

# **NATIONAL REPORT of THE CZECH REPUBLIC**

**under Article 9.1**

**of the Council Directive 2009/71/EURATOM establishing  
a Community framework**

**for the nuclear safety of nuclear installations, as  
amended by the Council Directive 2014/87/EURATOM  
of 8 July 2014**

**SEPTEMBER 2020**



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## List of Abbreviations

<b>ASSET</b>	Assessment of Safety Significant Events Team
<b>Atomic Act</b>	Act No. 263/2016 Coll., the Atomic Act, as amended
<b>CV Řež</b>	Research Center Řež, s.r.o.
<b>ČEZ</b>	Joint stock company ČEZ, a. s.
<b>ČVUT</b>	Czech Technical University in Prague
<b>EC</b>	European Commission
<b>ECC</b>	Emergency Command Centre
<b>EDU</b>	Dukovany NPP
<b>EIC</b>	Emergency Information Centre
<b>ERO</b>	Emergency Response Organization
<b>EU</b>	European Union
<b>ETE</b>	Temelín NPP
<b>FA</b>	Fuel Assembly
<b>HPES</b>	Human Performance Evaluation System
<b>IAEA</b>	International Atomic Energy Agency
<b>ICRP</b>	International Commission for Radiological Protection
<b>IERO</b>	Internal Emergency Response Organization
<b>ISFSF</b>	Interim Spent Fuel Storage Facility
<b>INES</b>	International Nuclear Event Scale
<b>INPO</b>	Institute of Nuclear Power Operators
<b>INSAG</b>	International Nuclear Safety Advisory Group
<b>IPPAS</b>	International Physical Protection Advisory Service
<b>IPERS</b>	International Peer Review Service
<b>IRRT</b>	International Regulatory Review Team
<b>LBB</b>	Leak Before Break
<b>LTO</b>	Long Term Operation
<b>MCR</b>	Main Control Room
<b>NSD</b>	The Council Directive 2009/71/EURATOM establishing a Community framework for the nuclear safety of nuclear installations, as amended by the Council Directive 2014/87/EURATOM of 8 July 2014
<b>NPP</b>	Nuclear Power Plant
<b>NUREG</b>	Nuclear Regulation
<b>OECD-NEA</b>	Nuclear Energy Agency within the Organization for Economic Cooperation and Development
<b>OESC</b>	Off-site Emergency Support Centre
<b>OSART</b>	Operational Safety Review Team
<b>PRIS</b>	Power Reactor Information System
<b>PSA</b>	Probabilistic Safety Assessment
<b>PSR</b>	Periodic Safety Review
<b>PWR</b>	Pressurized water reactor
<b>RAW</b>	Radioactive Waste
<b>SALTO</b>	Safe Long Term Operation
<b>SAMGs</b>	Severe Accident Management Guidelines
<b>SF</b>	Spent Fuel
<b>SFSF</b>	Spent Fuel Storage Facility
<b>SÚJB</b>	State Office for Nuclear Safety
<b>SÚJCHBO</b>	National Institute for Nuclear, Chemical and Biological Protection
<b>SÚRAO</b>	Radioactive Waste Repository Agency
<b>SÚRO</b>	National Radiation Protection Institute
<b>TSC</b>	Technical Support Centre
<b>ÚJV Řež</b>	Nuclear Research Institute in Řež, a.s.
<b>US NRC</b>	US Nuclear Regulatory Commission
<b>VVER</b>	Type identification for pressurized water reactors designed in the former Soviet Union
<b>WANO</b>	World Association of Nuclear Operators

**WENRA**

Western European Nuclear Regulators Association

# 1 Introduction

## Preamble

This is a national report of the Czech Republic on the implementation of the Council Directive 2009/71/EURATOM establishing a Community framework for the nuclear safety of nuclear installations, as amended by the Council Directive 2014/87/EURATOM of 8 July 2014. The report was prepared by the Czech nuclear regulatory authority, the SÚJB, with the support of its technical support organization, the SÚRO, under Article 9.1 of the Council Directive 2009/71/EURATOM as amended by the Council Directive 2014/87/EURATOM of 8 July 2014. The report reflects the status of the directive implementation as of September 2020.

## List of civilian nuclear installations

Nuclear installations as defined in Article 3.1 of the Directive operated in the Czech Republic:

Table 1

Site	Nuclear installation	No. of units	Type	Commissioning	Operator
Dukovany	NPP Dukovany	4	VVER 440/213	1985-1987	ČEZ
	Interim Spent Fuel Storage Facility Dukovany	1		1995	ČEZ
	Spent Fuel Storage Facility Dukovany	1		2006	ČEZ
	Radioactive Waste Disposal Facility Dukovany	1		1995	SÚRAO
Temelín	NPP Temelín	2	VVER 1000/320	2000-2004	ČEZ
	Spent Fuel Storage Facility Temelín	1		2010	ČEZ
Řež	Research Reactor in Řež	1	LVR 15	1972	CV Řež
	Research Reactor in Řež	1	LR-0	1995	CV Řež
	Spent fuel and high level waste storage facility Řež	1		1997	ÚJV Řež
CVUT Praha	Training Reactor Prague	1	VR-1	1992	ČVUT

## Description of Nuclear Installations

### 1.1.1 Dukovany site

#### 1.1.1.1 Dukovany NPP

Dukovany NPP includes four reactor units of VVER 440/213. The units were commissioned as follows:

Unit 1	-	1985
Unit 2	-	1986
Unit 3	-	1987
Unit 4	-	1987

After reconstruction which undergone in 2009-2012 electrical power of each unit at Dukovany NPP has reached 500 MW. In 2013, the installed power output of the power plant amounted to 2000 MW and represented nearly 10 % of the total capacity installed within the power utility.

The spent fuel pool is located close to the reactor in the reactor building. More detailed description of NPP Dukovany units, including technical specifications of the plant, is provided in the National Report of the Czech Republic under the Convention on Nuclear Safety [1].

#### 1.1.1.2 Interim Spent Fuel Storage Facility at Dukovany site

ISFSF in Dukovany is located on the NPP Dukovany site and operated by ČEZ, a. s. It is designed for a dry storage of SF using CASTOR-440/84 casks. ISFSF Dukovany forms an independently operated facility linked to existing engineering utility networks of NPP Dukovany. The total capacity of ISFSF Dukovany (60 casks) has been exhausted and the facility shut.

More detailed information about ISFSF, including the technical specifications of the facility, is provided in the National Report of the Czech Republic under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2].

#### 1.1.1.3 Spent Fuel Storage Facility at Dukovany site

In 2008, a new SFSF Dukovany was commissioned at Dukovany NPP site. It is used for dry storage of SF using CASTOR-440/84M casks. Its storage capacity (1340 t of heavy metal in 133 casks) is sufficient to cover all the SF production of NPP Dukovany, after the existing storage capacity of ISFSF Dukovany was exhausted, with the anticipated operation of the units at least until 2035.

As of December 31, 2013 SFSF Dukovany contained 24 CASTOR-440/84M casks with the total number of 2016 FAs.

More detailed information about SFSF, including the technical specifications of the facility, is provided in the National Report of the Czech Republic under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2].

#### 1.1.1.4 Radioactive Waste Repository Dukovany (Radioactive Waste Disposal Facility Dukovany)

The Radioactive waste repository Dukovany is used to dispose of low-level and intermediate level radioactive waste from both the nuclear power plants in the Czech Republic (NPP Dukovany and NPP Temelín), and a limited amount of institutional RAW. The repository is operated by Správa úložišť radioaktivních odpadů, SÚRAO, which is a state organization ensuring the safe disposal of radioactive waste in the Czech Republic in compliance with the requirements of nuclear safety, radiation protection and public health and environmental protection.

More detailed information about the Radioactive waste repository Dukovany, including the technical specifications of the facility, is provided in the National Report of the Czech Republic under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2].

## **1.1.2 Temelín site**

### *1.1.2.1 Temelín NPP*

Temelín Nuclear Power Plant (Temelín NPP) includes two reactor units VVER 1000/320. Both units were commissioned in 2000 - 2004 with installed electrical power 1000 MW/unit. In 2013, the installed power output of the power plant amounted to 2120 MW.

The basic description of NPP Temelín units, including the technical specifications of the plant, is provided in the National Report of the Czech Republic under the Convention on Nuclear Safety [1].

The spent fuel pool is located close to the reactor in the reactor building. The low-level and intermediate level radioactive waste from NPP Temelín is transported to the Radioactive waste repository in Dukovany and disposed of there.

### *1.1.2.2 Spent Fuel Storage Facility Temelín*

The SFSF Temelín, located on the NPP Temelín site, is used for dry storage of the SF from NPP Temelín using CASTOR-1000/19 casks. The storage capacity of SFSF Temelín is sufficient to cover all SF production of NPP Temelín for 30 years of its operation. The storage capacity of SFSF Temelín is 1370 t of heavy metals in 152 casks. Currently the SFSF Temelín contains 24 CASTOR-440/84M casks with the total number of 266 FAs. SFSF Temelín is operated by ČEZ, a.s.

More detailed information about SFSF Temelín, including the technical specifications of the facility, is provided in the National Report of the Czech Republic under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2].

## **1.1.3 Řež site**

### *1.1.3.1 Research reactor LVR-15*

The research reactor LVR-15 (with the thermal power 10 MW) is situated near Prague on the site of the nuclear research institute ÚJV Řež and the research center CV Řež. During 1988 – 1989 the reactor underwent a radical reconstruction with the goal to upgrade a power and increase the safety. Test operations of the LVR-15 reactor was commenced in 1989, and since 1995 the reactor has been operated on full power (10 MW).

The reactor LVR-15 serves primarily for material studies and production of radiopharmaceuticals. The research reactors are operated by the CV Řež.

The research center CV Řež was founded on the 9th October 2002 (as a 100% daughter company of the nuclear research institute ÚJV Řež) for the purposes of research and development and natural and technical sciences. The core activity of the CV Řež is the provision of an experimental base for research and development on the reactors LR-0 (see below) and LVR-15.

The basic description of the LVR-15 research reactor, including the technical specifications, is provided in the National Report of the Czech Republic under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2], in the National Report under the Convention on Nuclear Safety of September 2001 and on <http://www.cvrez.cz/en/infrastructure/research-reactor-lvr-15/>.

### 1.1.3.2 *Research Reactor LR-0*

In 1980, the reactor TR-0 (heavy water reactor with “zero” output) was completely rebuilt into reactor LR-0, an experimental light water reactor with “zero” output. Since then, LR-0 has served mainly for research of reactor cores, storage lattices and experimental modelling of VVER-1000 and VVER-440 type reactors. The reactor was put into permanent operation in June 1983.

The LR-0 reactor has been designed in a universal manner, suitable for physics experiments linked to VVER-type reactor cores with a wide range of cartridge quantities, fuel enrichment, along with various concentrations of the H<sub>3</sub>BO<sub>3</sub> reactor moderator, numerous variations in configurations of absorptive elements in the cartridges, etc. A very important part of research works at the LR-0 reactor is the modelling and experimental verification of radiation damage to materials used for internal reactor assemblies and VVER reactor vessels.

The design of the LR-0 reactor considered specific requirements for both, the reactor safety under all operational conditions, and physics research of VVER-type reactor cores.

The basic description of the LR-0 research reactor, including the technical specifications, is provided on RCR website <http://www.cvrez.cz/en/infrastructure/research-reactor-lr-0/> and in the National Report of the Czech Republic under the Joint Convention, Revision 1.1 of February 2003 and the National Report under the Convention on Nuclear Safety of September 2001.

### 1.1.3.3 *Storage Facility for Spent Fuel and High-Level Waste*

The storage facility located on the site of the the nuclear research institute ÚJV Řež is designed for the storage of SF and solid RAW produced in ÚJV Řež and in the CV Řež. The facility was built in 1981 – 1988. Its trial operation started in 1995 and the facility has been in commercial operation since 1997. The structural details of this storage facility are provided in the National Report of the Czech Republic under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2]. The storage facility is operated by the ÚJV Řež.

## 1.1.4 **Training Reactor ČVUT, Praha**

### 1.1.4.1 *Training Reactor*

The Training reactor VR-1 is a pool type reactor, with a nominal power of 1 kW and for short period up to 5 kW. It was designed and constructed in the late 1980s, and has been in operation in the Czech Republic since 1990. The reactor is operated by the Department of Nuclear Reactors of the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague. It is a key facility for education and training of students in nuclear engineering, reactor and neutron physics, safety studies of nuclear installations, nuclear fuel cycle, and fuel management. The reactor offers more than 25 experiments for undergraduate and graduate students as well as for training of NPP and research reactor operators.

The basic description of the VR-1 unit, including the technical specifications of the facility, is provided in the National Report of the Czech Republic under the Convention on Nuclear Safety [1] and on website: [http://reactorvr1.eu/index\\_e.php](http://reactorvr1.eu/index_e.php).

## 1.1.5 **National policy and strategy**

In May 2015, the Government approved the State Energy Policy of the Czech Republic and in June 2015 the National Action Plan for the Development of the Nuclear Energy Sector in the Czech Republic. These two national strategies, which are relevant to the energy sector and the use of nuclear energy, identify nuclear safety and independent state nuclear supervision as elements of the top importance and priority. The strategies also define a series of tasks so as to strengthen nuclear legislation and maintain and strengthen independent nuclear regulatory authority. National policy and strategy for safety is manifested primarily through the pertinent legislation and strong and independent nuclear

regulatory authority. State nuclear safety strategy is not formalized in one single document. In the Czech Republic's administrative system such highly political documents are usually formally issued only when the existing context requires so, e.g. when multiple „actors“ are involved in the processes. This is not the case of nuclear safety and radiation protection regulation where only one state administration body, the SÚJB, has comprehensive powers and responsibilities. However, in 2017 the SÚJB adopted its own strategy for the years 2017 – 2020 proclaiming nuclear safety as the highest priority.

## 2 Article 4 - Legislative, regulatory and organizational framework

Article 4.1 - National legislative, regulatory and organisational framework

### 2.1.1 Legislative framework

Between 2014 and 2020, the Czech legal framework underwent crucial reform of the nuclear law. Comprehensive national system of laws and regulations regulating peaceful utilization of nuclear energy and ionizing radiation, formed earlier by the Act No. 18/1997 Coll., on Peaceful Utilisation of Nuclear Energy and Ionising Radiation, as amended, and its supplementary regulations, was replaced by the Atomic Act and its secondary legal acts. Former legislation was repealed on the 1<sup>st</sup> January 2017. New nuclear law comprehensively regulates all aspects of peaceful utilization of nuclear energy and ionizing radiation and fully transposes the Council Directive 2009/71/EURATOM establishing a Community framework for the nuclear safety of nuclear installations, as amended by the Council Directive 2014/87/EURATOM. Moreover, the new nuclear law transposes all other EURATOM directives and regulations, as adopted until 2016.

In relation to new nuclear legislation, practical needs required to implement several transition periods to allow the stakeholders to adapt to the new legal environment. Therefore, the old nuclear law was partially applicable until 2018 and in some aspects even until 2020. Despite this fact, the Council Directive 2009/71/EURATOM, as amended by the Council Directive 2014/87/EURATOM was fully transposed into the new legislation and applied as required.

With respect to the aforementioned legal development in the Czech Republic, the report reflects in general both, former and actual legal framework. Nevertheless, the new nuclear law, as represented by the Atomic Act and its secondary legal acts, is emphasized by this report since it fully regulates the nuclear safety framework since 2020. Older legislation is mentioned in the report where appropriate.

#### *Acts regulating nuclear safety*

Before the 1<sup>st</sup> January 2017 the main legislative act in the area of nuclear safety was the Act No. 18/1997 Coll., on Peaceful Utilisation of Nuclear Energy and Ionising Radiation, as amended. This Act was published in the Collection of Laws on 24 January 1997 and entered into force on the 1<sup>st</sup> July 1997.

