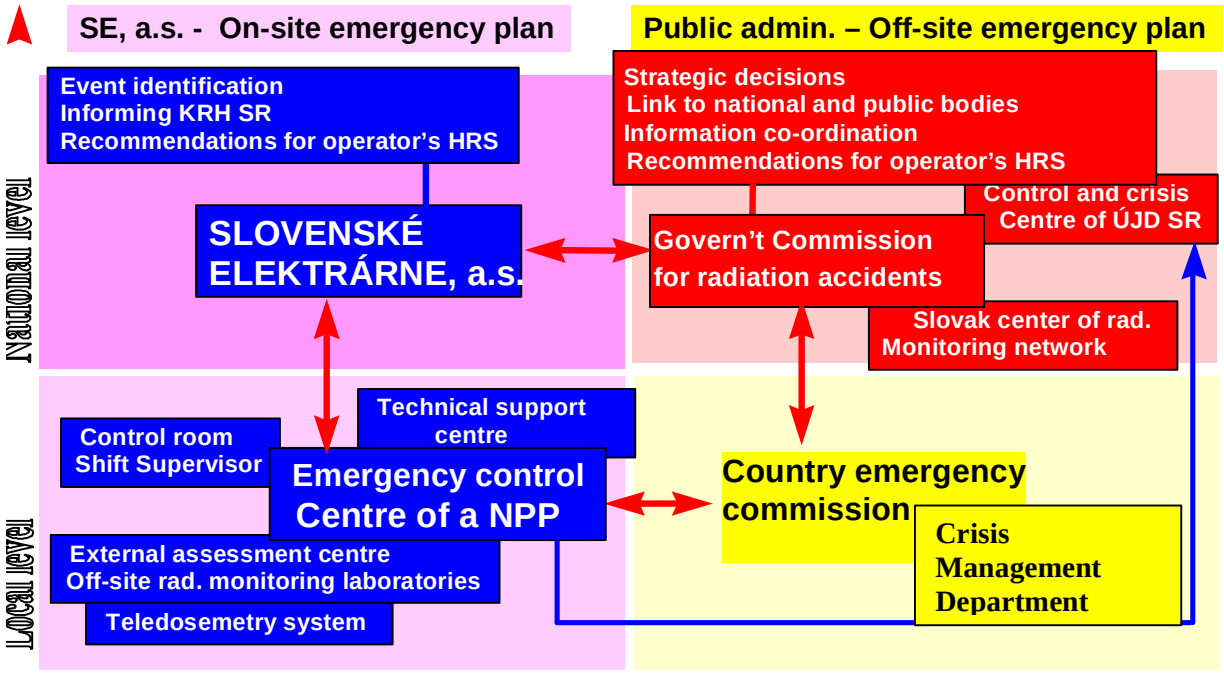
Public protection plans for the case of a nuclear installation accident (hereinafter referred to as "Public Protection Plans") are developed by regional and district offices whose territory lies in the area under threat defined by the distance within 30 km in the case of SE-EBO and within 20 km in the case of SE-EMO. Municipalities lying in the area under threat prepare abstracts of the public protection plans of the appropriate district and implementing documents to carry out the measures planned. Said public protection plans follow up on the internal emergency plan of the holder of a license to operate NI who is obliged to submit the public protection plan developers background documents on the expected hazard in the case of an accident or breakdown.
The public protection plans are developed in co-ordination with MoI´s OCP and, following review by ÚJD and other state administration authorities and approval by the competent principal of the regional or district office, they are approved by MoI´s OCP.
In the occurrence of an emergency being a NI radiation event in nature, regional and district offices ensure the measures resulting from the public protection plans. The activity in question is carried out by the appropriate crisis headquarters that co-operate with CCH. These crisis headquarters have the status of a consulting, co-ordinating and managing body of the regional or district office principal for uniform assurance of the preparation and implementation of public and economy protection measures in the occurrence of a radiation event. The activity of the above headquarters is co-ordinated by CCH and the Slovak Government´s Commission on radiation accidents, which is a managing, consulting and co-ordinating body of the Slovak Government. To avoid the risk of delay in performing the public protection tasks, competent crisis headquarters are included in the emergency response organisation within SR (hereinafter referred to as ERO).
In the occurrence of a radiation event involving a radioactive leak the holder of a license to operate NI, in line with the internal emergency plan, the public protection plan and based on the assessment of technology situation, establishment of the source member, measured values of the teledosimetric system, the first measurements of the radiation situation in NI environs and the meteorological situation ensures promptly at a Degree 3 event the public warning and at Degrees 2 and 3 the notification of competent authorities and organisations in the area under threat. Subsequently, other urgent and follow-up measures resting particularly in iodine profylaxion, taking shelter, evacuation, ao., are taken by state administration authorities. Said measures are carried out in the areas afflicted by the radiation event consequences including those in which the consequences of the emergency may spread in the light of prediction.
Draft public protection measures are prepared and secured across management levels of state administration and ministries involved.
If the radiation event consequences go beyond the territory of one district, the public protection measures are co-ordinated by the competent regional office. If the scope of a radiation event goes beyond the territory of a region, the Slovak Government declares and calls off an emergency for the territory under threat to limit the impact of the accident and this activity is already provided under new legal rules by CCH.
In the case of a radiation event, CRA monitors continuously region-level activities, takes decisions in support for necessary measures of the public protection plan, creates prerequisites for their implementation, assesses their efficiency and co-ordinates regional commissions´ activities. Likewise, the regional office principal co-ordinates at regional level activities of districts under his competence. To this end CRA makes use of the conclusions and recommendations prepared by special and support units such as ORS, ÚJD ERC, SHRMN, which as a rule co-operate closely with competent regions as well.
In the case of a radiation event, the radiation situation monitoring and evaluation is the responsibility of SHRMN.

F.5.5 Emergency transport procedure

For the purposes of transport of spent fuel, nuclear materials and radioactive wastes the transporter develops pursuant to the Atomic Act emergency transport rules (ETR). The aim of these ETR´s is to ensure that preventive and protective measures are taken in the case of an accident or incident during transport. The holder of a license for transport develops emergency transport procedures for transport within the Slovak territory. Once examined by ÚJD and other authorities concerned, ETR are approved by the Slovak Ministry of Transport, Posts and Telecommunications.

F.5.6 Systems of public warning and informing

Public warning and informing the bodies, organisations, and personnel is done in accordance with the Act No. 42/1994 Coll. on Civil protection of the public as amended. Competencies and tasks of respective bodies and organisations in ensuring emergency preparedness are specified by the "Agreement on mutual co-operation in ensuring emergency preparedness" between the Civil Defence Office of the Ministry of Interior and SE, a. s. (Fig. F. 6.2.1).



The warning of the public and the notification of authorities and organisations within a 30 km range of the Bohunice site is secured technically using:

1. An external system of warning in the area under threat which consists of a system for mass remote control over the power distribution system (HDO). Control receivers HERKUL-S are used to warn the public - whereby 426 electric motor sirens located within a 30-km zone are controlled. The sirens can be controlled by sectors. Additional information for the public upon siren sound warning will be transmitted with electronic mass communication means.
2. An external system of notification of individuals that makes use of receivers HADOS making it possible to accept 7 signals which are used as follows: 1-standby EBO, 2-standby Bohunice, 3-emergency Bohunice, 4-accident Bohunice, 7-functionality check-up. Mayors of municipalities and towns, large-scale enterprises, other institutions and all CRA members are equipped with these receivers. The notification of authorities and organisations is ensured in addition to HDO also through public telephone networks. The automatic person telephone notification ZU 1619 APC ZUZANA is used to speed up and automate the notification.

The warning and notification of Bohunice staff is secured technically using:

1. An internal warning system consisting of 3 transmitters, 105 small electronic sirens, 7 electric sirens and 103 light beacons.
2. An internal staff notification system at SE-EBO making use of SE-EBO in-house radio, SE-EBO radio network and the notification equipment ZU 1619 APC ZUZANA.

The shift engineer of the breakdown unit decides on the initiation of the public warning and the notification of authorities, organisations and staff. Periodic tests of notification using HADOS receivers are performed four times a year. Acoustic tests of warning using sirens are conducted on a monthly basis.

The warning of the public and the notification of authorities, organisations and staff within a 20-km range of the Mochovce site is secured technically using:

1. A system of warning built based on radio-controlled electronic sirens. The system can run for 72 hours without supply from the power distribution network, allows for selective control of the

sirens, transmission of voice information and continuous control for the state and serviceability of the respective sirens.

2. A system of notification of authorities, organisations and staff based on a paging radio network. ERO members - EMO standby, mayors of municipalities and towns and emergency commissions´ and headquarters´ members.

Both systems at the NPP Mochovce are controlled from VYR-VAR control centre and from VYR-VAR backup control centre. Their startup is decided by the shift engineer or HRS head. The systems are tested periodically and kept in continuous serviceable condition.

F.5.7 Systems for maintaining emergency preparedness

At SE-EBO, SE-EMO and SE-VYZ staff are classified by the scope of emergency training under four categories:

Category 1 - staff with short-term stay at NI (visits, excursions, etc.),
Category 2 - staff permanently working at NI,
Category 3 - staff assigned in ERO,
Category 4 - mayors of municipalities and towns in the area of emergency planning.

The training consists of two parts:

- theoretical training,
- practical exercises.