In relation to the adoption of the Atomic Act (Act No. 263/2016 Coll.) the Act No. 18/1997 Coll. was significantly amended by the Act No. 264/2016 Coll. This amendment repealed most of the content of the Act No. 18/1997 Coll. and kept in force only a part of the original text dealing with civil liability for nuclear damages. However, the remaining part of the Act No. 18/1997 Coll. in its original form (and its supplementary regulations) was still applicable in a limited scope for former license holders, including operators of nuclear facilities, for following transitional periods:

- till the 1<sup>st</sup> January 2018 – in the field of radiation protection,
- till the 1<sup>st</sup> January 2019 – in the field of nuclear safety,
- till the 1<sup>st</sup> January 2020 – in the field of management system.

As for the Act No. 18/1997 Coll., it entrusted the executive (state administration) and regulatory (supervision) powers in the area of peaceful utilization of nuclear energy and ionizing radiation to the State Office for Nuclear Safety.

The scope of the Act No. 18/1997 Coll. was defined as follows (Article 1 of the Act):

- the method of utilising nuclear energy and ionizing radiation, and conditions for the performance of practices related to nuclear energy utilization and radiation activities;



- the system for protection of people and the environment from undesirable effects of ionizing radiation;
- obligations during preparation for and implementation of intervention intended to reduce exposures to natural sources and exposures due to radiation accidents;
- specific requirements for civil liability in the case of nuclear damage;
- conditions for safe management of radioactive waste;
- performance of state administration and supervision within nuclear energy utilization, within radiation activities and over nuclear items.

The (new) Atomic Act entered into force on the 1<sup>st</sup> January 2017 and replaced the Act No. 18/1997 Coll. in its role of the comprehensive primary regulation of the nuclear safety framework. The Atomic Act incorporates the relevant legislation of the Euratom and the European Union, follows on from directly applicable legislation of the Euratom and the European Union, and governs:

- the conditions for the peaceful uses of nuclear energy;
- the conditions for performing activities in exposure situations;
- radioactive waste and spent fuel management;
- the type-approval of certain products in the area of peaceful utilization of nuclear energy and ionizing radiation and the conditions for carriage of radioactive or fissile materials, radioactive waste or spent fuel;
- radiation situation monitoring;
- radiation extraordinary event management;
- the conditions for security of nuclear installations, nuclear materials and sources of ionizing radiation;
- the requirements for ensuring the non-proliferation of nuclear weapons;
- the exercise of state administration in the area of the peaceful utilization of nuclear energy and ionizing radiation.

As the previous legislation, the Atomic Act establishes the SÚJB as a central administrative authority for the area of peaceful use of nuclear energy and ionizing radiation.

#### *Implementing regulations to the Acts regulating nuclear safety*

The Czech legal framework traditionally authorizes the state central administrative bodies, such as the SÚJB, to issue implementing decrees. In specified topics the Government is authorized to adopt the secondary legislation in the form of Government Regulations. Differences between the two types of secondary regulations are mostly formal and legally technical, they are both of the same legal power and their function is to implement and supplement the Acts.

According to the Act No. 18/1997 Coll., the implementing regulations in force until the 1<sup>st</sup> January 2017 and applicable in the same transitional periods as the Act itself were as follows:

- Decree No. 144/1997 Coll., on the physical protection of nuclear materials and nuclear facilities and their classification, as amended by Decree No. 500/2005 Coll.;
- Decree No. 146/1997 Coll., specifying activities directly affecting nuclear safety and activities especially important from radiation protection viewpoint, requirements on qualification and personnel training, on methods to be used for verification of special professional competency and for issue authorizations to selected personnel, and the form of documentation to be approved for the licensing of expert training of selected personnel, as amended by Decree No. 315/2002 Coll.;
- Decree No. 215/1997 Coll., on criteria for siting of nuclear installations and very significant ionizing radiation sources;

- Decree No. 106/1998 Coll., on nuclear safety and radiation protection assurance during commissioning and operation of nuclear facilities;
- Government Regulation No. 11/1999 Coll., on emergency planning zones;
- Decree No. 195/1999 Coll., on basic design criteria for nuclear installations with respect to nuclear safety radiation protection and emergency preparedness;
- Decree No. 307/2002 Coll., on radiation protection, as amended by SÚJB Decree No. 499/2005 Coll. and Decree No. 389/2012 Coll.;
- Decree No. 317/2002 Coll., on type-approval of packagings for shipment, storage and disposal of nuclear materials and radioactive substances, on type-approval of ionizing radiation sources and shipment of nuclear material and specified radioactive substances (on type-approval and shipment), as amended by Decree No. 317/2002 Coll. and Decree No. 77/2009 Coll.;
- Decree No. 318/2002 Coll., on details of emergency preparedness of nuclear facilities and workplaces with ionizing radiation sources and on requirements on the content of on-site emergency plan and emergency rule, as amended by Decree No. 2/2004 Coll.;
- Decree No. 319/2002 Coll., on function and organization of the National Radiation Monitoring Network, as amended by Decree No. 27/2006 Coll.;
- Decree No. 360/2002 Coll., establishing a method to create a financial reserve for decommissioning of nuclear installations or workplaces in categories III or IV;
- Government Regulation No. 416/2002 Coll., on the amount and terms of payments to the nuclear account by radioactive waste producers and the annual subsidy to the communities and the rules for its payment, as amended by Government Regulation No. 46/2005 Coll., Government Regulation No. 341/2009 Coll. and Government Regulation No. 461/2011 Coll.;
- Decree No. 419/2002 Coll., on personal radiation passes;
- Decree No. 185/2003 Coll., on the decommissioning of nuclear installations or workplaces of category III or IV;
- Decree No. 193/2005 Coll., sets the list of theoretical and practical areas forming the education and preparation content required in the Czech Republic for the performance of regulated activities belonging to the competence of the SÚJB;
- Decree No. 309/2005 Coll., on assurance of technical safety of selected equipment;
- Decree No. 461/2005 Coll., on the procedure for providing subsidies intended for the introduction of measures leading to a reduction of indoor exposure to natural radionuclides and a reduction of natural radionuclide concentration in drinking water appointed for public supply;
- Decree No. 462/2005 Coll., on the distribution and collection of detectors intended for identification of buildings with an increased level of exposure to natural radionuclides and on conditions for acquirement of state budget subsidy;
- Decree No. 132/2008 Coll., on a Quality Assurance System in carrying out activities connected with utilization of nuclear energy and radiation protection and on Quality assurance of selected equipment in regard their assignment to classes of nuclear safety;
- Government Regulation No. 73/2009 Coll., on information exchange related to the international transport of radioactive waste and spent fuel;
- Decree No. 165/2009 Coll., establishing a list of Trigger list items;
- Decree No. 166/2009 Coll., establishing a list of selected items of dual use in the nuclear area;
- Decree No. 213/2010 Coll., on accounting for and control of nuclear material and on reporting of data required by EC regulations;
- Government Regulation No. 399/2011 Coll., on fees for professional activities of the State Office for Nuclear Safety;

According to the Atomic Act, which has been in force since the 1<sup>st</sup> January 2017, the following secondary legal instruments regulate peaceful utilization of nuclear energy and ionizing radiation:

- Government Regulation No. 347/2016 Coll., on fees for professional activities of the State Office for Nuclear Safety;
- Decree No. 358/2016 Coll., on requirements for assurance of quality and technical safety and assessment and verification of conformity of selected equipment;
- Decree No. 359/2016 Coll., on details of ensuring radiation extraordinary event management;
- Decree No. 360/2016 Coll., on radiation situation monitoring;
- Decree No. 361/2016 Coll., on security of nuclear installation and nuclear material;
- Decree No. 362/2016 Coll., on the conditions for the award of the grant from the state budget in some existing exposure situations;
- Decree No. 374/2016 Coll., on the accountancy and control of nuclear materials and reporting of information on them;
- Decree No. 375/2016 Coll., on selected items in the nuclear area;
- Decree No. 376/2016 Coll., on dual-use items in the nuclear area;
- Decree No. 377/2016 Coll., on the requirements for the safe management of radioactive waste and on the decommissioning of nuclear installations or category III or IV workplaces;
- Decree No. 378/2016 Coll., on siting of a nuclear installation;
- Decree No. 379/2016 Coll., concerning the approval of some products in the field of peaceful use of nuclear energy and ionizing radiation and the carriage of radioactive or fissile material;
- Decree No. 408/2016 Coll., on management system requirements;
- Decree No. 409/2016 Coll., on activities especially important from nuclear safety and radiation protection viewpoint, special professional qualification and training of persons ensuring radiation protection of the registrant;
- Decree No. 422/2016 Coll., on radiation protection and security of a radioactive source;
- Decree No. 464/2016 Coll., on the procedure for providing subsidies from the state budget for the adoption of measures to reduce the level of radiation from the presence of radon and its transformation products in the indoor air of buildings for housing and public residence and for the adoption of measures to reduce the content of natural radionuclides in drinking water;
- Decree No. 21/2017 Coll., on nuclear safety assurance at nuclear installations;
- Government Regulation No. 35/2017 Coll., which sets the rate of a one-time fee for the disposal of radioactive waste and the amount of contributions from the nuclear account to municipalities and the rules for their provision;
- Decree No. 162/2017 Coll., on the requirements for nuclear safety assessment;
- Decree No. 329/2017 Coll., on the requirements for nuclear installation design;
- Decree No. 266/2019 Coll., on policy for radioactive waste management and spent fuel management;
- Decree No. 250/2020 Coll., on the method of establishing a reserve for the decommissioning of a nuclear installation and category III and category IV workplace.

Nuclear secondary legal instruments are usually accompanied by legally non-binding recommendations and guides published by the SÚJB in a special non-periodic series of publications: "Safety of Nuclear Installations - Requirements and Guides".

*Other important legislative acts relevant in the area of nuclear safety*

- Act No. 100/2001 Coll., on Environmental impact assessment, as amended
  - regulates the assessment of impacts of projects (construction works, activities and technologies) and conceptions (strategies, policies, plans or programmes) specified in the Act on the environment and on public health. It also regulates the roles and procedures of natural and legal persons, administrative authorities and territorial self-governing units in this assessment.

- Act No. 183/2006 Coll., on town and country planning and building code, as amended (Building Code)
  - regulates the objectives and tasks of town and country planning, the system of authorities of town and country planning, the town and country planning instruments, the assessment of the impacts on area sustainable development, decision-making within the area, possibilities of consolidation of procedures pursuant to this Act with procedures of the environmental impact assessment, conditions for construction, land development and for preparation of the public infrastructure, records of planning activity and qualification requirements for planning activity.
- Act No. 500/2004 Coll., Administrative Procedure Code, as amended
  - regulates the procedure of administrative authorities when performing administrative procedures. This Act is applied as *lex generalis* to the Atomic Act (the Atomic Act contains some specific administrative provisions which take precedence over the Administrative Procedure Code) when the SÚJB performs its executive powers, i. e. issues licenses etc.
- Act No. 255/2012 Coll., on inspection (Inspection Code), as amended
  - regulates the procedure of inspection authorities when performing the inspections activities (checks how the inspected parties fulfil the obligations specified in legal acts and provisions based on those legal acts).
- Act No. 634/2004 Coll., on Administrative Fees, as amended
  - specifies administrative fees and the execution of their administration, especially their assessment and collection, carried out by administrative authorities.
- Act No. 106/1999 Coll., on free access to information, as amended
  - sets the rules for the provision of information and further regulates the terms of the right to a free access to information. The SÚJB is bound according to this Act to provide information related to its competencies.
- Act No. 2/1969 Coll., on establishment of Ministries and other bodies of central government of the Czech Republic, as amended
  - Article 2 para 1 point 7 stipulates that the SÚJB is the Central Governmental Body; its articles 20 to 28a contain general principles of powers and responsibilities of the Central Governmental Bodies.
- Act No. 218/2000 Coll., on Budgetary Rules, as amended
  - defines, inter alia, the function and the process of creation of the state budget, its revenues and expenditures. The concrete state budget for each year is stipulated in a separate Act. The SÚJB has its own chapter within the state budget.
- Act No. 159/2006 Coll., on Conflict of Interests, as amended
  - defines, inter alia, the obligation of public officials to carry out their service in a way preventing any conflict between their private interests and the interests they are obligated to defend or protect in connection with their assignment, the limitations applicable to selected activities of public officials and the incompatibility of the office of a public official with other assignments. The public officials for the purposes of this Act are defined in Article 2, chairman of the SÚJB falls under Article 2 para 1 letter c).
- Act No. 239/2000 Coll., on Integrated Rescue System, as amended
- Act No. 240/2000 Coll., on Crisis Management, as amended
  - the latter two Acts define competencies and duties of individual subjects integrated in the rescue system and the principles of crisis management.

- Act No. 234/2014 Coll., on State Service, as amended
- regulates affairs and status of the state (civil) servants, i.e. state officials, including the SÚJB staff. It sets down rules for their appointment and cancellation of their function, their general obligations and rights and tools for enforcement in case of any deficiencies in their service performance. It strengthens independence of the servants and prevents their conflict of interests.

#### *Relevant international treaties and other legal instruments*

International treaties constitute an important part of the Czech legal framework. As regards their legal status, Article 10 of the Constitution stipulates, that promulgated international treaties, the ratification of which has been approved by the Parliament and which are binding on the Czech Republic, constitute a part of the legal order. Such treaties have higher legal power than national acts.

The Czech Republic is a contracting party of relevant international treaties and conventions that establish the common obligations and mechanisms for ensuring safety in the utilization of nuclear energy and ionizing radiation for peaceful purposes, and that provide for an effective coordinated international response to a nuclear or radiological emergency.

The international treaties signed by the Czech Republic (or the former Czechoslovak Socialist Republic and later the Czech and Slovak Federal Republic) are, in the area of competence of the SÚJB, listed on its website in the department “International cooperation”. In this regard it is necessary to mention at least the Convention on Nuclear Safety.

#### *Bilateral agreements on co-operation in nuclear safety*

The Czech Republic has concluded international agreements (on governmental level) on co-operation, or exchange of information, including crisis information, in the area of nuclear safety with all its neighboring countries (Austria, Poland, Germany, Slovakia) as well as with the following countries: Australia, Bulgaria, India, Canada, Korea, Hungary, Russian Federation, Ukraine and USA.

#### *Bilateral arrangements between regulators*

The SÚJB has concluded arrangements (on the level of regulatory authorities; i. e. memoranda) on co-operation or exchange of information, including crisis information, in the area of nuclear safety with the regulatory bodies of the following countries: Finland, France, Canada, Korea, Hungary, Germany, Romania, Russian Federation, Slovakia, Spain, Great Britain, Ukraine and USA. In some cases, these arrangements focus on a very narrow area.

#### *Regular bilateral co-operation*

Most of bilateral agreements and arrangements provide a legal base for the co-operation, which has an occasional character. Regular consultations about safety of nuclear installations take place with the following countries: Hungary, Germany, Poland, Austria, Slovakia and Slovenia.

#### *2.1.1.1 Organisational framework*

The main ministries and other bodies of state administration with competencies related to the area of nuclear safety are:

- SÚJB, which is the Central Governmental Body entrusted with the executive and regulatory powers in the area of peaceful utilization of nuclear energy and ionizing radiation.
- Government, which among others appoints (and removes) the Chairman of the SÚJB. It plays an important coordination role in the crisis management (together with ministries and other central administrative bodies, regional bodies and other authorities with jurisdiction in the region, the municipal authorities with extended powers and municipality authorities).

- Ministry of Industry and Trade, which is, according to the Building Act, entrusted with the power to issue permits for certain types of nuclear installations (Article 16 para 2 letter d) ).
- Ministry of Regional Development, which is, according to the Building Act, entrusted with the power to issue permits for certain types of nuclear installations (Article 13 para 2 of the Building Act).
- Ministry of Interior, which is, among others, responsible for the interior order and security, fire protection and other issues covered by the emergency acts.
- Ministry of Environment, which is, among others, responsible for the environmental impact assessment proceedings.
- Ministry of Labour and Social Affairs, which is responsible, inter alia, for the occupational health and safety.
- Ministry of Health, which creates a system of special medical care provided by selected clinics to persons irradiated during radiation incidents.
- Ministry of Finance, which is the administrator of the nuclear account (used for financing of activities related to safe disposal of radioactive waste).
- SÚRAO (Radioactive Waste Repository Authority), which is a state organization (established by the Ministry of Industry and Trade – based on Article 113 para 1 of the Atomic Act) entrusted with the task of ensuring safe disposal of radioactive waste in the Czech Republic in compliance with the requirements of nuclear safety and human and environmental protection.