Nuclear installation staff emergency training sessions are undertaken according to individual assignments in the form of lecture, showing, group seminars, practical demonstrations and practical training. A separate part consists of shift personnel emergency training sessions. At SE-EBO, shift exercises are held twice a year, area-wide emergency exercise one a year which is attended by all plant employees and co-ordination emergency exercise which is held in co-ordination with the region office, district office, CRA, ÚJD ERC or other ERO units (fire departments, health care, army, etc.) on a three-year basis. A co-ordination exercise with the presence ÚJD ERC, regional and district offices within a 30-km zone under threat took place most recently in October 2003.

Upon completion of exercises, their course is evaluated using observes and judges and measures are taken to improve the activity of the respective ERO units. These measures are subsequently controlled and the plant management deals with their fulfilment.

F. 5.7.1 Emergency preparedness facilities and means

These are created by the units referred to in F. 6.3 and supplemented with the following facilities:

- Backup emergency centre (BEC) serves as a backup workplace of ERO members for the case of an extremely unfavourable radiation situation. BEC is a newly-established centre at the external dosimetry premises.
- CP shelters are used for the initial shelter-taking of employees and intervention personnel and serve for issue of individual protection means (IPM) and special outfit for intervention units.
- CP assembly points serves for gathering staff and other individuals staying at SE-EBO. With its equipment they create conditions for short-term stay of employees when using IPM.
- In-house health centre (IHC) intended for the fundamental medical support, providing pre-medical and medical aid and preparation for transfer of afflicted persons to specialised health care facilities. Part of IHC is a decontamination node and workplaces for measuring person internal contamination.
- Communication facilities and equipment installed at SE-EBO:
  a) Slovak Telecom public telephone network,
  b) energy telephone network,
  c) mobile telephone sets of mobile operators networks,
  d) Motorola special-purpose radio network,
  e) paging network Multitone,
  f) in-house radio and operation (unit) radios.

These devices, measures and facilities are available at both SE EBO and SE EMO.

F.5.8 Interenational co-operation on emergency preparedness

F. 5.8.1 EU information system ECURIE

On 1 May 2004, the Slovak Republic became a European Union member state. This means that the Slovak Republic has to comply in the respective areas with EU regulations, directives and decisions. With respect to emergency preparedness this involves particularly Council Decision No. 87/600/EURATOM of 14 December 1987 on Community arrangements for the early exchange of information in the event of a radiological accident. Under this Decision a notification system ECURIE (European Community Urgent Radiological Information Exchange) has been created in the EU. On 1 May 2005, the Slovak Republic joined through ÚJD the system along with the other new member states. ÚJD is a liaison point in the system with a 24-hour permanent service. The liaison point for ECURIE is identical to that for the purposes of the IAEA Convention on Early Notification of a Nuclear Accident under F. 7.2. The ECURIE liaison point is backed up with a point of contact - MoI´s OCP. A national co-ordinator and his representative have been appointed for ECURIE.

F. 5.8.2 Conventions deposited by the International Atomic Energy Agency

The Slovak Republic is a signatory of international conventions on early notification of a nuclear accidents and on assistance in the case of a nuclear accident, thereby ensuring international co-operation in minimising possible consequences of a nuclear accident.

F. 5.8.3 Agreements and co-operation with neighbouring countries

The agreements lay down the form, method and scope of information to be provided to the parties in the case of an accident relating directly to nuclear installations or nuclear activities and specify co-ordinators of liaison points. The purpose of the above agreements is to contribute to minimising the risk and consequences of nuclear accidents and to create a framework for bilateral co-operation and exchange of information in areas of mutual interest in connection with peaceful uses of nuclear energy and protection from radiation. Bilateral agreements are concluded with both all the neighbouring states and other states.

F. 5.8.4 SR participation in international exercises

In 2002, two exercises took place on the international system RODOS in support for decision-making on real-time public protection measures with the aim of checking up modifications and practical utilisation of the system in the case of a nuclear or radiation accident. In May 2003, ÚJD organised and co-ordinated the internation exercise DSSNET (international system for decision-making support), where the 5th version of RODOS (software package for decision-making support) was used. Attended by a total of 23 countries and organisations, the exercise was organised and co-ordinated by ÚJD in co-operation with the Centre for Nuclear Research in Karlsruhe, Germany, and VÚJE Trnava, a. s. The scenario of the exercise was a simulated and modelled accident of a nuclear installation in the Slovak Republic´s territory. Another international exercise with the use of RODOS took place in August 2004. An international exercise aimed to verify the ENAC was held in February 2005. The co-ordinator of the exercise was the Vienna-based International Atomic Energy Agency. In May 2005, there was held the international exercise ConvEx 3 aimed at handling the consequences of a radioactive leak from the Cernavoda nuclear installation in Romania. In addition to Romania as the country hosting the event and Romania´s neighbouring states, 49 states from all over the world (among them the Slovak Republic as well) and 8 international organisations (the European Commission, FAO, the International Atomic Energy Agency, NATO, OECD/NEA, UNEP/OCHA, the International Health Organisation and the International Meteorological Organisation) took part in the exercise.

F.6. Decommissioning

For description of the decommissioning principles see the 2003 National Report.

G. Safety of Spent Fuel Management

G.1. General safety aspects

The General aspects of spent fuel management are described in Chapter F.
The requirements for nuclear safety of nuclear installations must be complied with at the stages of their siting, design, construction, commissioning, operation and decommissioning. Nuclear safety in siting, design, construction, commissioning, operation and decommissioning is conditional on meeting the general requirements for nuclear installations, special requirements for nuclear installations featuring a nuclear reactor and special requirements for nuclear installations for treatment, conditioning or storage of spent fuel.
Safety of spent fuel management is paid proper priority in all of the above stages.
Spent fuel that was irradiated in the reactor is the source of radioactive radiation and contains fission products which must be separated from the environment.

Spent fuel must be managed so as to:

- maintain subcriticality
- ensure after-heat removal
- minimise the effects of ionising radiation on operating personnel, the public and the environment
- have regard for the properties affecting nuclear safety such as toxicity, flammability, explosiveness and other dangerous properties.

The operator documents the provision for these requirements in the terms of reference safety report and in safety reports submitted prior to the construction and commissioning of NI. During operation periodic check-ups are carried out in order to ensure that the physical state and operation of NI is constantly in line with the design and applicable safety requirements. NI operators have a quality assurance system in place covering all activities relevant to safety. Following safety analyses, tests and operating experience, NI operators have defined limits and conditions that are strictly controlled during operation for compliance. Written procedures are developed to handle or mitigate the consequences of predictable events and accidents. The application of the “in-dept protection“ principle also makes for the prevention of events and accidents relevant to safety.
For ÚJD inventory see Annex III.

Minimising RAW production in spent fuel management

For description see the 2003 National Report.

G.1.1 Control for assessment of safety of existing facilities

- For the list and description of spent fuel management facilities see D.1. NS of April 2003
- For assessment of safety of spent fuel management facilities see G.4 NS of April 2003

G.2. Siting of installations

G.2.1 Legislation on siting

The siting of a nuclear installation takes ÚJD SR´s approval under Act No. 541/2004 on peaceful uses of nuclear energy.
ÚJD SR will decide on siting the construction of a nuclear installation following written application supported with specified documentation and the European Commission´s statement under the following:

- Article 41 of the Treaty establishing the European Community for Atomic Energy
- Council Regulation (Euroatom) No. 2587/1999 of 2 December 1999
- Commission Regulation (EC) No. 1209/2000 of 8 June 2000.

ÚJD SR will issue an opinion following application under Act No. 127/1994 Coll. on environmental impact assessment, as amended, and Act No. 50/1976 Coll., as amended, to assess both environmental impacts of the nuclear installation and potential impact of the environmnent on nuclear installations.

G.2.2 Siting of spent fuel management installations

For description see the 2003 National Report.

G.3. Designing and construction

G.3.1 Designing and construction legislation

Arts. 43 to 85 of Act No. 50/1976 Coll., as amended, and Act No. 541/2004 Coll. apply to building permission proceedings for nuclear installation constructions. The construction of a nuclear installation can only be undertaken by the holder of a valid building permission. ÚJD SR will decide on issue of a building permission to construct a nuclear installation in accordance with Art. 66 of Act No. 50/1976 Coll. Act No. 44/1988 Coll. on the protection and use of mineral resources applies to nuclear installation constructions involving a special intervention in the earth crust such as underground repositories.
Building structures, technological systems and components important to nuclear safety of the nuclear power facility shall be designed, manufactured, assembled, and tested in a way so as their reliable function be ensured. Manufacturers and suppliers of the classified components (components important in terms of nuclear safety), materials and accessories are obliged to present results of manufacture quality checks and tests of properties of components, systems, base material, welded joints and weld deposits, material properties and composition, as well as findings and defects rectified by the inspection, in the supply quality documentation. In cases when special technological procedures may influence resulting properties of materials and products used, performance of additional tests must be ensured in advance (e. g. keeping samples).
Control systems must allow for monitoring, measurement, registration, and control of values and systems important in terms of nuclear safety. Instrumentation and controls shall be designed and arranged in a way so that attending personnel had enough information on operation of the nuclear power facility at any time. The control room shall allow for a safe and reliable control of the operation. The human factor is considered only in relation to activities off the nuclear power facility.

G.4. Safety assessment of components

G.4.1 General principles of safety assessment

The basic requirements for nuclear safety and safety assessment are laid down by Art. 23 of Act No. 541/2004 Coll. During operation or decommissioning of a nuclear installation the licensee is obliged to carry out periodic, complex and systematic assessment of nuclear safety with due regard to the current state of knowledge on nuclear safety assessment and take action to remedy shortcomings found. The license holder is obliged to carry out periodic nuclear safety assessment at the intervals and to the extent established by a binding legal regulation issued by ÚJD SR:

For description see the 2003 National Report.

G.4.2 Safety assessment of SF management system and component operation

For description see the 2003 National Report..

G.4.3 International expert missions on spent fuel management

For description see the 2003 National Report.

In addition the following missions took place:

- A WANO mission held 7-25 October 2002 was focused on the verification of NPP Mochovce operation, preparation and maintenance. A final report was prepared assessing best practices and areas of imnprovement of utility activity that will manifest themselves in improved values for WANO operation indicators. The mission conclusions are used to improve NPP Mochovce operation indicators.
- A follow-up WANO review took place 21-25 June 2004 with its focus on control activities of tasks resulting from the previous peer review of 2002. The final report assessment stated that the NPP Mochovce complied with the world´s standards in two out of 16 reviewed areas.

G.5. Operation

G.5.1 Commissioning

For description see the 2003 National Report.

G.5.2 Legislation in operatiom area

The requirements for commissioning and operation of nuclear installations are laid down in Art. 19 of Act No. 541/2004 Coll. The spent fuel management requirements are set forth in Art. 21 of Act No. 541/2004 Coll. Furthermore, the Act lays down the requirements for nuclear safety, professional competence, quality assurance, physical protection, operational events, emergency preparedness.

A license to commission and operate a nuclear installation will be issued by ÚJD SR upon submission of a written application supported with documents like:

- limits and conditions for safe operation
- list of classified equipment divided into safety classes
- programs for testing classified installations established by the authority
- phased program for commissioning a nuclear installation
- program for in-service checks of classified installations
- quality system documentation and quality requirements for a nuclear installation and evaluation thereof
- operating procedures established by ÚJD SR
- on site emergency plan
- pre-operational safety analysis report
- for nuclear installations featuring a nuclear reactor, probability assessment of operation safety for a shutdown reactor and for low power levels as well as reactor full power
- physical protection plan including a contract with the Police Corps
- plan for management of radioactive wastes and spent fuel including transport thereof
- conceptual plan for decommissioning a nuclear installation
- document on financial coverage of nuclear damage liability except for repository
- staff training system
- programs for training select employees
- programs for training professionally competent employees
- documents on meeting qualification requirements of select employees and professionally competent employees
- documents on the preparedness of a nuclear installation for commissioning, trial operation, a report on evaluation of commissioning and for permanent operation a report on evaluation of trial operation
- regional public protection plan in the area under threat
- definition of the boundaries of a nuclear installation
- definition of the size of the area endangered by a nuclear installation, etc.

The operator's activities are governed by IAEA safety standards, such as SC 50-C-O „Nuclear power plant operational safety", SC 50-C-QA „Quality assurance at nuclear power plants", and related guides and the regulations SS No. 111-F „The principles of Radioactive Waste Management", SS 11-S-2 „Establishing a National system for Radioactive Waste Management", SS 111-G1.1 „Classification of Radioactive Waste".
The nuclear safety concept of nuclear power plants is based on the „defence-in-depth strategy", which is generally used all over the world during nuclear power plant designing and operation. When evaluating the safety, ÚJD SR assesses the plant's ability to fulfil safety functions in accordance with the design so that required "defence-in-depth" is ensured.

G.5.3 Limits and conditions for SF management

Limits and conditions of a safe operation is the basic documents used at a nuclear power plant. The regulation has been developed based on ÚJD SR requirements, according to the Act No. 541/2004 Coll. for ensuring nuclear safety, where the constructor company shall:
Submit the L&C proposal prior to issuance of ÚJD SR approval for a NI construction
Ensure approval of the L&C by ÚJD SR in the stage of a NI commissioning
Meet L&C, while ÚJD SR is in charge of inspecting the adherence.

For description of limits and conditions see the 2003 National Report.

In 2004-2005, L&C conversion according to NUREG 1431has been under way at EMO.

G.5.4 Regulatory and working documentation for NFC operation, maintenance and care about transportation equipment

For description see the 2003 National Report. Since the last (2003) National Report the following documents have been introduced:

- PP T-101 Operation of C-30 transport container during spent fuel transport
- PP T-103 Manipulator MAPP – 400
- PP T-107 Carriage of spent fuel from WWER–440 units to MSVP, spent fuel storage and handling prior to carriage for reprocessing

G.5.5 Operation technical support

For description see the 2003 National Report.

G.5.6 Analysis of operating events

Article 27 of the Act No. 541/2004 Colldefines operating event categories (failures, accidents, accodents), the operator's notification obligations toward ÚJD SR, requirements for ascertaining causes of operating events and keeping the public informed. The requirements of the above Act are elaborated in internal documentation of SE-EBO, SE-EMO and SE-VYZ. Internal documentation elaborates in addition to the Act also IAEA and WANO expectations on feedback from events.
Any operating event is registered and systematically assessed. The whole process involving an analysis of operating events, their reporting to ÚJD SR and archiving is carried out and co-ordinated by the Feedback Group (FBG) of the nuclear safety departments of the respective installation.The analysis results are approved and corrective action to remedy the root causes of the events to prevent them from recurring are established at the meetings of the commission on handling operating events, whose members include safety department and operation and maintenance unit heads.
Under the proactive approach aimed at avoiding the occurrence of operating events, the operators have elaborated a system of dealing with near-events and events without consequences. In 2004, SE-EMO and SE-EBO started off co-operation with DTI UK project "Improvement of safe operation and safety culture by applying the near-event concept (NSP/03-S10)". The project will be completed in 2005 and its expected output will be further improvement of handling near-events.
Yet another proactive approach is to make use of experience from operating events of other nuclear

installations, in particular from WANO and IAEA databases. The operators have developed procedures and criteria under which they assess the applicability of lessons learnt from the events at other nuclearinstalaltions. The result of this assessment is to take preventive action to prevent the occurrence of suchlike (similar) events.
Feedback staff are trained on a regular basis on methodologies to investigate event root causes (e.g. IAEA and WANO workshops) and they are also regulars in international review groups (MAAE - OSART, WANO - Peer Review), which also goes a way toward consistence of the procedures applied by the power plants on feedback with international standards and procedures.
The effectiveness of handling operating events is annually assessed in the annual reports on operating events and in reports on the state of nuclear safety and reliability. The results of these assessments initiates changes in organisational structure in particular aimed to improve continuously the process of feedback from operating events. The process effectiveness is also evaluated by external organisations, e.g. a WANO peer review was conducted at SE-EMO in 2002 involving also a review of the feedback system.

G.6. Spent fuel disposal

For the spent fuel repository development process by 2002 see the 2003 National Report.
During 2003-2004, the Slovak Republic became involved also in international IAEA-backed activities concerning the research of geologic environment suitability for a deep repository in the form of implementing a national technical co-operation project (TCP SLR/4/009 - Phase 2 is scheduled for 2005-2006) and an interregional technical co-operation project (INT/9/173). This international co-operation allows for exchange of experience and knowledge at international level, getting involved expert teams dealing with the given issues. Making use of the experience of the countries having a more developed deep repository program serves to improve the effectiveness and safety of the national tackling of the problem of final disposal for spent fuel and high-level radioactive wastes.

H. Safety of RAW management

H.1. General safety requirements

The general safety requirements are described in Chapter F.
Nuclear safety in siting, design, construction, commissioning, operation, decommissioning and in the case of repository also in closure thereof is conditional on meeting the general requirements for nuclear installations, some special requirements for nuclear installations with nuclear reactor and special requirements for nuclear installations for treatment, conditioning or storage of RAW.
The general safety requirements during RAW management are based on afore mentioned legal requirements, taking account of RAW specifics.

The safety of management of radioactive waste prior to their acceptance to the repository is the responsibility of the radioactive waste generator.
RAW must be managed so as to:
a) maintain subcriticality,
b) ensure residual heat removal,
c) minimise the effects of ionising radiation on operating personnel, the public and the environment,
d) having regard for the properties affecting nuclear safety such as toxicity, flammability, explosiveness and other dangerous properties.

The generation of radioactive waste and management of radioactive waste must follow technical organisational measures so that their quantities and activity are kept as low as reasonably achievable.
The conditioning of radioactive waste is activities leading to a form fit for its shipment and disposal or for its storage.
All activities in managing radioactive waste must be directed to its safe disposal.
For RAW inventory see Annex IV.

H.1.1 RAW generation minimisation program

The requirements for minimising RAW generation are set out in Act No. 541/2004 Coll.

The minimisation system is elaborated at SE-EBO and SE-EMO in directive RW-04 “RAW generation minimisation“ and document QA14-03 “Radioactive generation minimisation“, respectively.
SE-EBO has developed Programs for minimising RAW generation for the period 2001-2005, for NPPs V-1 and V-2. The fulfilment of programs is controlled in a “Report on management of RAW at SE EBO“. The report proposes new measures how to minimise RAW generation for the next period and they fulfilment is evaluated.
Following measures have been implemented:

- commissioning of fragmentation facility,
- improving of storage tank integrity,
- liquid radwaste evaporator reconstruction,
- sludge removal from the special washing facility.