### **2.1.2 Regulatory Framework**

The legal provisions governing regulatory framework in inspections matters are mainly the Atomic Act (Articles 200 to 203; in the past Articles 39 to 42 of the Act No. 18/1997 Coll.), the Inspection Code and the Administrative Code.

The SÚJB performs the checks of compliance with the Atomic Act, regulations issued to implement this Act, commitments arising from international treaties binding on the Czech Republic applicable to the peaceful use of nuclear energy and ionizing radiation, and decisions issued on the basis of this Act. SÚJB staffs responsible for inspections are inspectors (inspectors are civil servants according to the Act No. 234/2014 Coll. and thus must fulfil stipulated requirements, such as competency, qualification, examinations).

In case of violation of the legal provisions, the inspectors are empowered to issue binding orders, i. e. to prohibit (until a remedy is ensured) certain activities with possible impact on nuclear safety or to seize radioactive waste or ionizing radiation source. Moreover, the SÚJB is authorized to issue corrective measures, to remedy a deficiency in the activities of persons performing activities related to the use of nuclear energy or activities in exposure situations. The SÚJB may also impose penalties and collect them, however, they are not enforced by the SÚJB itself, but customs authorities are entrusted with the power to enforce them.

The results of the inspections are contained in the Inspection reports. The inspected party may file objections against the inspection findings. The inspected party may also use appeals and extraordinary remedies against the decisions issued by the SÚJB. The obliged party has also right – under specified conditions – to appeal to an administrative court (and in strictly defined cases to the Constitution court).

#### **Article 4.1 (a) - The allocation of responsibilities and coordination between relevant state bodies**

Division of responsibilities and coordination among relevant state authorities is regulated mainly by the Atomic Act and by the Act No. 2/1969 Coll., on establishment of Ministries and other bodies of central government of the Czech Republic, as amended. Key responsibility for nuclear safety among state administrative bodies holds the SÚJB. The office is established based on article 2 para 1 point 7 of the Act No. 2/1969 Coll. as one of the Central Governmental Bodies. Its powers and responsibilities

are comparable to those provided to ministries and it is a central administrative Authority for the area of use of nuclear energy and ionizing radiation. Its seat lies in Prague. The head of the SÚJB is a chairperson, which is designated and recalled by the Government. The Act No. 234/2014 Coll. regulates selection, designation and recalling of the chairperson.

The Atomic Act (article 210 to 225) provides particular functions in the area of use of nuclear energy and ionizing radiation also to other authorities, mainly to the central administrative bodies, including ministries, namely:

- the Government,
- the Ministry of Industry and Trade,
- the Ministry of the Interior,
- the Ministry of Health,
- the Ministry of Finance,
- the Ministry of Defence,
- the Ministry of Foreign Affairs,
- the Ministry of Agriculture,
- the Ministry of the Environment,
- the Ministry of Regional Development,
- the Fire Rescue Service of the Czech Republic,
- the Police of the Czech Republic,
- bodies of the Customs Administration of the Czech Republic,
- the Czech Agriculture and Food Inspection Authority,
- regional offices and presidents of regions, and
- Municipal offices of municipalities with extended authorities.

However, responsibilities of aforementioned authorities are limited to specific topics, related to their main field of activity and regulatory purpose. For instance, the Ministry of Industry and Trade draws up the concept of the National strategy (policy) for radioactive waste and spent fuel management. The Ministry of the Interior issues binding opinions on the SÚJB's decisions on the design basis threat and cooperates with the SÚJB in drawing up the national radiation extraordinary event plan and the Fire Rescue Service of the Czech Republic, which among others lays down the requirements for fire protection of nuclear installations.

In general and according to the Act No. 2/1969 Coll., ministries and other central administrative bodies, including the SÚJB, fulfill under their competency tasks set in acts and other generally binding legislation and tasks resulting from the membership of the Czech Republic in European Union and in other integrational structures and international organizations, if binding for the Czech Republic. They analyze societal issues in their competences; analyze reached results and takes measures to solve actual problems. They elaborate conceptions of development in their field of activity and of solving the crucial questions, which they submit to the Government of the Czech Republic for approval. They inform the public on proposals of serious measures. Ministries and other central administrative bodies, including the SÚJB, take care of regulation on matters belonging to their competency portfolio. They elaborate bills of laws and other legal instruments based on their general responsibilities or based on tasks imposed to them by the Government. They take care of preserving legality within a scope of their competencies and take necessary remedial measures in accordance with laws.

The Government (article 28 of the Act No. 2 /1969 Coll.) plays general coordinating and managing role. Specific coordinating role is born by the SÚJB on particular issues, as specified by the Atomic Act (e.g. in emergency planning according to Article 211).

#### Article 4.1 (b) - National nuclear safety requirements

The nuclear safety requirements are incorporated in the Czech Republic in the Atomic Act, its supplementing Decrees, and Government Regulations. These legal instruments are accompanied by legally non-binding Recommendations and Guides published by the SÚJB.

Constitution of the Czech Republic stipulates in Article 15 that the legislative power is in the Czech Republic vested to the Parliament. Article 41 of the Constitution enumerates entities empowered to submit bills of laws to the Parliament. These entities include a Parliament Deputy, a group of Deputies, the Senate, the Government, or the representative body of a superior self-governing territorial unit.

The process of preparation and adoption of legislative acts (laws, decrees, government regulations etc.) is, at the governmental level, regulated by the Government Legislative Rules (approved by the Governmental Resolution No. 188/1998 Coll., as amended).

#### *Laws*

According to the abovementioned Rules the ministries and central governmental bodies prepare, in their area of responsibility, firstly a document called “factual objectives of the law”, where the aim and impacts of the respective law are described, and if approved, the laws themselves.

The SÚJB, as a central governmental body, prepares a bill of law in its field of competence and submits it to the intra-governmental consultations where all ministries, central governmental bodies, the Government Office and other relevant subjects are represented. Once the final text of the bill is agreed between all interested parties and approved by the Government, it is submitted for the approval to the Parliament (firstly to the Chamber of Deputies, secondly to the Senate) and followingly to the President of the Czech Republic. As soon as the law is signed by the Chairman of the Chamber of Deputies, the President of the Republic and the Prime Minister it is published in the Collection of Laws. On the day of its publication it becomes a valid part of the Czech legal order (laws enter into force/take effect either on a day stipulated in the law itself or on the 1<sup>st</sup> January or on the 1<sup>st</sup> July of the year).

All nuclear safety requirements covering all stages of the lifecycle of nuclear installations are currently included in the Atomic Act (its chapters I, II, IV and VIII mainly).

#### *Decrees, Government Regulations*

The provisions of laws may be further specified via implementing regulations – Decrees and Government Regulations. The Government does not need to be empowered to issue implementing regulations by the laws themselves, its power to adopt Government Regulations is derived directly from the Constitution. The SÚJB and other central administrative bodies, however, need such enabling provisions in order to be authorized to issue implementing decrees.

The Atomic Act authorizes the SÚJB, and in strictly defined cases other bodies of the state administration, to issue implementing decrees to further specify the provisions of the Atomic Act (by articles 236 and 237). SÚJB’s Decrees are prepared by the SÚJB and are submitted to the intra-governmental consultations. Once the text is agreed, it is signed by the Chairperson of the SÚJB and published in the Collection of Laws. In case of decrees issued by other central administrative bodies the process follows the same rules.

The Government Regulations in the area of nuclear safety are also prepared by the SÚJB and submitted to the intra-governmental consultations. Once all the objections raised are satisfactorily settled, the final text is approved by the Government, signed by the Prime Minister and published in the Collection of Laws.

Legal effects of the publication of decrees and government regulations in the Collection of Laws and the rules for their entry into force are the same as the ones described above.

All nuclear safety requirements covering all stages of the lifecycle of nuclear installations are currently included mainly in following implementing regulations:

- Decree No. 358/2016 Coll., on requirements for assurance of quality and technical safety and assessment and verification of conformity of selected equipment;
- Decree No. 359/2016 Coll., on details of ensuring radiation extraordinary event management;



- Decree No. 377/2016 Coll., on the requirements for the safe management of radioactive waste and on the decommissioning of nuclear installations or category III or IV workplaces;
- Decree No. 378/2016 Coll., on siting of a nuclear installation;
- Decree No. 379/2016 Coll., concerning the approval of some products in the field of peaceful use of nuclear energy and ionizing radiation and the carriage of radioactive or fissile material;
- Decree No. 408/2016 Coll., on management system requirements;
- Decree No. 409/2016 Coll., on activities especially important from nuclear safety and radiation protection viewpoint, special professional qualification and training of persons ensuring radiation protection of the registrant;
- Decree No. 422/2016 Coll., on radiation protection and security of a radioactive source;
- Decree No. 464/2016 Coll., on the procedure for providing subsidies from the state budget for the adoption of measures to reduce the level of radiation from the presence of radon and its transformation products in the indoor air of buildings for housing and public residence and for the adoption of measures to reduce the content of natural radionuclides in drinking water;
- Decree No. 21/2017 Coll., on nuclear safety assurance at nuclear installations;
- Government Regulation No. 35/2017 Coll., which sets the rate of a one-time fee for the disposal of radioactive waste and the amount of contributions from the nuclear account to municipalities and the rules for their provision;
- Decree No. 162/2017 Coll., on the requirements for nuclear safety assessment;
- Decree No. 329/2017 Coll., on the requirements for nuclear installation design;
- Decree No. 266/2019 Coll., on policy for radioactive waste management and spent fuel management;
- Decree No. 250/2020 Coll., on the method of establishing a reserve for the decommissioning of a nuclear installation and category III and category IV workplace.

*Guides and Recommendations* related to the area of nuclear safety and radiation protection are not legally binding, but their observance helps stakeholders to implement the legal requirements into practice. They are prepared and published (on the SÚJB website and some of them also in a paper form) in order to help the addressees of the legal provisions to comply with the legislation and to reach a “good practice”.

Article 4.1 (c) - Licensing and prohibition of operation

### **2.1.3 Legal provisions to prevent the operation of nuclear installation without a valid license**

According to Article 9 para 1 of the Atomic Act the following activities can be performed only after receiving a license:

- the siting of a nuclear installation,
- the construction of a nuclear installation,
- the first physical start-up of a nuclear installation with a nuclear reactor,
- the first power-generation start-up of a nuclear installation with a nuclear reactor,
- the commissioning of a nuclear installation without a nuclear reactor,
- the operation of a nuclear installation,
- the individual phases of decommissioning of a nuclear installation, and
- the carrying out of modifications affecting nuclear safety, technical safety and physical protection of a nuclear installation.

Similar system of licensing of nuclear installation was already enacted by the Act No. 18/1997 Coll.

As stated in Article 208 letter a) of the Atomic Act the SÚJB is the competent authority authorized to issue licenses to perform those activities (formerly by Article 3 para 2 letter c) of the Act No. 18/1997 Coll.).

Article 189 para 1 letter a) of the Atomic Act provides for a penalty for breaching the legal obligation to perform the above-mentioned activities only after receiving the necessary license. In those cases, the SÚJB is entitled to impose penalties up to 100 million CZK. Similar punishment introduced also the older Act No. 18/1997 Coll., at the level of up to 50 million CZK.

## **2.1.4 A description of the licensing process and system**

### *2.1.4.1 General description*

The Atomic Act requires (Art. 13 to 14; former Act No. 18/1997 Coll. Art. 10 to 12) the applicant to have a legal capacity to act, to be of a good reputation and professionally competent. Only those applicants are entitled, after complying with other legal obligations, to receive a license to perform activities mentioned above.

Art. 5 and 16 of the Atomic Act (Art. 4 and 13 of former Act No. 18/1997 Coll.) define the obligations which the applicant and its application must fulfil in order to be considered by the SÚJB. The applicant must, among others, submit safety demonstration to the SÚJB for review and assessment. The Atomic Act in its Appendix 1 provides for a documentation which must be submitted for review and assessment to the SÚJB together with the application.

In the administrative proceedings leading to the issuance of a license, the SÚJB proceeds independently of the proceedings of any other administrative body. The decision which grants the applicant the license to perform the activities in the area of nuclear safety is taken only after establishing that the applicant fulfils all the obligations stipulated in the Atomic Act as well as in the relevant implementing regulations.

### *Appeal procedure, judicial protection*

The applicant may challenge the SÚJB decision according to the appeal procedures described in the Administrative Procedure Code. He may also apply for judicial protection providing the conditions of the Act No. 150/2002 Coll., Code of Administrative Justice, are fulfilled.

### *2.1.4.2 Specific description*

The main stages of the licensing process of NPPs are as follows: siting, construction, commissioning (divided into two phases - the first physical start-up and the the first power-generation start-up; it differs from the nuclear installations without reactor which have only one phase of commissioning), operation and decommissioning.

Prior to the site license proceedings based on the Atomic Act or in parallel with it the environmental impact assessment process (according to the Act No. 100/2001 Coll.) must be completed by the Ministry of Environment. The licensing of the site is primarily focused on assessment and evaluation of site characteristics and site compliance with the criteria set up in Decree No. 378/2016 Coll. (formerly No. 215/1997 Coll.). The Decree contains both, exclusion criteria (e.g. seismicity of the site) which prevent the issuance of a positive license as well as conditioning criteria which allow proceeding when defined conditions are fulfilled. However, this process also includes preliminary assessment and evaluation of the design concept of the planned NPP and preliminary concepts of the radiation protection (radiation protection of workers at the NPP, public and environment), waste and spent fuel management, decommissioning, security, management system and emergency planning. Information and data relevant to NPP siting and safety demonstration and justification are submitted by the

applicant to the SÚJB for evaluation in a form the documentation to be provided with the application, namely:

- management system programme,
- initial safety report,
- analysis of physical protection assurance needs and possibilities,
- intention to ensure the monitoring of discharges from the nuclear installation,
- monitoring programme,
- intention to ensure radiation extraordinary event management,
- draft concept for the safe decommissioning,
- description of the method of quality assurance for the preparation of construction project implementation,
- principles of quality assurance for the subsequent phases of the nuclear installation's life cycle.

The licensing of the NPP construction is focused on design evaluation; specifically on whether there is enough evidence that the proposed design meets all requirements for nuclear safety, radiation protection and emergency management as set up by Decree No. 329/2017 Coll. (formerly No. 195/1999 Coll.), Decree No. 422/2016 Coll. (formerly No. 307/2002 Coll.) and Decree No. 359/2016 Coll. The design evaluation includes transients and accidents analyses too, as required by the Decree No. 162/2017 Coll. Construction licensing process also includes independent evaluation of radioactive waste and spent nuclear fuel generation and management (Decree No. 377/2016 Coll.), physical protection (Decree No. 361/2016 Coll.; formerly No. 144/1997 Coll.), evaluation of the concept of NPP decommissioning (Decree No. 377/2016 Coll.; formerly No. 185/2003 Coll.) and evaluation of the management system (Decree No. 408/2016 Coll.; formerly No. 132/2008 Coll.). Information and data relevant to NPP construction and safety demonstration and justification are submitted by the applicant to the SÚJB for evaluation in the form of the documentation to be provided with the application, namely:

- management system programme,
- limits and conditions,
- programme of controls for the construction phase,
- preliminary safety report,
- list of selected equipment, including classification of selected equipment into safety classes,
- list of activities relevant to nuclear safety and description of the system of education, training and exercises for the personnel, including a description of the qualifications of the personnel,
- description of the system of training for selected workers,
- programme of construction of the nuclear installation, including the timetable,
- preliminary commissioning plan for the nuclear installation,
- preliminary probabilistic safety assessment,
- preliminary physical protection assurance plan,
- concept for the safe permanent shutdown of the installation to be licensed, including the method of the radioactive waste management produced,
- monitoring programme,
- radiation extraordinary event analysis and assessment for the period from the commencement of construction of the nuclear installation to the commencement of decommissioning,
- on-site emergency plan,
- establishment of the emergency planning zone,
- preliminary controlled ageing programme,
- proof that the financing of the radioactive waste management has been secured, if such waste is generated,
- evaluation of quality assurance for the preparation of the construction of the nuclear installation,
- description of the method of quality assurance for construction project implementation,

- principles of quality assurance for the phases of the nuclear installation's life cycle following construction.