In 2003, SE-EBO started implementation procedure for releasing material into the environment in compliance with technical report No. EBO-MER/TS/01-0/02 “Draft procedure for measurement of low-contaminated materials from V-1, V-2 operation and release of them into the environment“ and technical report No. 0-MTD-009 “Methodology for release of low-contaminated materials into the environment from V-1, V-2 operation“. Pursuant to Regulation No. 12/2001, authorisation for release of afore mentioned materials into the environment was issued by Public Health Authority of SR.
Until 2002, RAW from SE-EMO operation had been released under prepared and approved procedures (“piece-by-piece“ measurement of wastes). Since 2002 to 2004, release of material from SE EMO operation was interrupted. e. In 2004, SE-EMO developed legislation and measuring methodologies for release of material from its operation. Pursuant to Act No. 470/2000 Coll. on human health protection, Art. 17, “SE-EMO in 2004 submitted to State Health Authority of SR application for a license for release of material. The Public Health Authority approved that application and in late 2004 and early 2005, SE EMO succeed release considerable amount of controlled material.

H.1.2 Interdependencies between RAW management steps

In 2003 was issued a “Generic catalogue of radioactive wastefor its processing at SE-VYZ“ that provides basic requirements for waste acceptance at SE-VYZ treatment and conditioning facilities. This document also defines the principles for receiving and delivering of waste and conditions for making a product that meets criteria for disposal at the Mochovce and for RAW shipment.
For further details see the 2003 National Report.

H.1.3 Provision for efficient protection of individuals, society and the environment

For description see the 2003 National Report.

H.1.4 Biologic, chemical and other risks

For description see the 2003 National Report.

H.1.5 Limitation on undue burders on future generations and their unacceptable impact

For description see the 2003 National Report.

H.2. Existing facilities and past practices

For description see the 2003 National Report.

H.3. Siting of proposed installations

H.3.1 Legislative requirements

For description see the 2003 National Report.

H.3.2 Siting of individual nuclear installations

For description see the 2003 National Report.

H.4 Design and construction of installations

H.4.1 Legislative requirements

The building authorization procedure is described in Chapter E.2. in accordance with the requirements of Civil Construction Act and Atomic Act. The Authority shall decide on the issuance of building authorization for the construction of nuclear installation based on written application for building authorization of the constructor with the documentation required by the Civil Construction Act and the following documentation:

I. preliminary safety report demonstrating compliance with statutory requirements for nuclear safety based on the data envisaged in the project,
II. design documentation necessary for the building authorization proceedings,
III. preliminary plan for management of radioactive wastes, spent fuel including shipment thereof,
IV. preliminary conceptual plan for decommissioning,
V. categorisation of classified equipment into safety classes,
VI. preliminary plan for physical protection,
VII. quality system documentation and nuclear installation quality requirements and evaluation thereof,
VIII. preliminary on-site emergency plan,
IX. preliminary limits and conditions for safe operation,
X. preliminary program for controls of a nuclear installation prior to its operation,
XI. preliminary definition of nuclear installation boundaries,
XII. preliminary definition of the emergency planning zone with a nuclear installation.

Minimization of radiological impact is established in the Act No. 272/1994 Coll. and is proved by documentation submitted according to amendment of this act from the year 2000 (see E.3.2). Proposal of limits and conditions contains justification of discharge limits.

Preliminary conceptual plan for decommissioning as part of the documentation submitted prior to the construction is required by the Atomic Act and contains description and reasoning of the method of decommissioning, technical solution to decommissioning with at least two options and a recommendation of selected option.

H.5. Assessment of safety of installations

H.5.1 Assessment of safety prior to construction

The assessment of safety of NI prior to their construction is based on review and approval of safety documentation (see H 4.1.). The requirements for occupational health and safety and safety of technical equipment are dealt with in the regulations set out in E 2.3.

H.5.2 Assessment of safety prior to and during operation

For description see the 2003 National Report.

H.6. Operation of installations

H.6.1 Commissioning and operation of installations

A license for commissioning and operation of a nuclear installation is issued by ÚJD in accordance with Atomic Act., following the submission of written applicationsupported with the following documentation:

1. limits and conditions for safe operation,
2. list of classified equipment divided into safety classes,
3. programs for testing of classified equipment established by the authority,
4. phased program for commissioning a nuclear installation,
5. program for in-service inspections of classified equipment,
6. quality system documentation and quality requirements for a nuclear installation and evaluation thereof,
7. operating procedures established by ÚJD SR,
8. on-site emergency plan,
9. pre-operational safety analysis report,
10. physical protection plan including a contract with the Police Corps as well as description of aviation activities at nuclear installation premises and in their immediate vicinity,
11. plan for management of radioactive wastes and spent fuel including shipment thereof
12. conceptual plan for decommissioning a nuclear installation,
13. document on financial coverage of nuclear damage liability except for repository,
14. system of professional training of employees,
15. programs for training of licensed employees,
16. programs for training professionally qualified employees,
17. documents on meeting qualification requirements of licensed employees and professionally qualified employees,
18. documents on the preparedness of a nuclear installation for commissioning; trial operation and for permanent operation,
19. off-site emergency plan,
20. definition of the boundaries of a nuclear installation,
21. definition of the emergency planning zone,
22. documentation pursuant to the Civil Construction Act.

For further data see the 2003 National Report.

H.6.2 Limits and conditions

For the description and methodology for development of limits and conditions see the 2003 National Report.

H.6.3 Working procedures

For description see the 2003 National Report.

H.6.4 Engineering and technical support

For description see the 2003 National Report.

H.6.5 Waste characterisation and sorting procedures

See H.1.2 and the 2003 National Report.

H.6.6 Event reporting system

The system for reporting failures to the regulatory authority is the same for all the nuclear installations (see G.5.6).

H.6.7 Conceptual decommissioning plans

The conceptual decommissioning plans are part of the documentation submitted before commissioning NI, specifying preliminary conceptual decommissioning plans (see H 4.1). Conceptual decommissioning plans document the state of NI structures upon completion of operation and contain decommissioning goals and procedure including estimated financial demands, description of the expected radiation situation and quantities and activity of radioactive waste, set out requirements for capacity of radwaste management installations and for collection and archiving of operational data relevant to decommissioning planning.
Conceptual decommissioning plans are updated on a ten-year basis.

H.7. Institutional measures after closure of repository

H.7.1 Record keeping

All information on disposed radioactive waste including the location of containers, quantities and activity of radioactive waste, specifications of their properties, composition of the respective waste packages is kept during operation in accordance with the operator's procedures. The scope of records will be specified by ÚJD in the repository closure authorization conditions.
After closure of repository, its current operator will make sure that information on disposed containers is transferred for archiving with such institution as designated by the state for the performance of institutional control. The repository closure and institutional control plan as one of the basic documents necessary for ÚJD SR to issue the authorization to close the repository contains, inter alia, the method of long-term archiving and transmission of information, determining media to be used and data relevant to taking corrective action or reassessing the repository safety in the future and the way of keeping records of results of controls, measurements and monitoring during the institutional control. Additionally, the basic information on the existence of disposed containers will be created in-situ in order to prevent as safely and long as possible undesirable activities that might be pursued by man in the given area. In accordance with pre-operational safety analysis report, one of the considered solution is realization of pyramidal object from reinforced concrete out of the disposal site, which has warning as well as informative function (presentation of basic data about the repository). The parallel solution is of course state archiving of information related to the repository.

H.7.2 Institutional control

Under the term institutional control we understand all activities, performed after the end of disposal of RAW and repository closure. Monitoring systems will be in operation, which will provide information about possible water penetration into disposal vaults and its further migration. Necessary maintenance of the repository structures will be ensured, and the system of physical protection of repository will be in operation during active period of institutional control.

Duration of institutional controlis influenced by various factors and aspects in mutual interaction, which must be respected at the determination of institutional control duration. The most important from them are the results of safety analyses, which by determination of the most critical scenarios of possible contact of RAW with public, specify total and concentration activity limits of disposed RAW and provide the basic presumptions for considerations about determination of the duration of institutional control.
The basic purpose of institutional control is to avoid access of unauthorized persons to the site of repository and control its main parameters during the time, after which it will be possible to release

the area for unlimited use. The precise scope of institutional control will be established following safety analyses prior to the closure of the repository.
On the basis of results of safety analysis and in accordance with recommendation of international mission WATRP, the 300 years duration of institutional control is assumed for NRR Mochovce and for intruder scenarios is considered, that system of final repository cover will prevent the access close to disposed RAW for a period of 500 years.

Also part of the repository closure and institutional control plan is the plan for maintenance of and repair to the respective components of the repository over the period of active part of institutional control as well as establishing the scope of activities to be carried out within passive part of institutional control of the repository.
The **current pre-operation safety analysis report (PoSAR)** sets out the above basic information on the operator including the organisational structure, specifies the construction in question (purpose and scope) and furnishes the basic information whereby the operator documents its organisational and technical preparedness to operate the radwaste repository as well as the current solution to financial coverage of activities relating to the repository. PoSAR documents that both during operation and over the institutional control period individuals, society and the environment are protected from radiation events. PoSAR guarantees that the criteria set out for the repository by MoH will not be exceeded as long as the limits set forth therein are complied with:

1. effective dose to a member of the public due to the evolution scenario (scenarios with a probability that will approach 1 over time) shall not exceed 0.1 mSv/y in any year following the completion of institutional control of the repository;
2. effective dose to a member of the public due to a intrusion activity (scenarios where a probability will substantially be less than 1) shall not exceed 1 mSv/y in any year following the completion of institutional control of the repository.

It contains the following sections dealing with safety assessment for periods subsequent to the closure of the repository:

a) Repository closure and institutional control plan (at the level of design study)
   - Stabilisation of the site
   - Completion of repository operation
   - Post-operation monitoring

b) Safety analyses
   - Characteristics of disposed waste
   - Safety aspects of repository operation
   - Long-term stability
   - Long-term repository safety analyses
   - Waste acceptance criteria for disposal resulting safety analyses

The Mochovce NRR´s long-term safety analyses envisaged two groups of scenarios - evolution and intrusion.

- *Evolutional scenario* describes normal repository development, expecting a gradual loss of the functionality of engineering barriers due to natural degradation, subsequent leaching of radionuclides, passage through clay seal into the saturated layer, transport through groundwater and their transport into the biosphere by all possible pathway to human (e.g. irrigation, drinking water preparation, etc.). The analyses under this scenario rests in setting up mathematical models for the respective stages of transport of radionuclides from their release from the repository to their spread in the biosphere. As a result of the repository evolutional development was establishment of the overall inventory of radionuclides which can be disposed of in the repository so as to comply with the evolutional scenario limit value.
- *Intrusion scenario* is based on the assumption upon expiry of institutional control at which time the location will be released for unlimited use such activities might occur at the repository as the construction of roads or buildings, permanent residence at the site (without knowing that there is radioactive waste disposed of). These scenarios are crucial for the derivation of concentration limits for specific radionucludes in the waste to be disposed of. As the degree of intrusion of RAW disposed of is different for the respective scenarios, the concentration limit of the medium/lower layer was determined by the scenario for the construction of a multi-storeyed building and the limits for the upper layer of containers depending on radionuclide were calculated from the resident and construction scenarios.

H.7.3 Intervention measures

It is assumed that intervention measures will be performed in the case of detection of unplanned release of radioactive materials in drainage system of the repository or in some part of the environment in the vicinity of the repository, if any.
Pursuant to the Atomic Act, the holder of the authorization for repository closure and institutional control will provide the performance of such corrective intervention. The scope of corrective action is not established precisely as yet, depending on the results of controls and measurements carried out during the institutional control, on the results of the program for monitoring the state of repository barriers and the radiological monitoring plan. Afore-mentioned controls, measurements, monitoring programs are designed so as to cover all potential pathsways for leakage and spread of radionuclides from the repository into the environment.

I. Transboundary Movement of SF and RAW

I.1. General requirements for safety at borders

Transboundary shipment of SF and RAW, imports, exports are governed by Act No. 541/2004 Coll. and by the upcoming Decree which is based on IAEA recommendations formulated in the documents series TS-R-1. A decision on approval of type of transport equipment is issued for up to five years. All transboundary shipments of spent fuel have been carried out under authorisations and permits of regulatory and administrative authorities of the state of origin following notice of the state of destination and its approval.

I.1.1 Basic requirements for safety documentation

Safety documentation shall contain a set of measures for efficient protection of persons, property and the environment from the consequences of radiation exposure during the shipment of radioactive materials. This protection is secured by isolation of radioactive contents from the environment, by checking dose rates during shipment, by preventing the criticality from being achieved and by preventing damage to the shipment due to heat being released and absorbed.

These measures must apply to all activities and states associated with the movement of *radioactive materials*; they include the design, maintenance of and repair to *transport equipment* and preparation, loading, carriage including storage during transport, unloading and acceptance of consignment at the point of destination.

I.1.2 Issue of a shipment authorization

The Authority issues an authorization for shipment radioactive material and approval of the type of transport equipment (shipment project approval) in the form of a decision.
In the decision whereby an authorization for shipment radioactive material is issued by the Authority, shall indicate (in addition to common elements):

a) the type of the authorization,
b) the identification number assigned by the Authority,
c) the date of issue and validity,
d) the list of relevant Slovak and international regulations, including issue of the International Atomic Energy Agency's Regulations for the Safe Shipment of Radioactive Materials under which the shipment is authorized,
e) restrictions on the mode of carriage, the type of the transport equipment, shipping container, and possible instructions on the transport route,
f) the following statement:
"This permit shall not relieve the consignor from the obligation to comply with the requirements under legal rules of the states to or through which the shipment is to be effected",

g) detailed list of additional operational checks necessary in the preparation, loading, carriage, storage, unloading and handling of the consignment, including possible special provisions concerning storage in terms of safe heat removal and subcriticality assurance,
h) reference to information furnished by the applicant relating to special acts to be carried out prior to the shipment,
i) reference to the appropriate approval of the transport equipment or the shipment project,
j) specifications of the current radioactive content which may not be obvious from the nature of the package system; this shall include the physical and chemical form, the total activity (or activities of various radionuclides), the amount of a possible fissile material in grams, and the notice as to whether the material to be transported is not a low dispersed radioactive material,
k) specification of the appropriate quality assurance program.

The Authority may also impose other such measures, as it thinks necessary.

In the decision whereby the Authority issues a authorization for shipment radioactive materials under special arrangements, shall indicate (in addition to common elements):

a) the type of the authorization,
b) the identification number assigned by the Authority,
c) the date of issue and validity,
d) the mode(s) of carriage,
e) restrictions on the mode of carriage, the type of the transport equipment, the shipping container, and possible instructions relating to the transport route,
f) the list of relevant Slovak and international regulations, including issue of the International Atomic Energy Agency's, Regulations for the Safe Shipment of Radioactive Materials under which the shipment is authorized,
g) the following statement:
"This permit shall not relieve the consignor from the obligation to comply with the requirements under legal rules of the states to or through which the shipment is to be effected",
h) reference to the authorization for alternative radioactive content, to the validation of authorisations from other competent authorities or to additional technical data or information at the Authority's opinion,
i) description of the package system by making a reference to drawings or project specifications. If it proves appropriate, also a reproducible illustration, sized no more than 21 x 30 cm, showing the shipment together with its very brief description, including the structural material, total weight, outer external dimensions, and appearance,
j) brief specification of the authorised radioactive content, including possible restrictions on radioactive content, which may not be obvious from the nature of the package system. This shall include the physical and chemical form, the total activity (or activities of various radionuclides), the amount of a possible fissile material in grams, and the notice as to whether the material to be transported is not a low dispersed radioactive material,
k) additionally, for fissile material shipments:
    1. detailed description of the authorised radioactive content,
    2. subcriticality index (SCI),
    3. reference to the documents demonstrating the content subcriticality,
    4. other special circumstances the absence of water at certain free spaces in assessing the subcriticality,
    5. any assumptions under which a reduction in the neutron multiplication is assumed as the result of the actual course of radiation exposure,
    6. the range of ambient temperatures for which the authorisation for the transport under special conditions has been issued,
l) the detailed list of additional operating checks required in the preparation, loading, carriage, unloading and handling of the consignment, including possible special provisions concerning storage in terms of safe heat removal,
m) the reasons for shipment under special arrangements (as appropriate/necessary),
n) description of compensation measures to be used if the shipment will be carried out under special arrangements,
o) reference to information provided by the applicant relating to the used of the packaging or specific actions to be taken prior to the shipment,
p) the statement regarding the ambient conditions assumed for purposes of design ,
q) specification of the appropriate quality assurance program,
r) reference to the carrier identity, as necessary.

The Authority may also impose other measures, as it thinks necessary.

I.1.3 Approval of the type of transport equipment

In the decision whereby the Authority approves the type of transport equipment shall set out (in addition to common elements):

a) the type of the approval certificate,
b) the identification designation assigned by the Authority,
c) the date of issue and validity,
d) possible restrictions on the mode of carriage,
e) the list of relevant Slovak and international regulations, including issue of the International Atomic Energy Agency's Regulations for the Safe Shipment of Radioactive Materials under which the type of transport equipment/shipment project has been approved,
f) the following statement:
"This approval shall not relieve the consignor from the obligation to comply with the requirements under legal rules of the states to or through which the shipment is to be effected",
g) reference to the authorisation for alternative radioactive contents, to the validation of approval from other competent authorities or to additional technical data or information at the Authority's opinion,
h) the statement on shipment authorization, if the shipment authorization and the transport equipment approval are combined in the same decision,
i) package system identification,
j) description of the package system by making a reference to drawings or project specifications. If it proves appropriate, also a reproducible illustration, sized no more than 21 x 30 cm, showing the shipment together with its very brief description, including the structural material used, total weight, overall outer dimensions, and appearance,
k) specification of the package projects with a reference to drawings,
l) specification of the authorised radioactive content, including possible restrictions on radioactive content which may not be obvious from the nature of the package system. This shall include the physical and chemical form, the total activity (or activities of various radionuclides), the amount of a possible fissile material in grams, and the notice as to whether the material to be transported is not a low dispersed radioactive material,
m) additionally for fissile material shipments:
    1. detailed description of the authorised radioactive content,
    2. subcriticality index (SCI),
    3. reference to the documents demonstrating the content subcriticality,
    4. other special circumstances the absence of water at certain free spaces in assessing the subcriticality,
    5. any assumptions under which a reduction in the neutron multiplication is assumed as the result of the actual course of radiation exposure,
    6. the range of ambient temperatures for which the approval for the transport equipment under special arrangements has been issued,
n) for B(M) packages, explaining information as may be of benefit to other competent authorities,
o) the detailed list of additional operating checks required in the preparation, loading, storage, unloading and handling of the consignment, including possible special provisions concerning storage in terms of safe heat removal,
p) reference to information provided by the applicant relating to the used of the packagingor specific actions to be taken prior to the shipment,
q) the statement concerning ambient conditions assumed for the packaging design,
r) specification of the appropriate quality assurance program,
s) reference to the carrier identity, as necessary.