The licensing of the NPP commissioning and operation is focused on evaluation of the readiness of the NPP and the personnel for tests performed before the first nuclear fuel loading into reactor, for the fuel loading into reactor, for the tests carried out with the nuclear fuel in the reactor and for the operation. The SÚJB evaluation of the relevance and completeness of the tests and the SÚJB independent assessment of safety is carried out based on reviewing the updated documentation to be provided with the application, namely:

- management system programme,
- limits and conditions,
- programme of operational controls,
- operating safety report,
- list of selected equipment, including classification of selected equipment into safety classes,
- neutron-physical characteristics of the nuclear reactor's active zone,
- list of activities relevant to nuclear safety and description of the system of education, training and exercises for the personnel, including a description of the qualifications of the personnel,
- description of the system of training for selected workers,
- certificate of readiness of the installation, personnel and internal regulations for the operation of the nuclear installation,
- evaluation of the results of the first power-generation start-up of a nuclear installation with a nuclear reactor,
- evaluation of the results of trial operation if this is the first license for the operation of a nuclear installation,
- operational programme, including the timetable,
- probabilistic safety assessment,
- physical protection assurance plan,
- decommissioning plan,
- estimation of decommissioning costs,
- operational controlled ageing programme,
- document demonstrating that safe radioactive waste management has been ensured, including the financing thereof, if radioactive waste is generated,
- emergency operating rules,
- severe accident management guidelines.

The license for operation is granted for an unlimited period. To ensure that the applicant keeps state of nuclear safety of operated nuclear facility as high as possible the Atomic Act and Decree No. 162/2017 Coll. include requirements for comprehensive periodic safety review every ten years. Moreover, both regulations require the facility's operator to perform continuous safety assessment.

For decommissioning purposes the holder of the license for commissioning and operation is obligated to create continually a provision so that monetary funds deposited on a special account are available for the preparation and process of decommissioning at the required time and in the amounts in agreement with the decommissioning proposal verified by SÚRAO and approved by the SÚJB (Art. 51 para 2 to 5 and following articles of the Atomic Act).

For all others nuclear facilities defined by Atomic Act all the life cycle stages requirements and proceeding mentioned above are identical as for NPPs, except for commissioning in case of the installations without reactor, utilizing graded approach i.e. evaluation is scaled to risks posed by research or other facility. Also, all experiments and possible modifications are assessed, evaluated and approved by the same procedures as for NPP, only the scope of proofs is appropriate to the type of

the nuclear installation to be assessed according to graded approach. Graded approach is explicitly defined by Article 5 para 8 of the Atomic Act.

The SÚJB is the respective authority protecting the public interest pursuant to special act (as stated in Article 4 para 2 of the Building Code). The building authorities (which are for the nuclear installations Ministry of Industry and Trade and Ministry of Regional Development) thus need to proceed in mutual cooperation with the SÚJB when granting permits for nuclear installations according to Building Code. None of the permits according to the Building Code can be issued without the binding statement from the SÚJB which should reflect nuclear safety interests and requirements (Art. 208 letter q) of the Atomic Act).

Article 4.1 (d) – Regulatory control

### **2.1.5 Nuclear safety supervision**

According to Article 200 of the Atomic Act the SÚJB conducts inspections of compliance with this Act, regulations issued to implement this Act, commitments arising from international treaties binding on the Czech Republic applicable to the peaceful use of nuclear energy and ionizing radiation, and decisions issued on the basis of this Act, and inspections of the performance of the obligations laid down in the metrology act as regards measuring instruments intended or used for measuring ionizing radiation and radioactive substances. Similar responsibility was included in Article 3 para 2 of the Act No. 18/1997 Coll.

#### *2.1.5.1 Assessment*

The assessment is an important part of the SÚJB supervisory activity. The SÚJB assesses the level of nuclear safety in the course of administrative procedures to issue licenses for activities specified in the Atomic Act. Nuclear and radiation safety requirements are defined individually for every activity subject to a license in the Atomic Act and in relevant decrees. Fulfilment of them is to be proved in the documentation which is to be submitted by the licensee, and continually updated and re-submitted through the life cycle of the facility (during the term of the licensed activity), as required by Article 24 para 4 of the Atomic Act.

In the context of the aforementioned, the SÚJB regularly assesses the level of nuclear safety assurance within the following activities:

- assessment of the periodically submitted Final Safety Analysis Report,
- evaluation of the In-service Inspections Program,
- evaluation of ageing management programmes,
- evaluation of proofs of readiness of nuclear installations safety related systems and staff for further operation,
- evaluation of the program for the enhancement of nuclear installation safety,
- evaluation of feedback from the operational experience and implementation of the latest scientific knowledge and technology.

In agreement with the Atomic Act, all results obtained by the SÚJB in the area of nuclear safety verification and assessment are submitted to the Government on an annual basis. The results are also made available to the general public.

The main tool for the evaluation of nuclear safety is the Periodic Safety Review. It is based on submitted documentation, mainly updated Safety Report. It takes place in all nuclear installations with the

periodicity of 10 years and is performed on a basis of the Decree No. 162/2017 Coll. and fully according to technical IAEA requirements and guides.

### 2.1.5.2 Inspections

The verifications are carried out in the form of inspections performed by SÚJB inspectors. The legal framework governing the performance of inspections is formed mainly by Articles 200 to 203 of the Atomic Act (formerly Articles 17, 39 and 40 of the Act No. 18/1997 Coll.), the Inspection Code and the Administrative Code. Those Acts regulate the process of inspections, lay down rights and obligations of inspectors and inspected parties during the performance of inspection activities. Inspections cover all areas of the SÚJB scope of competence, in the area of nuclear safety inspectors check mainly whether subjects that obtained a license in accordance with Article 9 para 1 comply with the requirements of the Atomic Act, relevant implementing regulations, and whether they comply with the conditions specified in the license.

Article 200 of the Atomic Act defines the subject matter of the inspections. Article 201 stipulates that the inspection activities are carried out by SÚJB inspectors. Article 203 establishes the authority of the inspectors to impose on-site binding orders (to temporarily stop the activity or to seize the ionizing radiation source or RAW) and Article 204 empowers the SÚJB to require that remedial measures are adopted within established deadlines. Requirements which need to be fulfilled by a person to become an inspector are regulated by the Act No. 234/2014 Coll. and its implementing regulations (e.g. qualification, exams, probity etc.).

Articles 200 to 204 are *lex specialis* towards the general legal act governing the inspection activities - the Inspection Code. Rules laid down in the Inspection Code for commencement of the inspections, collecting samples, access to lands, buildings and other premises, inspection reports and objections against them, inspectors' and inspected parties' rights and duties etc. are applicable also for inspections performed by the SÚJB inspectors.

There are different forms of inspection activities performed by the SÚJB:

- routine inspections and planned specialized inspections (those are inspections anticipated in an internal SÚJB document called the "Plan of the inspection activities", which is prepared for a calendar year and made publicly available in accordance with Article 202 para 2 of the Atomic Act),
- inspections responding to a particular situation (so-called "ad-hoc" inspections).

The routine inspections should cover all regular important activities performed by the licensee, especially the compliance with the Limits and Conditions for safe operation (which is a document approved by the SÚJB according to Article 24 para 3 of the Atomic Act). The plan for routine inspections is developed based on the plans for operation, requirements of Limits and Conditions and requirements in the operating procedures; the inspections are performed on daily, weekly and quarterly bases. Results of the routine inspections are usually evaluated once a month. The evaluation activity is documented in monthly reports and discussed with the licensee.

In the case of the planned specialized inspections, a regular semi-annual plan is developed based on:

- evaluated results of the inspections performed during a previous period;
- plan of the nuclear installation operation;
- evaluation and conclusions of routine inspections;
- conclusions of SÚJB assessment effort;
- independent analyses, findings from safety analyses.

The inspections are usually carried out by a team of inspectors made up of resident inspectors and inspectors from the SÚJB Headquarters. The so-called "ad-hoc" inspections are performed to examine events and failures with possible impact on nuclear safety, as well as to clarify serious findings from the routine or planned inspections.

The SÚJB also performs inspections focused on activities of licensee suppliers of services, products and their management system.

## **2.1.6 Relevant bodies for the nuclear safety supervision system**

### *2.1.6.1 Regulatory authority*

Roles and Responsibilities of the SÚJB are described below in 3.1.2.

### *2.1.6.2 TSO*

The SÚJB utilizes technical support from organizations specialized in topics relevant to nuclear and radiation safety. These are e.g. the State Institute for Radiation Protection (SÚRO), which is a public research institution providing professional and technical support to the SÚJB in the field of radiation protection and nuclear safety, or the National Institute for Nuclear, Chemical and Biological Protection (SÚJCHBO).

Close cooperation has been established in the area of site evaluation with the Institute of Geology of the Academy of Science of the Czech Republic and the Geological Services, which are subordinated to the Ministry of Environment.

### *2.1.6.3 Other organizations*

It is the license holder who is primarily responsible for the nuclear safety, as stipulates Article 5 para 2 letter a) and para 4 of the Atomic Act. In this regard it is expected that the license holder ensures regular checks during installation, commissioning and operation stages of the nuclear installation by an accredited expert team as well as audits of license holder's contractors (including designers and manufacturers) and internal organizational audits. In addition, design, manufacturing and installation of classified equipment specifically defined by the Decree No. 358/2016 Coll. (previously No. 309/2005 Coll.) need to be checked by independent authorized persons and/or other independent subjects.

## **Article 4.1 (e) – Enforcement**

In case of deficiencies identified during the inspection activities the inspectors have power to impose so called “binding orders”, based on Article 203 of the Atomic Act. An inspector may, based on the performed inspection, prohibit until a remedy is ensured

- management of nuclear material or other source of ionizing radiation,
- discharge of radioactive substance from a workplace,
- the provision of services in the controlled area to the operator of a category IV workplace,
- radioactive waste management,
- carriage of radioactive and fissile materials,
- performing activities of particular relevance to nuclear safety and radiation protection, or
- using, manufacturing, import or distribution of a product, if it was not approved by the SÚJB, even though it should be approved according to this Act, and also if the said activities are not performed in compliance with the requirements of this Act. Moreover, an inspector has a right to order seizure of radioactive waste or ionizing radiation source if unauthorized radioactive waste management or nuclear material or other ionizing radiation source is revealed. The inspector shall impose the binding order orally to the inspected person or to other person present on the site of the inspection with effects to the inspected person and make an official record on the binding order. The SÚJB can

revoke the binding order if demonstrated by the inspected person that the management of the object is authorized.

SÚJB is entitled (as stated in Article 204 of the Atomic Act) to require any person performing activities related to the use of nuclear energy or activities in exposure situations to remedy the situation (i.e. not only an inspected person), within a set period of time. The persons on whom corrective measures have been imposed must immediately notify the SÚJB of the method of implementation of the imposed measures. The SÚJB response to identified deficiencies is supposed to correspond to the seriousness of a situation. All findings of non-compliances have to be precisely described in the inspection report. Inspectors may solve minor deficiencies within the course of the inspections themselves.

When further enforcement actions are needed the SÚJB proceeds in accordance with the Administrative Procedure Code (Article 61 - the institute of provisional measures - or Article 150 – issuance of Order when the factual findings are sufficient - may be applied) and issues a decision imposing a penalty for a breach of the identified obligation. Articles 175 to 199 of the Atomic Act specify the obligations the breach of which may lead to penalties specified therein (the amount of the penalty is supposed to reflect the seriousness, significance and time period of the illegal activity and the extent of consequences that were caused, as well as early and efficient co-operation in removing the deficiencies). The penalties are collected by the SÚJB itself, however, it is the customs authorities that are authorized to enforce them in case that they are not paid voluntarily.

Moreover, Article 22 para 6 of the Atomic Act stipulates that the SÚJB may cancel the license if the license holder seriously fails in his or her obligations under this Act or fails to remedy serious deficiencies in the activities found by the SÚJB, or the license holder no longer satisfies the conditions relevant for the issue of the license.

Any decision issued by the SÚJB may be challenged according to an “appeal procedure”. The “appeal procedure” for the decisions issued by the central government authority is regulated by Article 152 of the Administrative Procedure Code. The appeal decision is taken by the Chairperson of the SÚJB based on the draft decision presented to her or him by an “appeal committee” (where majority of members are specialists not employed by the SÚJB). The obliged party may also apply for judicial protection (after exhausting ordinary remedies) according to the Act No. 150/2002 Coll., Code of Administrative Justice (Article 65 stipulates that anyone who claims that their rights have been prejudiced directly or due to the violation of their rights in the preceding proceedings by an act of an administrative authority whereby the person’s rights or obligations are created, changed, nullified or bindingly determined may seek the cancellation of such a decision, or the declaration of its nullity, unless otherwise provided). In the utmost case, it is possible to require protection by presenting a constitutional complaint to the Constitutional Court.

Article 4.2 – Maintaining and improving national framework

### **2.1.7 Arrangements ensuring that national framework is maintained and improved**

In general, according to Article 24 of the Act No. 2/1969 Coll. the SÚJB (but also other central administrative bodies) takes care of suitable regulation of matters belonging among competences of the Czech Republic; elaborates bills of laws and other legal acts regarding matters belonging among their competences and drafts which preparation was imposed to it by the Government. The SÚJB takes care of preserving legality within a scope of its competences and takes necessary remedial measures in accordance with laws.



### 2.1.7.1 Sources for improvements

#### *Activities performed by the licensees*

According to the provisions of Article 25 para 1 letter c) of the Atomic Act, the licensee is obliged to assess nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security within the scope of applicable requirements, including aspects of the current level of science and technology. According to Article 49 para 1 letter d) and e) of the Atomic Act the licensee is obliged to conduct safety assessment and based on the safety assessment, constantly increase the level of nuclear safety as far as reasonably practicable. The changes in the licensed activity must be documented. The scope of the documentation is specified in the Appendix 1 to the Atomic Act and its content is enacted in the decrees to the Atomic Act. Documentation and safety assessment are, in compliance with the Atomic Act, reviewed by the SÚJB, both analytically and within its inspection activities.

The operating experience feed-back mechanism is regulated by the Decree No. 21/2017 Coll. and in one of SÚJB Safety Guides (Safety Guide 1. 1 Operating experience feed-back mechanism at the NPPs).

#### *International Peer Review*

Outputs from the international peer review program of the IAEA, OECD-NEA and WANO carried out by both the license holders and regulatory body serve as important sources for enhancing nuclear safety. The legal basis for the peer reviews is provided by Article 208 letter k) of the Atomic Act setting down the SÚJB's responsibility to ensure international cooperation within the field of its competence, provide information from the field of its competence to the International Atomic Energy Agency, the Euratom and other authorities of the Euratom and ensure implementation of other obligations arising from Euratom legislation relating to, in particular, the national and international evaluation of the exercise of State Authority over nuclear safety of nuclear installations and management of nuclear materials and high-activity sources. For the licensee, the obligation to conduct a special safety assessment related to peer review is imposed by Article 48 para 3 letter c) of the Atomic Act.

#### *IAEA*

The Czech Republic regularly invites international missions of the IAEA. In the case of NPP these are the following types of missions: OSART, ASSET, SALTO, IPERS, Safety Issues, IPPAS, Site SR Design, LBB assessment, Fire Safety, PSA and Seismic SBSA.

Dukovany NPP has hosted in total 14, Temelín NPP 24 and ČEZ Company 1 IAEA mission.