The Authority can subject the decision on approval to conditions it considers necessary.

I.2. Experience with RAW transboundary shipment

Atomic Act No. 541/2004 Coll. allows for import of RAW that came into being by treatment and conditioning of RAW exported to this end and their re-import was approved in advance by ÚJD SR and it also allows for import of RAW for the purpose of their treatment and conditioning on SR territory if export of RAW with an aliquot activity was agreed by contract and authorised by ÚJD SR. Any other import of RAW to SR territory is prohibited. The Atomic Act precisely specifies in Art. 3 (8) states to which it is prohibited to ship RAW.

The RAW transboundary shipment process is governed by Art. 16 of the Act, implementing Council Directive No. 92/3/EURATOM on shipments of radioactive waste between Member States and into and out of the Community.

Neiher RAW shipments across SR territory, nor RAW imports or exports have been carried out since the Atomic Act came into force.

J. Disused Sealed Sources

No sealed sources are manufactured in the Slovak Republic, and according to the data available no manufacture is under preparation, either. All the radioactive sources in use are imported to the Slovak Republic from Germany, the United Kingdom, the Russian Federation, Poland, and the Czech Republic.

Roughly 1,300 sealed radioactive sources are currently used in the Slovak Republic. The number does not include Am-241 sealed radioactive sources applied in the fire detectors. A further 1200 sealed radioactive sources are currently not used and are stored by respective users. Captured and orphan sources are temporarily stored within the “hot chamber” at Huma-Lab Apeko, s. r. o., Košice. Disused sealed sources that comply with the conditions for disposability pursuant to L&C are treated along with RAW from nuclear installation operation and subsequently disposed of at the Mochovce Near Surface Repository. Other DSS are long-term stored at SE-VYZ certified storage facilities.

Act No. 272/1994 Coll. on public health, as amended established the fundamental legislative requirements for the use of sealed radioactive sources.

This act lays down the basic principles for radiation protection, the criteria for classification of radiation sources into 6 categories, the basic conditions and requirements for the use of radioactive sources, dose limits, requirements on management of institutional radioactive waste, requirements on release of material into the environment, and defines the basic obligations of radioactive source users. Moreover, the Act sets out the rights and obligations of the Ministry of Health in providing radiation protection, competences of regulatory bodies (Chief Hygienist of the Slovak Republic, state regional hygienist) and regulatory workplaces (Public Health Authority of SR and regional public health care authorities).

The “Central register of ionising radiation in the Slovak Republic“ was established under an amendment to Act of the NC SR No. 272/1994 Coll. on human health protection, and the State Faculty Health Institute of the Slovak Republic in Bratislava was designated for its administration.

The Slovak Health Ministry’s Regulation No. 12/2001 Coll. on radiation protection requirements specifies requirements in terms of optimisation of radiation protection and management of disused sealed sources. The Regulation further defines the requirements for “restricted areas“,monitoring of workplaces, and emergency procedures.

Act No. 541/2004 Coll. on peaceful use of nuclear energy defines institutional radioactive waste and delegates to ÚJD the responsibility for the supervision over activities related to its conditioning and disposal of. Related ÚJD SR Regulation specifies requirements for performance of these activities.

Act No. 254/1994 Coll. on the State Fund for Decommissioning of Nuclear Installations and Management of Spent Fuel and Radioactive Waste defines, inter alia, the procedure for financial compensation of costs associated with management of captured DSS or DSS whose originator is unknown.

For further details see the National Report of SR on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

K. Planned Activities to Improve Safety

K.1. Evaluation of the safety improvement measures contained in the 2003 National Report

- construction of a transport route for shipment of solid RAW from the NPP V2 will contribute to reducing the personal dose to RAW service employees and to reduction of time for RAW direct handling, while at the same time increasing the solid RAW transport safety;
  Fulfilment: The solid RAW transport route was constructed and put into use in 2003.

- put into operation of a storage facility for contaminated oil substances at V2 premises will enhance fire safety in management of radioactive oil substances as the construction project did not taken into account generation of contaminated oil substances and no suitable storage facility for oil substances was available;
  Fulfilment: The storage facility for contaminated oil substances was put into operation in 2005.

- Installation of ultrasound measurement of levels in liquid RAW storage tanks will enhance liquid RAW storage safety and reduce the radiation load of employees resulting from demanding maintenance of the original obsolete measuring system;
  Fulfilment: Level ultrasound measurements were realised in all liquid RAW storage tanks of V-1 and V-2 in 2003.

- Put into l operation with a metrological certificate measuring chamber of waste radionuclides at SE-EMO;
  Fulfilment: The spectrometric chamber is in operation. The accuracy of its measurement will be corrected annually by using sampling and performing of radio analyses at an accredited laboratory,

K.2. Planned measures to improve safety

Following measures are planned to improve safety:

- seismic upgrading of liquid RAW storage tanks (NPP V-2)
- installation of Fire Extinguisher Equipment in the solid RAW storage facility (NPP V-2)
- putting into operation a sorting carousel for measuring the dose rate of small solid contaminated material before their release into the environment (NPPs V-1, V-2)
- cleaning of reactor wessel and other internal surfaces of the primary circuit from mechanical impurities at every complete removal of fuel and reactor internals;
- start construction, commissioning and operation of a new facility dedicated for Treatment and Conditionong of liquid RAW from SE-EMO operation. The expected start of operation is the end of 2006;
- Minimization of amount of stored solid RAW by authorised realising of such materials into the environment.
- overall and contractual tests of the stand in the intermediate spent fuel storage facility are planned in 2005, normal operation of the stand for spent fuel inspections is expected since2007 onward.

L. Annexes

I. List of SF management nuclear facilities

II. List of RAW management nuclear facilities

III. List of nuclear facilities subject to decommissioning

IV. Inventory of stored SF (t_{HM})

V. Inventory of stored RAW

VI. List of selected national laws, Regulations and guides

VII. List of international expert reports (including safety analysis reports)

VIII. List of authors

Annex I. List of SF and RAW management nuclear facilities

1) Under Article 2 of the Convention, Slovenské elektrárne, a. s., is the operator of the following nuclear facilities within its subsidiaries:

   a) Atómové elektrárne Bohunice, subsidiary, SE-EBO: NPP V1 Units 1 and 2
      NPP V2 Units 3 and 4

   b) Atómové elektrárne Mochovce, subsidiary, SE-EMO EMO Units 1 and 2

   c) Decommissioning of the Nuclear Facilities, Radioactive Waste and Spent Fuel Management, subsidiary of SE, a. s., SE-VYZ:
      - Interim Spent fuel storage facility (ISFS)
      - RAW treatment and conditioning technologies
      - National radwaste repository

   d) VÚJE owns in the Jaslovské Bohunice site a RAW experimental incinerator and an experimental bituminization line, both out of operation.

II.4.2. List of facilities for RAW management during decommissioning

In the NPP A-1 decommissioning process following the processing of operation RAW, the original storage premises were reconstructed to the following extent:

- unit 44/20 storage volume 2,140 m^3 serves for temporary storage of solid RAW
- unit 41 tanks 5/1, 5/2 - 3 steel-made tanks with a capacity of 100 m^3 each were installed into the tanks. The total storage capacity of 600 m^3 is used in the process of treatment of low-contaminated waste waters produced from A-1 decommissioning and RAW treatment activities
- room No. 2, unit 34, storage capacity of 40 m^3 serves for storage of organic liquid RAW

Upon dismantling of NPP A-1 technologic equipment of the secondary circuit, intermediate engine room and sime of primary circuit equipment, storage premises for temporary storage of solid RAW were established with the following capacities:

room No. 1, unit 34 - 4,800 barrels
room No. 30/54, unit 32 - 3,724 MEVA barrels
room No. 97, unit 32 - 2,050 MEVA barrels
room No. 106, unit 32 - 1,480 MEVA barrels
room No. 702, unit 30 - 296 metallic patrons with vitrified RAW

Annex II. List of nuclear facilities subject to decommissioning

Under Article 2 of the Convention, Slovenské elektrárne, a. s., is the owner of the following nuclear facilities under decommissioning within its branch plant Decommissioning of the Nuclear Facilities, Radioactive Waste and spen Fuel Management, subsidiary of SE, a. s., SE-VYZ:
NPP A1 including equipment for management of RAW from this NPP.

Annex III. Inventory of stored SF (t HM)

The ISFS design capacity was 600 tonnes of heavy metal, i.e. 5,040 fuel assemblies. SF is stored in special containers. SF leaking fuel assemblies are put as soon as possible in hermetic cases. The ISFS third refurbishment has brought the storage capacity up to 14,112 SF assemblies.

The storage capacity of the V1 spent fuel pools is 1,000 fuel assemblies each at V1 and V2, 2,000 fuel assemblies at EMO. The Slovak Republic's total SF storage capacities are utilised up to 62%.