The IAEA conducted the Integrated Regulatory Review Service (IRRS) mission to review the regulatory framework for nuclear and radiation safety in the Czech Republic at the request of the Czech Government from 18 to 29 November 2013. The IRRS team confirmed that

- the Czech regulatory system for nuclear and radiation safety is robust;
- the SÚJB is an effective and independent regulatory authority;
- the Czech Republic actively participates in the global safety regime.

For more information including recommendations, suggestions and good practices identified during the mission, please refer to the full version of the Report [5] at:

[https://www.sujb.cz/fileadmin/sujb/docs/zpravy/IRRS\\_Czech\\_Republic\\_Final\\_Report.pdf](https://www.sujb.cz/fileadmin/sujb/docs/zpravy/IRRS_Czech_Republic_Final_Report.pdf).

The IRRS follow-up mission was conducted in 2017 and confirmed good status of the Czech regulatory system, even improved by a new nuclear law. IRRS follow-up mission report is available here:

[https://www.sujb.cz/fileadmin/sujb/docs/aktualne/Mise-IRRS/IRRS\\_Follow-up\\_Czech\\_Republic\\_Report.pdf](https://www.sujb.cz/fileadmin/sujb/docs/aktualne/Mise-IRRS/IRRS_Follow-up_Czech_Republic_Report.pdf)

## WANO

ČEZ, a. s., as an active member of WANO, regularly invites the international program of partner inspections (WANO Peer Review - WPR). These inspections are performed by international expert teams from various professional organizations and nuclear power plants operated in other countries and cover 10 standard areas (Organisational Effectiveness, Operations, Maintenance, Engineering, Operating Experience, Radiological Protection, Chemistry, Training, Fire Protection, Emergency Preparedness). The program of partner inspections supposes one WPR in 4 years at each NPP and after two years a subsequent or other independent inspection.

ČEZ employees also participate in this program in international teams visiting other NPPs. Such participation contributes to the transfer of know-how, safety benchmarking and the enhancement of the safety level in the world.

The first WANO Peer Review at Dukovany NPP took place in 1997, the second WPR mission in 2007, with the follow up mission in January 2009. The third WPR mission took place in 2012. The missions confirmed a high level of safety of operation of Dukovany NPP. The follow-up inspections confirmed that all recommendations for improvements had been implemented or were in a high stage of completion.

The first WANO Peer Review at Temelín NPP took place in 2004 with a follow-up mission in 2006. The second WPR mission at Temelín NPP took place in 2011 with a follow-up mission in 2013. In the Temelín NPP, WPR appreciated the high professionalism of the staff and the achieved safety level of the power plant.

The next WANO Peer Review is planned in Dukovany NPP for the autumn 2014 (follow-up mission), and in the Temelín NPP for 2015.

## *EU Stress Tests*

Stress Tests under the initiative of the European Commission in response to the Fukushima nuclear power plant accident were executed at both nuclear power plants – Temelín NPP and Dukovany NPP in 2011. The NPP evaluation was focused on extreme natural events seriously endangering safety functions and leading to severe accidents. The Stress Tests identified organizational and technical measures for further improvement of resistance of both power plants against extreme external interference. Such potential measures are currently further analyzed in terms of efficiency. As a result of the conclusions of the Stress Tests, the national action plan for improving nuclear safety of nuclear installations in the Czech Republic was completed on 31 December 2012. Any measures of a technical nature modifying existing power plant designs need to be further analyzed as regards their feasibility. Based on their results specific actions should be proposed. Those need to be approved by the SÚJB before their implementation. Details of the "stress tests" analysis are given in [4] and [6].

## *International recommendations and technical standards*

An important source of the recommendations are publications of the IAEA, in particular the Safety Series: TECDOCs, Safety Fundamentals, Safety Requirements, Safety Guides, INSAG reports including information data bases, e.g. AIRS - Advanced Incident Reporting system database, OSMIR – OSART Mission Results databases, etc.

Another external source of information is WANO, providing a number of products, contributing to the increase of the safety and effectiveness of NPP operation: Guidelines, Performance Objectives and Criteria, Just-in-Time, lessons learned from events (Significant Event Reports/Significant Operating Experience Reports), methodology of Self-Assessment, Excellence in Human Performance, Operating Decision Making (ODM), Hot Topics, etc.

The SÚJB evaluates Final Reports from PSRs of the individual facilities, issues positions on the PSR findings and on the list and completeness of corrective measures and, periodically, at the end of each year of operation, reviews the fulfillment of the schedule and content of the corrective measures. It also discusses with the licensee any potential changes in the schedule for the performance of corrective measures and approves adopted technical and administrative measures.

#### *International operating experience feedback*

The sources used by the SÚJB for collecting information on operating and regulatory experience are IAEA IRS and INES reports, WGOE (OECD/NEA), EU Clearinghouse on NPP operating experience, IAEA publications, Convention reports, information given at international seminars and conferences. A group of inspectors have been assigned to analyze the information from the different sources. The SÚJB has its own database in which national events are recorded, and provides Czech input to the international IAEA/NEA incident reporting system (IRS).

NPPs in the Czech Republic are involved in the international system of sharing operational experience (IAEA, WANO). In parallel with this, they are orientated on and have direct contacts first of all with identical types of nuclear power plants in Slovakia, Hungary, Finland, Ukraine and Russia. Besides this, the ČEZ, a.s. experts participate in the work of working groups of other professional organizations, such as e.g. EUR, ENISS, ENC, FORATOM, Eurelectric, WNA, EPRI etc.

The main task of this co-operation is the transfer and utilization of operational experience and technical information of nuclear power plant operators in practice of both NPPs in the Czech Republic. Selected important information about events at other nuclear facilities and international experience from sources like WANO, IAEA, event. INPO, etc., are monitored and included into the program of the Event Committee, meetings of the Production division director, meetings of NPP Dukovany and Temelín management (and subsequently departments), Committee for Safety of the Production Division, and Committee for Safety of NPP Dukovany and Temelín.

The most important experience with a possible impact on the operation or safety of the nuclear power plants is implemented in the form of corrective measures. These focus first of all on the training of personnel, maintenance and improving inspection activities. All the acquired information on external events is stored in the database supported by special software, and these are utilized by the specialists of individual departments as technical support in dealing with problems. The staff concerned is directly informed of the most important events on the foreign power plants on the training days. The tasks and measures resulting from these events are implemented and their effectiveness is evaluated. Safety events and operational experience from non-nuclear operations of ČEZ, a. s., are transmitted at NPPs Dukovany and Temelín in a standard working way of communication inside ČEZ, a. s.

Vice versa, the operational experience of Dukovany and Temelín NPPs is handed over to other NPP operators either by direct contact or by elaborating 4 to 6 detailed reports annually on the most important events with analyses of their root causes. These reports are then included into the international WANO network, or they are submitted to the SÚJB for distribution via the Incident Reporting System (IRS) network of the IAEA.

#### *2.1.7.2 Improvements of the legislative framework*

Based on all those sources mentioned above, improvements are made also in the legislative sphere. The status of compliance of the Atomic Act and its implementing regulations with international and European requirements, operating experience, insights gained from safety analyses for operating nuclear installations, development of technology and results of safety research is evaluated continually, with regular yearly (August/September) summarization of needs of any amendments to the legislation. Such regular changes are incorporated into governmental legislation-making plan

(approved by the Government) and more precisely described in the internal SÚJB's legislation-making plan. Changes of legislation are done also on ad hoc basis in case of an urgent need. For the moment, several minor amendments of the Atomic Act related to new Building Code, to deep geological repository of the RAW planning and to state registers are under preparation.

The process is enabled and required by already mentioned Article 24 of the Act No. 2/1969 Coll.

### **3 Article 5 - Competent regulatory authority**

Article 5.1 - Establishing and maintaining a competent regulatory authority in the field of nuclear safety of nuclear installations

#### **3.1.1 Legal foundations of the regulatory authority**

The SÚJB was established through the Act No. 21/1993 Coll., amending the Act No. 2/1969 Coll., as a central governmental body of the Czech Republic. In agreement therewith after the dissolution of the Czech and Slovak Federal Republic, the SÚJB assumed power and competency of the former Czechoslovak Atomic Energy Commission in respect to the state supervision over nuclear safety and nuclear materials.

The Czech Parliament extended the SÚJB competence to include issues of protection against ionizing radiation in July 1995. As a result, Czech regulatory bodies in charge of nuclear safety and radiation protection have merged and the SÚJB has become an integrated state regulatory body, which carries out the state supervision for the whole area of the utilization of nuclear energy and ionizing radiation.

#### **3.1.2 The regulatory authority and its responsibilities**

Article 208 of the Atomic Act provides following competences of the SÚJB. The SÚJB is empowered to:

- issue licenses for the performance of activities and register and receive notifications of activities,
- approve packaging assemblies for the carriage, storage or disposal of radioactive or fissile materials, sources of ionizing radiation and other products,
- grant authorizations for the performance of activities of particular relevance to nuclear safety and radiation protection,
- approve documentation for licensed activities,
- establish emergency planning zones,
- monitor and assess the exposure situation and regulate exposure of natural persons, including exposure from natural sources of radiation and draw up, in cooperation with the relevant administrative authorities, national plans to address and provide information about situations,
- issue, register and verify individual radiological monitoring documents,
- maintain lists and registers in the area of the peaceful uses of nuclear energy and ionizing radiation, including lists and registers according to international treaties binding on the Czech Republic,
- establish the design basis threat,
- perform the role of the organization for international verification of compliance with the comprehensive nuclear test ban,
- ensure international cooperation within the field of its competence, provide information from the field of its competence to the International Atomic Energy Agency, the Euratom and other authorities of the Euratom and ensure implementation of other obligations arising from Euratom legislation relating to, in particular, the national and international evaluation of the exercise of State Authority over nuclear safety of nuclear installations and management of nuclear materials and high-activity sources,

- decide on the management of nuclear items, sources of ionizing radiation or radioactive waste in cases where they are managed in conflict with legislation or a situation that has arisen is not being rectified, including cases when these have been found, and, if necessary, organize a search for such sources of ionizing radiation,
- once a year, present to the Government and to the public a report on its activities and an annual report on radiation situation monitoring in the territory of the Czech Republic,
- submit opinions on territorial development policies and territorial planning documentation in terms of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security of activities related to the use of nuclear energy and activities in exposure situations,
- provide information in the area of radioactive waste management and spent fuel,
- issue binding opinions on spatial planning decisions concerning construction on land where a closed radioactive waste disposal facility is sited; the binding opinions shall express if the intended plan is acceptable from a perspective of radiation protection and monitoring of radiation situation and set down conditions of radiation protection and monitoring of radiation situation ensurance relevant to this plan,
- issue binding opinions in proceedings and other actions relating to nuclear installations under the building act,
- provide information on important findings obtained in the context of its control activities and from reporting on radiation extraordinary events and radiological occurrences, including information relating to the justification of activities, regulation of sources of ionizing radiation and radiation protection,
- draw up and update the national action plan for regulation of public exposure from radon and define the concept for the management of existing exposure situations,
- inform the general public about potential risks of exposure from a source of water for an individual supply providing on average less than 10 m<sup>3</sup> a day, or serving fewer than 50 persons, unless the water is supplied as part of a commercial activity or public service.

According to Article 209 of the Atomic Act the SÚJB shall:

- draw up the national monitoring programme and, after it has been approved, forward it to the affected persons,
- manage and carry out radiation situation monitoring in the territory of the Czech Republic, including the comparative measurements organized by the European Commission, evaluate its results and report radiation situation monitoring data to the European Commission,
- ensure and conduct drills and emergency exercises for radiation extraordinary event response,
- in cooperation with the Ministry of the Interior, draw up the national radiation extraordinary event plan,
- provide preliminary information to the general public for the event of a radiation accident, concerning protective measures and steps that need to be taken to ensure radiation protection; the preliminary information provided shall be up-to-date and constantly available and it shall be provided automatically and repeatedly, at regular intervals and whenever a significant change occurs,
- issue proposals for urgent protective action or follow-up protective action, in accordance with the national radiation extraordinary event plan and on the basis of the results of the radiation situation monitoring carried out, or to further specify or withdraw the action and to confirm or further specify proposals for the introduction of urgent protective action issued by license holders,
- ensure information of the general public about the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic outside an emergency planning zone and about the steps and measures to be taken during the various stages of development of

the radiation accident, unless this information is being provided by another administrative Authority,

- participate, within the scope of its competence, in the provision of information about the occurrence and the course of a radiation accident within an emergency planning zone,
- ensure that the competent regulatory authorities of neighbouring Member States of the Euratom are notified of the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic and about the steps and measures to be taken during the various stages of development of the radiation extraordinary event,
- ensure that an international peer review is invited immediately in the case of a radiation accident that has occurred in the territory of the Czech Republic and led to the implementation of protective measures outside a nuclear installation grounds,
- provide information about the adoption of measures to protect the general public in the Czech Republic in the event of a radiation accident arisen in the territory of Member States of the Euratom to the European Commission and other Member States of the Euratom which may be affected by these measures and, in accordance with the Czech Republic's international commitments, provide public access to information thus obtained,
- ensure notification of regional authorities about the occurrence and the course of a radiation accident outside the territory of the Czech Republic and about the steps and measures to be taken in the course of the radiation extraordinary event.

The Atomic Act include even other responsibilities of the SÚJB, such as the responsibility to decide on authorized limits for exposure of individuals, performing assessments and inspections, enforcement measures including imposing penalties. The SÚJB as the central governmental body is authorized to propose and define national nuclear safety requirements through issuance of implementing regulations to the Atomic Act.

Article 5.2 - Effective independence of the competent regulatory authority from undue influence

### **3.1.3 Functional separation of the regulatory authority**

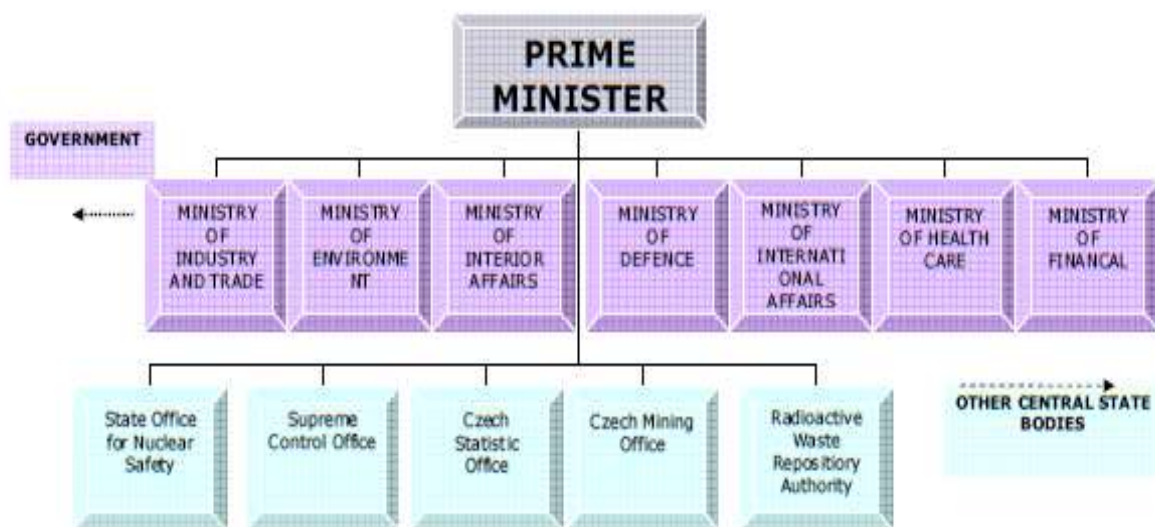
The SÚJB is an independent central governmental body directed by a chairperson. The statute of the SÚJB within the state administration structure is shown in figure bellow. Within its powers and competencies, the SÚJB is responsible only to the Government of the Czech Republic. The SÚJB chairperson is appointed by the Government and is responsible for the execution of all the SÚJB duties stipulated by the Atomic Act directly to the Prime Minister. The SÚJB has its own chapter within the state budget approved by the Parliament annually.

The independence of the SÚJB as regards the regulatory decision making process is guaranteed by the general principles of the state administration, as stipulated by the Act No. 500/2004 Coll. and valid and relevant for all activities of the state administrative bodies. Moreover, the central governmental bodies are bound by requirements of the Act No. 2/1969 Coll. Article 20 of the Act No. 2/1969 Coll., which stipulates that ministries and other central administrative bodies, including the SÚJB, fulfill under their competency tasks set in acts and other generally binding regulations and tasks resulting from a membership of the Czech Republic in European Union and in other integrational structures and international organizations, if binding for the Czech Republic. The central governmental bodies including the SÚJB should act independently and be bound only by constitutional acts and acts. According to Article 2 of the Act No. 500/2004 Coll. the SÚJB proceeds in compliance with the acts and other legal regulations as well as international treaties which form part of the legislation. The SÚJB executes its powers only for those purposes, for which it has been entrusted thereto by law, and within the scope determined thereby. The rights acquired in good faith as well as the lawful interests of

persons affected by the activities of the administrative authority in the particular case should be examined, and the SÚJB may interfere with these rights only under the conditions set forth by law and in the inevitable scope. The adopted solution must be consistent with the public interest and respectful to the circumstances of the particular case and no reasonable discrepancies may arise in respect of decisions on cases of identical or similar merit. Based on Article 7 para 1 of the Act No. 500/2004 Coll., the SÚJB has to proceed impartially and requests all persons concerned to observe their process obligations equally.

Material requirements and obligations in relation to nuclear safety are enacted in the Atomic Act and its implementing regulations and the SÚJB is responsible for their independent and impartial application within the decision-making (e.g. licensing) process.

Position of the State Office for Nuclear Safety in the State Administration is shown on the picture No. 1 below



### 3.1.4 The regulatory decisions founded on robust and transparent nuclear safety-related requirements

Every regulatory activity and decision of the SÚJB is based on legal requirements, which are part of the relevant laws and regulations. A description of these legal instruments including the list of nuclear safety relevant regulations is drawn in part 2.3 of this report (part 2.3. deals with the national nuclear safety requirements). In addition to legally binding requirements, SÚJB issues and makes public on its web-site recommendations explaining possible and acceptable ways of implementing individual regulations/legal requirements.

### 3.1.5 Dedicated and appropriate budget allocations

The SÚJB management is responsible for ensuring adequate resources for all regulatory activities (regulatory control of safety and security of NPPs, emergency preparedness, radioactive waste management and use of radiation and safeguards).

The SÚJB as a central governmental body has its own independent budget in a form of a separate budgetary chapter within the Act on State Budget, which is approved by the Parliament annually.

Adequate resources needed for the SÚJB operation are therefore ensured through standard state budget planning procedures required for all parts of the Government (ministries, central offices). It is mainly three year mid-term work/financial plan that serves as vehicle in this process.

Every year the SÚJB submits to the Ministry of Finances inputs necessary in its fields of activity for preparation of draft of the state budget and of other measures with broader impacts (Article 23 of the Act No. 2/1969 Coll.). The draft of the budgetary chapter is based on actual and future needs of the SÚJB and experience from previous budgetary needs and allocations.

However, public financing of the SÚJB's activities is supplemented with incomes from special fees paid by licensees as prescribed by Articles 34 to 42 of the Atomic Act (formerly Article 3a to 3g of the Act No. 18/1997 Coll.). Following types of licenses (licensees) are involved in the system of fees:

- a license for the siting of a nuclear installation,
- a license for the construction of
  - a nuclear installation, or
  - a category IV workplace, except workplaces with a nuclear installation,
- the first license for the operation of
  - a nuclear installation,
  - a category III workplace for activity related to acquiring of radioactive minerals, or
  - a category IV workplace, except workplaces with a nuclear installation,
- a license for the individual phases of decommissioning
  - a nuclear installation,
  - a category III workplace for activity related to acquiring of radioactive minerals, or
  - a category IV workplace, except workplaces with a nuclear installation.

The fees are income of the budgetary chapter of the SÚJB and could represent up to 55 % of all financial means available to the SÚJB. Nevertheless, effectiveness of this budgetary source depends on actual numbers of relevant licensees.

At present SÚJB's financial resources are sufficient for the fulfilment of the functions defined by the Atomic Act. For 2020, the Act No. 355/2019 Coll., on State Budget For Year 2020, sets the SÚJB budgetary chapter's (no. 375) parameters as follows:

- Outcomes (i.e. total volume of the chapter): 445 248 327 CZK,
- Incomes (i. e. fees): 170 000 00 CZK,
- Salaries: 142 849 186 CZK.

Detailed allocation of resources to different areas of the SÚJB's regulatory activities as well as to administration and to development activities is set up in the detailed annual SÚJB's budget and associated plans/programs. The plans are discussed first at different levels of SÚJB's management meetings and finally approved at the SÚJB's management meeting and signed by the SÚJB Chairperson.

### **3.1.6 Staff with qualifications, experience and expertise**

Key legal act regulating staffing of the state administrative bodies, including the SÚJB, in the Czech Republic is the Act No. 234/2014. Coll. The Act enacts general requirements for state (civil) servants, i.e. state officials, including the SÚJB's inspectors and other employees. Among its regulated topics belong: systemisation of the state administrative bodies (i.e. structure, number of staff, functions), qualification and other aspects of professional competence, civil service employment and its conditions (appointment to civil service, changes, termination), rights and duties of civil servants (in general), disciplinary liability, conditions of service (incl. educating and enhancing qualifications) and salaries and other forms of remuneration of civil servants.



Systemisation is based on binding rules of organizational structure of service authorities, incl. the SÚJB, to secure proper performance of the service authority. For each service authority, it stipulates the following:

- the number of service posts of civil servants, who are not senior civil servants, classified according to their pay grade,
- the number of service posts of senior civil servants, classified according to their pay grade,
- financial resources for civil servants' salaries,
- the number of service posts, holders of which, with respect to the protection of public interests, must be citizens of the Czech Republic,
- the number of service posts, holders of which are prohibited to, after the termination of their civil service employment, directly or indirectly engage in business or any other entrepreneurial activity, be a partner or a member of a company in the field identical to the field under their responsibility when in civil service, or be employed or be in any other similar relationship to a business in such field (i.e. the "non competition clause").

Systemisation must be adopted by the Government for the calendar year following the current year. The Minister of the Interior submits the draft systemisation to Government. The Government is authorized to, in the context of the process of adopting the systemisation, modify the organizational structure of the respective service authority. The SÚJB draws up in line with the systemisation a draft organizational structure of the service authority – the draft is then approved by the chairperson of the SÚJB.

More detailed requirements can be found in implementing regulations to the Act No. 234/2014 Coll.

The SÚJB prescribes requirements regarding qualifications, experience and expertise for particular service posts in its systemisation by its internal regulation (according to Art. 25 para 5 letter a) of the Act No. 234/2014 Coll.). Currently, requirements for the posts (and employees) of the SÚJB are set down by internal directive VDS 039/2001 (rev. 4.1/2020) - System of the preparation, education and evaluation of SÚJB employees and by the descriptions of qualification requirement for all working positions in SÚJB.

Training for SÚJB staff is organized on the basis of the SÚJB internal regulation VDS 039/2001 (rev. 4.1/2020) - System of the preparation, education and evaluation of SÚJB employees; the mentioned document is approved by the SÚJB top management and is of an internal regulation nature. The guideline has been developed on the basis of the results of the first part of the project co-financed by the European Social Fund (ESF) Operational Programme "Human Resources and Employment – Strengthening Efficiency of Public Administration", the subject of which was to establish a Systematic Concept of SÚJB Staff Training and Development.

Systematic performance and individual approach to individual employees are the fundamental principles in training for SÚJB staff. The objective is to preserve the continuous character of training by combining general and specialized training. The SÚJB also makes use of SÚJB's internal lecturers from among experienced specialists.

As part of training provided for inspectors, the special course focused on nuclear technologies was organized in the Training Centre of the ČEZ, a. s., in Brno on repeated occasions. Other SÚJB inspectors, in particular resident inspectors, completed training on full-scale simulator of the control system of the nuclear power plant under supervision and improved thus significantly their qualification for their inspection activities. The inspectors participate also in SÚJB internal seminars organized for every significant event or event of interest from the viewpoint of SÚJB sphere of action. The seminars are especially focused on event description and cause analysis.

The SÚJB uses the learning actions organized by various training entities such as Public Civil Servants Training Institute to train SÚJB inspectors in other fields related to the performance of their function such as interpretation of the provisions of related legislation, language training, communication skills and use of SW applications.

The number of employees at the SÚJB in 2019 was 210. Approx. 2/3 of the positions comprise nuclear safety and radiation protection inspectors. Distribution of staff to different organizational units at the SÚJB reflects the nature and safety significance of regulated activities. Most of the professional staff of the SÚJB hence work on regulatory functions related to the nuclear safety and radiation protection. The number of people in nuclear safety section has increased over the past five years. The SÚJB trains its personnel continuously. Training programmes are established on organizational as well as on individual level reflecting the tasks and responsibilities of the individual. Individual needs for training are identified in the course of work and in keeping with internal regulation VDS 039/2001 (rev. 4.1/2020) - System of the preparation, education and evaluation of SÚJB employees. For more details see Chapter 5.1.5. In addition to competence and resources of SÚJB's own staff, the SÚJB uses technical organizations as well as other consultants to support regulatory activities. As the SÚJB is the final decision-maker in the regulated area, SÚJB's internal expertise has to be adequately strong to arrive at proper regulatory decisions.

SÚJB staff responsible for the inspections are inspectors. The inspectors are appointed by the chairperson of the SÚJB. Their workplaces are situated at the SÚJB Headquarters, in offices on the sites of Dukovany and Temelín NPPs and in the Regional Centers offices.

All SÚJB inspectors are university graduates; the majority are graduates of technical universities. Some of the inspectors have experience from industry, nuclear research or NPP commissioning and operation. The SÚJB created a system of continuous training for its staff.

At present the SÚJB's human resources are sufficient for the fulfilment of functions defined by the Atomic Act.

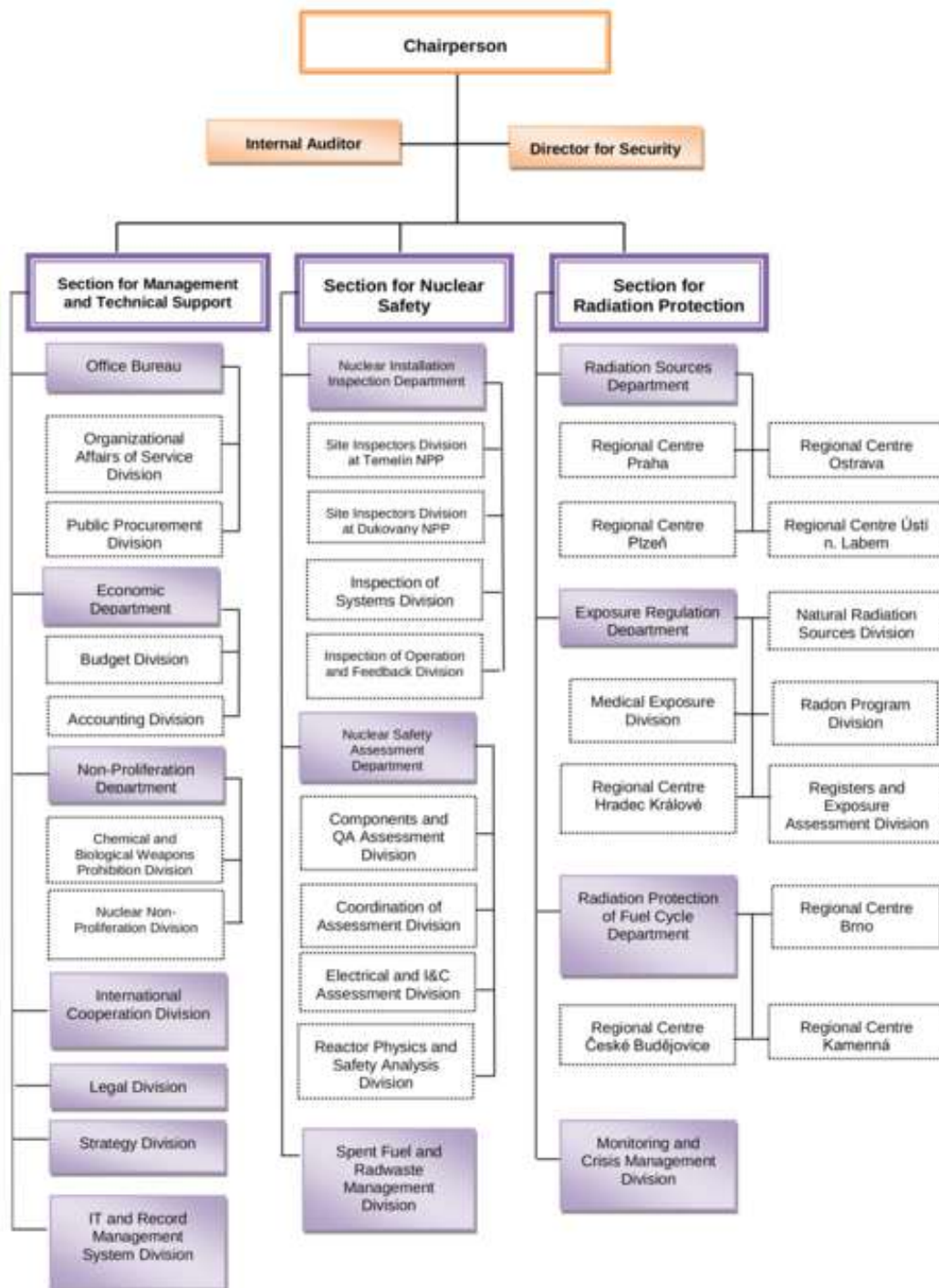
The organizational structure of the SÚJB consists of 3 sections headed by section directors and 3 separate units. The three sections are:

- Nuclear Safety Section, which includes two departments (Nuclear Safety Assessment and Nuclear Installation Inspection) and Spent Fuel and Radwaste Management Division;
- Radiation Protection Section, which includes three departments (Exposure Regulation, Radioactive Sources, Radiation Protection of Fuel Cycle) and the Monitoring and Crisis Management Division;
- Management and Technical Support Section, which includes three departments (International Cooperation, Finances, Non-Proliferation Supervision).

The three separate units are related to:

- Internal audit and Financial Supervision;
- Security Affairs;
- Secretariat services for the SÚJB Chairperson.

The detail organizational structure of the SÚJB is shown on the picture No. 2 bellow.



### 3.1.7 Procedures for the prevention and resolution of any conflicts of interest

Conflict of interest and its solution are solved in the Czech legal framework in various and parallelly acting contexts.

Firstly, all civil servants, including inspectors and other employees of the SÚJB (and other state administrative bodies), are obliged to refrain from any actions that could lead to a conflict of public interest with personal interests, in particular not to use insider information for their own benefit or for the benefit of another person, and not to abuse their civil service post (Art. 77 para 1 letter i) of the Act No. 234/2014 Coll.). For the duration of their civil service employment senior civil servants are not allowed to hold any office in a political party or a political movement. A civil servant cannot be a member of executive or supervisory bodies of legal entities operating as business companies, with the exception of cases when they were nominated to any such body by the appointing authority; a nominee civil servant acts as a representative of the state in these bodies, and shall be obliged to enforce the state interest. A civil servant may hold other gainful occupation than the civil service only with a prior written consent of the appointing authority (the SÚJB). The restriction is not applied to the following activities: research, teaching, publication, literature or art; performing service as a sworn expert or interpreter for a court or another public authority than the place of service; performing service in consultative and advisory bodies to the Government; performing service in consultative or other bodies of the Central Administrative Authority or special authorities which exercise the powers of state administration; and the management of their own property. Moreover, the Act No. 234/2014 Coll. enables to identify service posts of senior civil servants for which a non-competition clause may be required or negotiated.