Annex IV. Inventory of disposed of and stored RAW

RAW disposed of at the Mochovce NRR

As of the end of 2004, a total of 794 FRC´s were disposed of, which represents 2,382 m^3 of conditioned RAW from the NPP A1, V1 and V2. The main part of the wastes were comprised of concentrates from the above NPP´s in the form of bituminized products and solid wastes from the NPP´s processed prior to FRC incorporation through high-pressure compaction.

RAW stored at SE, a. s., facilities

RAW stored at WWER-type NPP´s

Because of the original concept for RAW management focused on their conditioning and disposal only after NPP decommissioning, RAW had accumulated at storage premises. After building of both RAW treatment and conditioning technologies and the NRR, the amount of RAW stored began progressively falling.
RAW stored at WWER-type NPP´s is set out in points IV.1 - IV.3.

RAW stored at SE-VYZ facilities

Secondary RAW are currently generated at nuclear facilities being decommissioned (NPP A1) in connection with decontamination, dismantling and demolition works.

For historical reasons RAW from the NPP A1 Bohunice pose a special problem, since they had been neither consistently sorted nor recorded. Much of liquid operational RAW has already been treated and conditioned for disposal or the activity level of the wastes was reduced. Continuously formed concentrates (about 10 m^3 per year) are treated every year using bituminization.

Inventory of stored RAW at SE-VYZ premises is set out in point IV.4. RAW quantities treated and conditioned at RAW BCC are set out in IV.5.

IV.1. Inventory of stored RAW at NPP V1

IV.1.1. Utilised capacity of storage premises for SRAW (as of 30.6.2005)

Storage facility	Overall capacity /m^3/	Utilised capacity /m^3/	Available capacity /m^3/
Total	0	0	0

In 2003, storehouse SK 241 on unit 801 terrace was cleared and cleaned. The storehouse is currently used as a emty containers storehouse. Storage shaft SK036/1 was cleared in 2003 as well. The shaft serves for storage of barrels with high DP and of shielded barrels.

Storage of AC filters

Storage facility	Capacity /m^3/	Utilised capacity /m^3/	Free capacity /m^3/
Total	0	0	0

A total of 2,906 barrels were stored at the NPP V-1 as of 30 June, of which:

- 623 barrels of sorted combustible material NT-compacted using a spacer against expansion of the material stored,
- 1,940 barrels for sorting NT-compacted (of which 1,011 at V-2) intended for sorting,
- 38 barrels of sorted of combustible material stored in bulk,
- 170 barrels of sorted of combustible material packed in tatrafol,
- 56 barrels for HP compacting,
- 47 shielded barrels with high-activity RAW,
- 32 barrels with building debris intended for dying out and release into the environment.

IV.1.2 Utilised capacity of LRAW storage premises

Storage of ra-concentrate

Tank	Capacity [m^3]	Utilised capacity [m^3]	Volume converted in total salinity 190g/kg	Summary activity [kBq/l]	Free capacity [m^3]
Total	**0**	**2,695**	**2,879**	**-**	**1,520**

Storage of low level and medium level sorbents

Tank	Capacity [m^3]	Utilised capacity [m^3]	Free capacity [m^3]
ZT20N-1	428	307.63	120.37
ZT20N-2	428	1.6	426.4
ZT20N-3	150	113.98	36.02
ZT20N-4	150	0	150
ZT20N-5	428	0	428

IV.2 Inventory of stored RAW at NPP V2

IV.2.1 Utilised capacity of storage premises for SRAW storage

Storage of SRAW in pallets

Storage facility	Capacity /pallets/	Utilised capacity /pallets/	Free capacity /pallets/
Total	**0**	**1,613**	**307**

Storage of SRAW at storage facilities without internal structure

Storage facility	Overall capacity /drums/	Utilised capacity /drums/	Free capacity /drums/
Total	**0**	**11,490**	**2,758**

Storage of air-born filters at storage facility 108/12

Cell number	Capacity /pcs/	Utilised capacity /pcs/	Free capacity /pcs/
Total	**0**	**228**	**640**

IV.2.2 Utilised capacity of LRAW storage premises

Storage of ra-concentrate

Tank	Capacity [m^3]	Utilised capacity [m^3]	Volume converted into total salinity 190g/kg [m^3]	Summary activity [kBq/l]	Free capacity [m^3]
Total	**0**	**2,908**	**2,757**		**1,852**

Storage of low level and medium level sorbents

Tank	Capacity [m^3]	Utilised capacity [m^3]	Free capacity [m^3]
0TW20B01	460	17	443
0TW30B02	460	83.4	376.6
0TW30B05	460	0	460

IV.3 Inventory of stored RAW at SE-EMO

IV.3.1 Utilised capacity for SRAW storage

SRAW storage in sacks on pallets

Storage facility	Capacity /pallets/	Utilised capacity /pallets/	Free capacity /pallets/
108/6	640	640	0
Total	640	640	0

SRAW storage in barrels on barrels

Storage facility	Capacity *(pallets/drums)*	Utilised capacity *(pallets/drums)*	Free capacity *(pallets/drums)*
108/7	220/770	165/660	55/110
108/8	220/770	165/660	55/110
108/12	220/770	9 (pallets ventilation filters), 33 (pallets with barrels) /132	178/638
Total	660/2,310	372/1,452	288/858

SRAW storage at storehouses without built-in

Storage facility	Capacity *(m^3)*	Utilised capacity *(m^3)*	Free capacity *(m^3)*
108/9	594	0	594
108/10	396	0	396
108/11	198	0	198
108/13	594	0	594
Total	1,782	0	1,782

IV.3.2 Utilised capacity of LRAW storage premises

Storage of ra-concentrate

Tank	Capacity (m^3)	Real utilised capacity (m^3)	Total activity (kBq/l)	Free capacity (m^3)
7KPK10BB002	550	550	1.34	0
7KPK10BB003	550	550	15	0
7KPK10BB004	550	550	8.4	0
7KPK10BB005	550	113	8.4	437
7KPK10BB006	460	0	-	460
Total	2,660	1,763	-	897

Storage of ion exchangers

Tank	Capacity	Utilised capacity	Free capacity
7KPK20BB001	460	24.5	435.5
7KPK30BB002	460	40.3	419.7
Total	920	64.8	855.2

IV. 4 Inventory of stored RAW at SE-VYZ (as of 30.6.2005)

IV.4.1 Filling of SE-VYZ storage premises for SRAW storage as of 30 June 2005

Storage facility (unit No./room No.)	Overall capacity (m^3)	Utilised capacity (m^3)	Free capacity (m^3)
32/106	272	271.8	0.2
32/97	450	428	110
32/30-54	900	840.2	299
34/1	572	570.6	7

Storage premises for SRAW storage are filled with 200 l MEVA barrels
(1 m^3=5 barrels)
A total of 12,880 barrels with solid RAW were stored at SE-VYZ certified storehouse as of 30 June 2005, of which:

- 2,407 barrels with solid combustible RAW
- 2,242 barrels with compactable metallic RAW
- 6,229 barrels with compactable non-metallic RAW
- 2,002 barrels with solid RAW intended for FCC without treatment (barrels with bitumen and cement products)

IV.4.2 Inventory of SE-VYZ solid RAW at SE-VYZ premises as of 30 June 2005

No.	RAW type	Location (Units No.)	Capacity (m^3)	Weight (t)
1.	**Non-sorted combustible waste**	30	**70**	**28.00**
2.	**Combustible waste**	30,34.808,809,41,840	**36.4**	**9.056**
3.	**Compactable waste**	30,34,808,809,41,840	**47.8**	**17.010**
4.	**Ash**	808	**18.8**	**14.096**
5.	**Ventilation filters**	30,44/20,808, 809,840	**167.8**	**33.775**
6.	**Metallic RAW**	30,32,34,28,41, 809,840	**269**	**1,032.065**
7.	**Glass product VICHR**	30	**1.48**	**3.165**
8.	**RAW intended for FCC (BP,CP,SiAl)**	30,34,808,809	**105.5**	**160.096**
9.	**Contaminated soil**	44/10,839,38,	**6,156**	**7,387.200**
10.	**Concrete mix**	44/20,839,840	**1,063.5**	**1,273.600**
11.	**IRAW and CRAM**	30,32,34,809	**10.2**	**11.177**

IV.4.3 Inventory of SE-VYZ liquid RAW located at SE-VYZ premises as of 30 June 2005

Ser. No.	LRAW type	Location (Units No.)	Capacity (m^3)	Remark
1.	**Ra-concentrate**	41,44/10,808,809	**28.448**	
2.	**Ra-waters**	30,34,808,809,41	**121.4**	
3.	**Chrompik**	30	**13.8**	
4.	**Ra-oil**	34,808	**40.183**	
5.	**Dowtherm**	30,808	**26.213**	
6.	**Ra-slurries**	30,41,44/10,	**297.075**	
7.	**Other LRAW**	30	**19.49**	Ion exchangers, etalons, D_2O residues
8.	**IRAW**	34	**0.2874**	Liquid scintillator etalons, ra-waters

IV.5 RAW quantities treated and conditioned at RAW BCC

	Treated (conditoned)	**in 2003**	**in 2004**
Filled FCC		210 pcs	232 pcs
Transported to national repository		214 pcs	218 pcs
Elementary system (ES)	**Waste type**	**Quantity**	**Quantity**
PS 04 - Cementation	Washing liquid Bitumen product (encapsulation) Non-compacted (encapsulation)	25.16 m^3 957 pcs 23.995 t	25.9 m^3 976 pcs (244 t) 48 t
PS 06 - Incinerator	**Solid RAW (total)** VYZ V-1 V-2 EMO **Liquid RAO (total)** VYZ - dowtherm VYZ - oil V-1 - oil	**91.3 t** 62.4 t 19 t 9.9 t **12.4 m^3** 8.23 m^3 2.96 m^3 1.24 m^3	**76.2 t** 57.7 t 7.6 t 10.1 t 0.8 t **4.2 m^3** 2.85 m^3 1.38 m^3
PS 08 - Compacting eqipment	**Total** VYZ V-1 V-2 Ash IRAW	**112.21 t *** 71.28 t 28.45 t 12.48 t	**121.83 t *** 70.36 t 33.8 t 15.38 t 1.33 t 0.96 t
PS 03 - Concentration	**Total** V-1 concentrate V-2 concentrate	**355.8 m^3 *** 200 m^3 155.8 m^3	**374.5 m^3 *** 185.3 m^3 189.2 m^3
PS 05 - Sorting	**Solid RAW**	**24.709 t** (190 barrels)	**29.78 t** (729 barrels)

- product subsequently treated by cementation into FCC

IV.6.4 from SE-VYZ controlled zone into the environment

Year	Quantity of waste released into environment /kg/	Waste type
2004	115,906 22,855	iron scrap concrete debris
As of 30 June 2005	42,166 31,173	iron scrap concrete debris

Annex V.