Breaching the aforementioned rules for prevention of the conflict of interests is considered a breach of service discipline and shall constitute a disciplinary infraction. Civil servants hold liability for their disciplinary infraction. A disciplinary measure may be imposed on a civil servant for a disciplinary infraction. A disciplinary measure may be in the form of:

- a written reprimand,
- deduction of 15 % of the pay for up to 3 calendar months,
- removal from the service post of a senior civil servant, or
- dismissal from the civil service.

Secondly, conflict of interest is prevented in the course of administrative proceedings and inspections by special provisions of the Act No. 500/2004 Coll. Any official, in respect of whom it is reasonable to presume that, due to its relation to the case, parties to the procedure or representatives thereof, it has such interest in the outcome of the procedure which appears to cast doubt upon its impartiality should be excluded from any and all acts within the procedure through the conduct of which it could influence the outcome of the procedure. This rule is applicable even to the inspection performance. The party to the procedure or the inspected person may claim the official's bias as soon as it learns thereof. An official who learns of circumstances suggesting that he/she is excluded, is obliged to inform its superior thereof without any delay. The superior of an official who has been excluded shall forthwith appoint another official in place thereof who shall not be in a subordinate position to the excluded official.

Moreover, the SÚJB, such as other state administrative bodies in the Czech Republic, has a system of internal procedures preventing conflict of interests, based on its internal regulations, namely VDS 004 Code of Employment and Order of the Chairperson No. 24/2019 Ethic Code.

### 3.1.8 The reporting arrangements of the regulatory authority

Central governmental bodies inform adequately the public on proposals of serious measures according to Article 22 of the Act No. 2/1969 Coll.

In general, all state administrative bodies, including the SÚJB, are obliged to provide information regarding its activities and area of responsibility, as requested by the Act No. 106/1999 Coll. This obligation and scope of information cover even all issues relevant from perspective of nuclear safety, radiation protection, nuclear security, safeguards, monitoring of radiation situation and emergency management. The authorities including the SÚJB should make any information related to their functioning publicly available, mainly through their websites, among others:

- reason and the way of establishing the authority including the conditions and principles under which it operates,
- description of its organizational structure, the place and the way of obtaining relevant information, where to submit a request or file a complaint, submit a proposal, instigation or any other request or where to receive the decision on the persons' rights and duties,
- place, time for compliance with the request, and the way, where to seek a remedial measure against the decision of the legally bound person on the rights and duties of persons including the explicit list of requirements put on the applicants in this respect, as well as the description of procedures and rules, which are necessary to comply with during these activities, and description of the relevant form and the way and place where such a form can be obtained,
- procedure the authority is obliged to comply with when disposing of the requests, proposals or other requests by citizens, including the relevant times that are necessary to observe,
- list of the most important regulations, according to which the authority particularly acts and makes decisions, which set the right to request information and to provide information, and which regulate further citizens' rights in relation to the authority including the information where and when the regulations are provided for inspection.

In case of the SÚJB this information is provided to the public without any clearance from any other body or organization.

The authorities, including the SÚJB, are also obliged to provide information related to its activities and area of responsibility to an applicant following his/her request. The Act establishes strict procedure for administration of such request, however, the right to free access to information is formulated in very broad and open manner and allows to obtain almost all information on nuclear safety (except of classified information and trade secret).

Similar legal regime of free access to information, including information on nuclear safety, is provided by the Act No. 123/1998 Coll. which is focused on information on environment.

Specific reporting and information disseminating provisions are included in the Atomic Act (Art. 208 and 209). The SÚJB is obliged to:

- once a year, present to the Government and to the public a report on its activities and an annual report on radiation situation monitoring in the territory of the Czech Republic,
- provide information on important findings obtained in the context of its control activities and from reporting on radiation extraordinary events and radiological occurrences, including information relating to the justification of activities, regulation of sources of ionizing radiation and radiation protection,
- provide preliminary information to the general public for the event of a radiation accident, concerning protective measures and steps that need to be taken to ensure radiation protection; the preliminary information provided shall be up-to-date and constantly available and it shall be provided automatically and repeatedly, at regular intervals and whenever a significant change occurs,

- ensure information of the general public about the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic outside an emergency planning zone and about the steps and measures to be taken during the various stages of development of the radiation accident, unless this information is being provided by another administrative Authority,
- participate, within the scope of its competence, in the provision of information about the occurrence and the course of a radiation accident within an emergency planning zone,
- ensure that the competent regulatory authorities of neighbouring Member States of the Euratom are notified of the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic and about the steps and measures to be taken during the various stages of development of the radiation extraordinary event,
- provide information about the adoption of measures to protect the general public in the Czech Republic in the event of a radiation accident arisen in the territory of Member States of the Euratom to the European Commission and other Member States of the Euratom which may be affected by these measures and, in accordance with the Czech Republic's international commitments, provide public access to information thus obtained,
- ensure notification of regional authorities about the occurrence and the course of a radiation accident outside the territory of the Czech Republic and about the steps and measures to be taken in the course of the radiation extraordinary event.

Article 5.3 – SÚJB legal powers necessary to fulfil its obligations

### **3.1.9 The legal powers**

As regards the SÚJB's legal powers related to SÚJB's: participation in the definition of national nuclear safety requirements, power to require the license holder to comply and demonstrate compliance with national nuclear safety requirements and the terms of the relevant license, verification of the compliance and power for enforcement, they are to large extend described in chapter 3.1.2 of this report. Additional information is provided in chapters 3.1.4 to 3.1.7 of this report.

For the inspections carried by the SÚJB - rights and obligations of the inspectors are stipulated in the Atomic Act, Article 203 (formerly Art. 39 of the Act No. 18/1997 Coll.) and mainly in the Inspection Code.

SÚJB inspectors are authorized to access in the course of inspections buildings, land and other premises, which are owned or used by the inspected party or are otherwise directly related to the performance and subject of inspection. They may require evidence of fulfilment of all obligations for the provision of nuclear safety, radiation protection, physical protection and emergency preparedness of nuclear installations etc. Among others they may conduct the required measuring, tests and collect samples at the premises of inspected persons which are necessary for checking the compliance with the legal requirements. They may create image or audio recordings and they may request further cooperation required to perform inspection from the inspected party.

Article 5.3 (a) - Legal provisions entrusting the SÚJB with power to propose, define or participate in the definition of national nuclear safety requirements

As stipulated by the Act No. 2/1969 Coll. (Art. 22), the SÚJB (as other central governmental bodies) takes care of suitable regulation of matters belonging among competences of the Czech Republic. It elaborates bills of laws and other legal acts (i.e. decrees) regarding matters belonging among its competences and drafts which preparation was imposed to it by the Government. The SÚJB takes care of preserving legality within a scope of its competences and takes necessary remedial measures in accordance with laws.

In conformity with this principle and with general legislation-making power of the central administrative bodies as enacted in the Constitution of the Czech Republic the SÚJB is entitled prepare amendments to the Atomic Act (to be approved by the Government and later by the Parliament and the President – see chapter 2.1.2 above) and to adopt implementing regulations to the Atomic Act. Article 236 of the Atomic Act explicitly enumerates the provisions (and thus items) that should be further elaborated in a form of decrees by the SÚJB. Since the Atomic Act regulates nuclear safety in complex manner, all aspects of nuclear safety are covered by these decrees.

List of the decrees can be seen in Annex 1 of this report. Nuclear safety aspects are regulated mainly by following of them: No. 358/2016 Coll., No. 377/2016 Coll., No. 378/2016 Coll., No. 408/2016 Coll., No. 409/2016 Coll., No. 21/2017 Coll., No. 162/2017 Coll. and No. 329/2017 Coll.

Article 5.3 (b) - Legal provisions to require the licence holder to comply and demonstrate compliance with national nuclear safety requirements and the terms of the relevant licence

The main competency given to the SÚJB is to issue licenses to perform activities governed by the Atomic Act. The SÚJB decides on granting a license after having verified that the applicant has fulfilled all the conditions established in the Atomic Act and in implementing regulations. This is realized through assessment of documentation required to be attached to a license application separately for activities mentioned in Article 9 of the Atomic Act. The documents related to the individual license are listed in the Appendix 1 to the Atomic Act.

The essential document to demonstrate the compliance with legal requirements for nuclear installation design is the Safety Analysis Report (SAR). There exist three types of SAR:

- Initial Safety Analysis Report (for siting license)
- Preliminary Safety Analysis Report (for construction license)
- Operational (Final) Safety Analysis Report (for commissioning and operation licenses).

The SÚJB approves by its decision the documentation explicitly listed in the Appendix 1 to the Atomic Act. In general, an applicant for a license is obliged to submit to the SÚJB for approval:

- List of classified equipment;
- Limits and conditions for safe operation of the nuclear installation;
- Program of operational controls;
- Physical protection assurance plan;
- Proposal for designation of an emergency planning zone and for delineation of a controlled area.

Other documents listed in the Appendix 1 of the Atomic Act must be submitted to the SÚJB, the SÚJB may raise objections against them and they have to be adjusted in accordance with such objections. Even though such documents are not approved by the decision, the SÚJB's power to affect their scope, content and even form is established directly by the Atomic Act (Art. 24).

Any changes to the documentation specified above must be approved by the SÚJB in the similar administrative procedure. Amendments to non-approved documentation must be notified by the licensee to the SÚJB within 30 days or, if there is danger in delay, 72 hours prior to the time he or she intends to act in accordance with them. The SÚJB is empowered to request that the license holder remedy the deficiencies and to set a reasonable deadline for this. The license holder may not act in accordance with the amended documentation for the licensed activity unless it complies with the legal (and SÚJB's) requirements.

The SÚJB is authorized to require additional documentation that demonstrates compliance with the national nuclear safety requirements in the decision-making process.

### 3.1.10 Examples

SÚJB decision on a license for operation may include conditions under which operation activities can be realized within the time period for which the license is issued. Observance of the specified conditions is obligatory and even punishable by penalty according to Article 175 para 1 letter a) of the Atomic Act.

Operation license conditions may among others include:

- Annual general updating of SAR (maintain living SAR) summarizing all project changes performed up to the end of the calendar year or extended to SAR if necessary. The new extended content of Initial SAR for siting of new reactors was set in 2010;
- Periodic Safety Review (PSR) execution in a ten-year period as an implementation of international practices required by the SÚJB. The content of PSR is described in a regulatory guide published on its website;
- Probabilistic Safety Assessment (PSA) results shall be annually reported to the SÚJB and “Living PSA study” should be maintained by the licensee and all modifications shall be included;
- Summary information on safety-related events and safety performance indicators;
- Updating of Severe Accident Management Guides including guides for control room activity and technical support center;
- Ageing assessment of systems and components regarding time of operation;
- Assessment of reliability of electrical components and I&C components;
- Specific testing programs shall be approved by the SÚJB, e.g. commissioning stage programs, fuel reloading program, testing operation program, etc.;
- Measurement of fuel assemblies or any other specified component or system.

### 3.1.11 General Obligations of license holders supervised by the SÚJB

License holders are obliged e.g. to (Art. 25 of the Atomic Act):

- ensure nuclear safety (whereas the responsibility for nuclear safety of a nuclear installation cannot be delegated to another person), radiation protection, security and emergency management, including its verification, in the scope appropriate to the particular license;
- notify the SÚJB without delay of any changes or events relevant to nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, security and management of nuclear materials and any changes in the facts relevant for the issue of the license or for registration, except information identifiable from a public register,
- investigate without delay any breaches of the Atomic Act, take corrective action and prevent the recurrence of such situations,
- assess nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security within the scope of applicable requirements,
- ensure that activities of particular relevance to nuclear safety and radiation protection are performed by selected workers,
- comply with the technical and organizational conditions for the safe operation of nuclear installations and workplaces with a source of ionizing radiation and technical and organizational conditions for the safe management of sources of ionizing radiation and act in accordance with internal regulations,
- monitor, measure, evaluate, verify, and record quantities and facts relevant to nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security and retain and forward information about them to the Office, as well as participate in comparative measurements organized by the Office and take corrective action if the participation in comparative measurements is not successful,



- keep and retain a register of sources of ionizing radiation, radioactive waste and nuclear items and forward data from the register to the Office,
- forward information to the European Commission as required under this Act or Euratom legislation or European Union legislation, including identification data of natural persons, and provide this information to the Office.

Special obligations related to ensuring nuclear safety are prescribed by Article 49 of the Atomic Act:

- provide for and maintain the financial and human resources necessary to fulfil the obligations related nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security,
- ensure that, from the commencement of construction to decommissioning, the nuclear installation
  - meets the safety objectives, safety functions and principles of the safe use of nuclear energy,
  - reflects the site characteristics of the site for a nuclear installation and
  - meets the nuclear installation design requirements,
- if limits and conditions area breached, ensure, from the commencement of construction to decommissioning, that the nuclear installation is brought to a state in which nuclear safety is ensured,
- conduct safety assessment,
- based on the safety assessment, constantly increase the level of nuclear safety as far as reasonably practicable,
- ensure that where the safety assessment concerns facts that are of relevance to ensuring nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, and security of a nuclear installation, it is verified by persons who did not directly participate in the safety assessment,
- draw up and continuously update internal regulations according to the actual state of the nuclear installation to be in conformity with the nuclear installation design and cover all states of the nuclear installation envisaged in the nuclear installation design,
- prior to commencing a subsequent phase of the nuclear installation's life cycle, ensure, verify and document the readiness of the nuclear installation and its personnel for this phase,
- document the steps within the feedback system, retain this documentation throughout the nuclear installation's life cycle,
- execute an investigation of an operational occurrence, notify an operational occurrence to the office and take measures to prevent an operational occurrence and to remedy the state after an operational occurrence,
- ensure fire and explosion prevention, detection and elimination, as well as exclusion and limitation of their impact on nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security,
- continuously evaluate the facts relevant to the assessment of the acceptability of the site for a nuclear installation and their effect on nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, and security,
- estimate developments in the facts relevant to the assessment of the acceptability of the site for a nuclear installation with a view to the expected length of the nuclear installation's life cycle,
- determine the qualification requirements for activities relevant to nuclear safety and provide for a system of education, training and practice for the personnel, including a register of the qualifications obtained and their verification with respect to the relevance of the activities performed,
- document and report to the SÚJB the carrying out of other modifications in the use of nuclear energy,

- evaluate modifications in the use of nuclear energy made in the course of the nuclear installation's life cycle, except siting, in terms of their effect on nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, and physical protection,
- ensure, maintain and practice radiation extraordinary event management measures and procedures set out in the on-site emergency plan and internal regulations,
- from the commencement of construction to decommissioning of the nuclear installation, continuously monitor the state of the nuclear installation and its systems, structures and components in terms of the implementation of the controlled ageing process in accordance with the controlled ageing programme,
- prevent fission chain reaction and release into the environment when handling nuclear materials and radioactive waste and document this handling, and
- introduce processes and activities, the purpose of which is to prevent accident conditions at a nuclear installation from escalating and mitigate their consequences, document them and continuously update them.

Without a previous license provided by the SÚJB, no installation modifications, nor other technical or organizational changes with an impact on nuclear safety, radiation protection, physical protection or emergency preparedness can be developed or realized.

#### Article 5.3 (c) - Legal arrangements for verification of compliance

Execution of the state supervision of peaceful utilization of nuclear energy and ionizing radiation is governed by Article 200 to 203 of the Atomic Act.

The SÚJB conducts inspections of compliance with the Atomic Act, regulations issued to implement this Act, commitments arising from international treaties binding on the Czech Republic applicable to the peaceful use of nuclear energy and ionizing radiation, and decisions issued on the basis of this Act, and inspections of the performance of the obligations laid down in the metrology act as regards measuring instruments intended or used for measuring ionizing radiation and radioactive substances. Inspected persons are:

- license holders, registered persons and notifying persons,
- manufacturers, importers and distributors of products type-approved by the SÚJB,
- persons performing activities in the context of the peaceful use of nuclear energy and ionizing radiation not subject to authorization under this Act,
- persons engaged in radiation situation monitoring,
- holders of authorizations for the performance of activities of particular relevance to nuclear safety and radiation protection,
- authorized and accredited persons performing assessment of conformity of selected equipment with technical requirements,
- persons in respect of whom there are reasonable grounds for believing that they are breaching obligations laid down in this Act, regulations issued to implement this Act and decisions issued on the basis of this Act, or commitments arising from international treaties binding on the Czech Republic applicable to the peaceful use of nuclear energy and ionizing radiation.