List of selected national laws, decrees and guides

Act No. 575/2001 Coll. on organisation of government activity and organisation of central state administration, as amended (most recent amendment by Act No. 654/2004 Coll.)

Act No. 541/2004 Coll. on peaceful uses of nuclear energy (Atomic Act) and on alteration and amendment to certain laws

Act No. 50/1976 Coll. on land planning and building regulations (Building Act) (most recent amendment by Act No. 541/2004 Coll.)

Act No. 656/2004 Coll. on energy and on alteration and amendment to certain laws

Act No. 254/1994 Coll. on the State Fund for Decommissioning of Nuclear Installations and Management of Spent Fuel and Radioactive Wastes, as amended (most recent amendment No. 523/2004 Coll.)

Act No. 127/1994 Coll. on environmental impact assessment, as amended (most recent amendment No. 587/2004 Coll.)

Act No. 272/1994 Coll. on human health protection, as amended (most recent amendment No. 2/2005 Coll.)

Act No. 42/1994 Coll. on civil protection, as amended (most recent amendment No. 515/2003 Coll.)

Act No. 95/2000 Coll. on labour inspection, as amended (most recent amendment No. 541/2004 Coll.)

Act No. 330/1996 Coll. on occupational health and safety, as amended (most recent amendment No. 215/2004 Coll.)

Act No. 264/1999 Coll. on technical requirements for products (conformity assessment), as amended (most recent amendment No. 254/2003 Coll.)

Act No. 90/1998 Coll. on building products, as amended (most recent amendment No. 134/2004 Z. z.)

MoEnv Regulation No. 453/2000 Coll. implementing certain provisions of the Building Act

Slovak Labour Safety Regulation No. 66/1989 Coll. for assurance of safety of technical items in nuclear energy, as amended by Regulation No. 31/1991 Coll.

MoEnv Regulation No. 55/2001 Coll. on land planning documents

MoH Regulation No. 12/2001 Coll. on requirements for radiation protection

Regulation No. 718/2002 Coll. on occupational health and safety and safety of technical items

Regulation No. 111/1975 Coll. on registration of occupational accidents and on reporting operational accidents (breakdowns) and failures of technical items, as amended by Regulation No. 483/1990 Coll.

Regulation No. 59/1982 Coll. laying down the basic requirements for safety of labour and of technical items, as amended by Act No. 484/1990 Coll.

Regulation No. 374/1990 Coll. on safety of labour and of technical items in construction work

Government Regulation No. 391/1999 Coll. layinf down particulars of technical requirements for machinery, as amended (most recent amendment No. 161/2002 Coll.)

Government Regulation No. 392/1999 Coll. laying down particulars of technical requirements and procedures for conformity assessment for electric equipment which are used within a certain range of

voltage, as amended (most recent amendment No. 303/2002 Coll.)

Government Regulation No. 394/1999 Coll. laying down particulars of technical requirements for products in terms of electromagnetic compatibility, as amended (most recent amendment No. 301/2002 Coll.)

Government Regulation No. 400/1999 Coll. on technical requirements for products, as amended (most recent amendment No. 4/2003 Coll.)

Government Regulation No. 159/2001 Coll. on minimum safety and health requirements in the use of working means (most recent amendment No. 470/2003 Coll.)

Government Regulation No. 201/2001 Coll. on minimum safety and health requirements for a workplace

Government Regulation No. 247/2001 Coll. on minimum safety and health requirements at work with display units

Government Regulation No. 117/2001 Coll. laying down particulars of technical requirements and procedures for conformity assessment and protective systems intended for use in an environmental involving explosion hazard (most recent amendment No. 296/2002 Coll.)

Government Regulation No. 444/2001 Coll. on requiorements for the use of dsignation, symbols and signals for occupational health and safety

Government Regulation No. 510/2001 Coll. on minimum safety and health requirements for a building site (most recent amendment No. 282/2004 Coll.)

Government Regulation No. 493/2002 Coll. on minimum requirements for occupational health and safety in an explosive environment (effective as of 1 January 2003)

Government Regulation No. 504/2002 Coll. on the conditions for provision of personal protective devices

Note:

A the time of preparation of this National Report there were new draft 13 Regulations on Atomic Act No. 541/2004 Coll. at the phase of preparation following the inter-ministerial comment procedure.

ÚJD safety guidelines:

BNS I.12.1/1995	Requirements for assurance of quality of a computer information software
BNS I.11.1/1995	Requirements for preparation of safety analyses
BNS I.4.2/1996	Use of PSA methodology in the performance of state supervision
BNS I.4.1/1999	Single failure criterion
BNS I.9.1/1999	Safety of nuclear installations in decommissioning thereof
BNS I.11.2/1999	Requirements for preparation of safety analyses for processes of abnormal operation with an automatic reactor protection failure
BNS III.4.1/2000	Requirements for issue of ÚJD SR permit to use fuel in WWER-440 reactors
BNS III.4.3/2000	Requirements for assessment of fuel charges
I. BNS I.2.6/2000	ÚJD SR requirements for Chapter 4 of the safety report “Core Design“
BNS II.3.1/2000	Assessment of permissibility of defects detected in in-service checks of classified nuclear installations
BNS II.5.1/2002	Welding of nuclear installations. Basic requirements and rules
BNS II.5.2/2002	Control of welding and quality of weld joints of nuclear installations. Requirements
BNS II.5.3/2002	Welding materials for welding nuclear installations. Technical requirements and selection rules
BNS II.3.1/2003 dotlač II.3.1/2000	Assessment of permissibility of defects detected in in-service checks of classified nuclear installations
II. BNS I.2.6/2001	Assurance of quality of safety documentation. Basic requirements and procedures
BNS II.2.1/2001	Requirements for assurance of fire safety of nuclear power plants in terms of nuclear safety

BNS I.9.2/2001 Control of aging of nuclear power plants - Requirements

BNS II.5.1/2003 Welding of nuclear installations. Basic requirements and rules
dotlač II.5.1/2002

BNS II.5.2/2003 Control of welding and quality of nuclear installations - Requirements
dotlač II.5.2/2002

BNS II.5.3/2003 Welding materials for welding nuclear installations. Technical requirements and
dotlač II.5.3/2002 selection rules

BNS I.9.1/2003 Safety of nuclear installations in decommissioning thereof
dotlač I.9./1999

BNS I.11.2/2003 Requirements for preparation of safety analyses for processes of abnormal operation
dotlač I.11.2/1999 with an automatic reactor protection failure

BNS I.12.1/2003 Requirements for assurance of quality of a computer information software
dotlač I.12.1/1995

BNS II.3.3/2004 Metallurgical products and spare parts for nuclear installations

BNS III.4.4/2004 Requirements for preparation, implementation and assessment of results of physical start-up program tests

BNS II.5.4/2004 Qualification of non-destructive testing systems in nuclear energy. Requirements and guidelines

BNS I.2.5/2005 ÚJD SR requirements for Chapter 16 Pre-operational Safety Analysis Report "Limits and Conditions"

BNS I.8.1/2005 Specification of contents of the Preliminary Physical Protection Plan and of the Physical Protection Plan in accordance with the text of the Regulation laying down particulars on assurance of physical protection of NI, NM, RAW

BNS IV.1.3/2005 Requirements for design and operation of the spent fuel storage facility

Annex VI. List of international expert reports and safety analysis reports

VI. 1. Missions of the IAEA and other international organisations

SE-EMO missions

- A WANO mission held 7-25 October 2002 was focused on the verification of NPP Mochovce operation, preparation and maintenance. A final report was prepared assessing best practices and areas of improvement of utility activity that will manifest themselves in improved values for WANO operation indicators. The mission conclusions are used to improve NPP Mochovce operation indicators.
- A follow-up WANO review took place 21-25 June 2004 with its focus on control activities of tasks resulting from the previous peer review of 2002. The final report assessment stated that the NPP Mochovce complied with the world´s standards in two out of 16 reviewed areas.

VI.2 Assessment of safety of spent fuel management system and facility operation

For description, see the 2003 National Report.

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and other contributors whom we thank for their co-operation.