The persons conducting inspections are inspectors. The authorization of an inspector to conduct inspections has the form of an identity card issued by the SÚJB. The SÚJB's plan of inspections takes into account the potential extent and nature of the risk associated with the subject matter of the inspections and a general assessment of radiation protection issues. The plan of inspections is available to the public on the SÚJB's website.

### 3.1.12 Examples

The SÚJB inspection annual plan is prepared in compliance with the internal directive VDS 008 “Inspections planning, performance and evaluation at nuclear installations” and covers inspection areas specified in IAEA GS-G-13. Inspections are focused not only on the technical aspects of operation including the professional competence of control room operators, but also on the integrated management system and its exercise.

The inspection procedures for repeated inspections are implemented in detailed inspection procedures for supervising activities related to system operation. The special inspection is performed using an individual one-time procedure that shall be approved by responsible manager.

Routine inspection performed by resident/site inspectors is focused on operation, technical specification and the observance of operational procedures and safety culture. The data on safety culture is presently collected, assessed and the results are used in inspection planning.

The resident inspector can be also present in internal discussions of a committee for events assessment established by the licensee. The results and conclusion of this committee are included in the Inspection Protocol (report).

The SÚJB has established the categorization of findings arising from the regulatory review and assessment. Findings and resolutions are communicated to licensee by formal letters or by way of meetings without delay and in accordance with terms stipulated by law:

- The finding is without influence to safe operation of the plant. Documentation can be approved, and permission or authorization can be issued.
- The finding is without influence to safe operation of the plant. Documentation can be approved conditionally.
- The documentation cannot be approved. Neither permission nor authorization can be issued.

All formal deficiencies of documentation have to be corrected in limited time period.

### Article 5.3 (d) - Legal arrangements for the regulatory authority to propose or carry out effective and proportionate enforcement actions

Legal arrangements and processes for enforcement by the SÚJB are described in chapter 2.1.6 of this report.

Briefly, the inspectors have power to issue binding orders of the inspectors. The binding order can, based on the performed inspection, prohibit, until a remedy is ensured, listed activities in the field of peaceful utilization of nuclear energy and ionizing radiation or seize potentially dangerous equipment. The SÚJB can also impose remedial measure and/or penalty, if a legal requirement is breached.

### 3.1.13 Examples

Every inspection is concluded with a final report (Inspection Protocol) and an assessment sheet; the final report serves to present the inspection results (findings) to the operator, while the assessment sheet serve to classify findings and inspectors have an opportunity to present proposals for improvements in further inspection, assessment, and regulatory activities of the SÚJB. Almost every month, an internal meeting at which inspections for the past month are evaluated and results are discussed and, if applicable, further steps are proposed.

The information about implementation of remedial measures is provided by the license holder to the SÚJB in the form of letter or record in daily on-site logs. The SÚJB evaluates the content of information and if the nature of finding demands, the effect of implementation of the measures is verified at the

NPP. The compliance with requirements stipulated in reports is tracked by the Inspection Assessment Commission.

## 4 Article 6 – License holders

Article 6 (a) - The prime responsibility for the nuclear safety of a nuclear installation rests with the licence holder

By the law (Atomic Act) the license holder has the prime responsibility for nuclear safety of a nuclear installation.

A person who uses nuclear energy, manages a nuclear item or performs activities in exposure situation must ensure nuclear safety, safety of nuclear items and radiation protection, while respecting the present level of science and technology and good practice (as laid down in Art. 5 para 2 letter a) of the Atomic Act). Moreover, obligation to ensure nuclear safety, radiation protection and safety of nuclear materials and other items in the nuclear field, which are important for ensuring the non-proliferation of nuclear weapons, cannot be transferred to another person (as laid down in Art. 5 para 4 of the Atomic Act), including suppliers or sub-suppliers.

In addition, it is the licensees' obligation to assure nuclear security and emergency management and other arrangements, necessary to ensure limitation of radiation and nuclear damage, as required by the Atomic Act and specified in implementing decrees.

The responsibility of the regulatory body (the SÚJB) is to verify that the licensees fulfil the legal requirements.

General obligations of licensees and further obligations relating to nuclear safety, radiation protection, nuclear security and emergency management are specified particularly in Art. 25, 49, 68, 69 (and others) of the Atomic Act.

Article 6 (b) - Demonstration of nuclear safety

### 4.1.1 Regulatory framework

As described in chapters 2.1.4 and 3.1.9 of this report, the applicant must submit safety demonstration to the SÚJB for review and assessment. The safety demonstration is provided through documentation describing all safety aspects of future licensed activity. The Atomic Act in its Appendix 1 provides for a documentation, which must be submitted for review and assessment to the SÚJB together with the application. Submission of the documentation is required by Article 16 para 2 letter d) of the Atomic Act in combination with Article 24 para 2.

Every licensed activity has its own listed scope of the documentation. However, system of documents and their detailed content, as provided by the secondary legislation, keep consistency through the lifecycle of the nuclear installation and it is allowed to update earlier versions of documents. Such regime establishes not only desired continuity in nuclear safety and its demonstration but also enables a graded approach.

The documentation submitted with the application is evaluated by the SÚJB within the framework of licensing administrative proceedings. Specified types of documents (the most safety relevant) are then approved by the SÚJB in form of a specific administrative decision, while others are adjusted according to the SÚJB's requirements and acknowledged. However, both types of documents are binding for the licensee (see Art. 24 para 1 of the Atomic Act) and without proving their full compliance with legal requirements the SÚJB would not issue any license.

#### 4.1.2 Examples of actual practice for proving nuclear safety by applicant

Continuous verification of nuclear and technical safety is ensured at the Dukovany NPP and the Temelín NPP by introducing a comprehensive strategy of the care of assets (for the purpose of this report, only physical assets are included, not intangible assets such as knowledge; both active and passive SSC).

The strategy is based on a graded approach to equipment according to its importance (functional importance) and legislative requirements. The graded approach is based, among others, on the classification of equipment (classification of equipment into different categories), which is taken into account in the implementation of preventive maintenance (different scope of maintenance for equipment of different categorization).

- **Strategy and implementation of the maintenance of assets:**

1. **Records of assets/systems, structures and components (SSC)** – records of process assets (SSC) of the power plant are kept in accordance with the managing and working documentation including acquisition of basic data on assets.
2. **Management of the physical configuration of assets (SSC)** – conformity of the physical state of assets (SSC) with the configuration documentation is maintained in accordance with the managing and working documentation.
3. **Categorization of assets (SSC)** – power plant SSC are categorized by their relevance to safety and production into categories according to the approved methodology (ČEZ\_ME\_0608), prepared with the use of world practice (WANO, INPO 913, EPRI) and taking into account the relevance of equipment function for the fulfilment of safety and production requirements imposed on equipment and is classified by relevance into three categories (cat. 1 – critical, cat. 2 – non-critical, cat. 3 – irrelevant).
4. **Identification of specific systems (Group A)** – categorization is performed on the basis of the standard ČEZ\_ST\_0072 – Requirements for NPP Reliability Management, methodology ČEZ\_ME\_0987 – Selection of Systems for Ageing Management, Assessment of the State of Ageing Management, or methodology ČEZ\_ME\_0608 – SSC Categorization in the Production Division. The specific equipment of Group A are as follows:
  - Safety-significant - i.e. the equipment performs the function of ensuring the integrity of the reactor coolant pressure boundary, the integrity of the containment/confinement or the function of preventing the leaks from containment/confinement.
  - Crucial equipment to maintaining the operation of a power plant - difficult-to-replace systems, for which the loss of their process function results in unacceptable losses in generation or equipment important to LTO.
5. **Establishment of the preventive maintenance program and its implementation** – the maintenance program is established in a graded approach based on equipment category. In addition to legislative requirements, it includes other preventive actions to maintain the required level of reliability and life durability of equipment. The program is developed with the use of the maintenance templates developed by NPP Design Modification Engineering Department and the Care of Assets Department, considering the international practice (EPRI).

The categorization of equipment in setting the maintenance program in order to manage the reliability is considered in the graded approach as follows:

- **Specific systems Group A** – preventive maintenance program is aimed at long-term reliability. The strategy is based on ageing management and the implementation of

preventive maintenance program with the use of developed specific/component specific ageing management programs where it is insufficient to use only standard methods of preventive maintenance and performance monitoring. This is particularly applied to the equipment with important passive safety function (category 1 or category 2). This group of equipment is determined in accordance with the relevant management documentation.

- **SSC category 1** – preventive maintenance program is aimed at high reliability and failure elimination with the use of standard methods of preventive maintenance. Reliability management is performed on the basis of monitoring of the performance and state with the use of standard methods of preventive maintenance.
- **SSC category 2** – preventive maintenance program is aimed at prevention of undesired failures (safety consequences for personnel, environment, high financial losses, etc.) with the use of standard methods of preventive maintenance. Ageing/reliability management is performed on the basis of monitoring of the state with the use of standard methods of preventive maintenance.
- **SSC category 3** – no maintenance program is set; this category is managed by assessing the efficiency of simple maintenance or equipment replacement, and equipment is in operation until corrective maintenance.

An integral input for the setting of preventive maintenance program is:

6. **In-service inspection (ISI) program** – In-service inspections are carried out in accordance with the in-service inspection program prepared by a license holder and approved by the SÚJB. Components important to nuclear and technical safety are included into the ISI program; selection of these components is given by design. The ISI program consists of the individual ISI sub-programs developed under the original quality assurance programs (which were titled as Individual Quality Assurance Program) and according to the documentation of design modifications. Within the ISI sub-programs for SCC, the place of inspection, inspection method with the period (interval of ISI) and acceptance criteria are specified. The results of ISI are regularly evaluated and based on this evaluation, with additional accounting of operational experience, legislative requirements and experience from other operated nuclear power plants, the ISI program is optimized.

The requirements for inspection activities specified in this program are taken into account in the maintenance program.

Within the ISI, the following methods are mainly used: visual testing, penetration testing, radiography, eddy currents testing, ultrasonic testing, ultrasonic thickness measurement, tightness and pressure tests, diagnostic measurements. The range and number of these methods depend on the particular component's importance. On safety-relevant components, NDT methods are qualified with the use of the ENIQ ("European Network for Inspection Qualification") methodology.

Inspections in difficult to access locations or in locations with high radiation exposure are carried out by automated (manipulators and robots) methods. These are usually carried out by maintenance contractors, mostly manufacturers of the monitored equipment or specialized companies with the required qualification.

7. **Continuous monitoring and evaluation of performance and state** – SSC performance and state monitoring are used to evaluate the state and SSC reliability/life durability and includes:
  - Operational monitoring - ensured by the operations divisions according to the relevant operating and managing documentation.
  - Preventive walkdown activities - ensured by the Care of Assets Department under ČEZ\_ME\_1115 methodology.

- Performance and state evaluation - ensured by the Care of Assets department and Technical Support department with the use of data acquired from operational monitoring, from preventive maintenance (including the results of the inspections according to the operational inspections program and revisions according to the Rules of Revision), from the results of the Ageing Management Programs, and from internal and external feedback. The evaluation is carried out on the basis of defined parameters and criteria.

Periodic evaluation of SSC state (summarized in Health Reports of Systems) is the comprehensive form of evaluation.

Enhancement of SSC reliability - On the basis of performance and state evaluation, and the results of the care of assets programs, the non-conformities identified in performance and state are, in a graded approach, recorded, assessed (including possible impact of ageing) and investigated, and the priority and method for their solution are set so as to achieve the required reliability of SSC.

8. **Periodic evaluation of SSC state (Health-report)** - SSC performance and state are comprehensively observed on the basis of the set parameters linked to reliability management (safety, deficiencies and operational events, physical condition, economic indicators, the implementation of specific projects, ageing assessment, and reliability assessment). On the basis of periodic assessment, the maintenance program is optimized, while keeping the graded approach. This periodic assessment of the state and performance is carried out for technological systems and components.
9. **Integration of ageing management into the process of the Maintenance of Assets** – activities related to ageing management of specific components (category A) and ageing-related problems finding are implemented in the NPP Ageing Management process. They are tied to the care of assets and are ensured by NPP Long-term Operation Preparation Department including implementation of Ageing Management Programmes.
10. **Monitoring and recording of SSC risks** – in the form of the Health Report of Power Plant.

Article 6 (c) – Assessment and improvement of nuclear safety

#### 4.1.3 Legal framework

Pursuant to the provisions of Art. 49 para 1 letter b) point 1 of the Atomic Act, the license holder shall ensure that, from the commencement of construction to decommissioning, the nuclear installation meets the safety objectives, safety requirements and principles of the safe use of nuclear energy. Furthermore, pursuant to the same Art., the license holders shall conduct safety assessment, based on which the license holder shall constantly increase the level of nuclear safety as far as reasonably practicable; and also shall ensure that the safety assessment is verified by persons who did not directly participate in the safety assessment,

Pursuant to the provisions of Art. 48 of the Atomic Act, the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security shall be regularly, systematically, comprehensively and verifiably assessed by the license holder during the life cycle of a nuclear installation and the results of safety assessment shall be applied in practice. The verification/assessment shall be documented. The content of the documentation for the activity to be licensed is specified in Annex 1 to the Atomic Act.

The licensee must also investigate without delay any breaches of the Atomic Act, take corrective action and prevent the recurrence of such situations.

The licensee must assess the Atomic Act safety requirements, which among others explicitly introduces safety functions and principles of the safe use of nuclear energy. In its Article 45 the Atomic Act requires, that nuclear safety, radiation protection, radiation situation monitoring, radiation extraordinary event management, and security of nuclear installations must be ensured throughout the life cycle of a nuclear installation by means of defence-in-depth.

Specific design requirements related to defence-in-depth are set up in the Atomic Act implementation Decree No. 329/2017 Coll., on Design requirements for Nuclear Installation. Article 6 and 7 of the Decree specify requirements on implementing the defence-in-depth concept. The Decree, among others, requires:

- the application of defence-in-depth for all activities relevant to nuclear safety,
- the creation of a series of successive physical safety barriers backing up each other that are placed between radioactive materials and the surrounding area of the nuclear installation,
- systems, structures and components and procedures for the application of the safety functions to protect the integrity and functionality of physical safety barriers at the various levels of defence-in-depth.

Complementary to defence-in-depth application, the Atomic Act and its implementation regulation No. 329/2017 Coll., require that a nuclear installation with a nuclear reactor must, from the commencement of construction to decommissioning:

- allow for, if necessary, immediate and safe shut-down of the nuclear reactor and for maintaining it in a subcritical state,
- prevent any uncontrolled development of a fission chain reaction,
- make it physically impossible for a critical or supercritical state to develop the predefined envelopes,
- ensure dissipation of the heat produced by nuclear fuel and technological systems, and
- ensure necessary shielding and
- prevent the release of a radioactive substance and propagation of ionizing radiation into the environment.

Moreover, based on the Atomic Act, everyone who uses nuclear energy must collect, sort, analyze and document experience and safety-relevant information by a feedback system in ensuring nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security and take into account the importance of the interaction between personnel, technology and organizational arrangements. This information is crucial for conducting assessments.

Safety assessment must be conducted, in the first place, the by the licensee. Art. 48 of the Atomic Act defines the obligation to conduct the following types of safety assessment:

- deterministic safety assessment,
- probabilistic safety assessment, in the case of a nuclear installation which is not a research nuclear installation that has a nuclear reactor with heat dissipation exceeding lower than 2 MW and is not a radioactive waste storage facility, spent fuel storage facility or radioactive waste disposal facility,
- periodic safety assessment,
- continuous safety assessment, and
- special safety assessment.

The assessment must be documented. Based on the safety assessment, licensee must constantly maintain and increase the level of nuclear safety as far as reasonably practicable (Art. 49 para 1 letter e) of the Atomic Act).

The decree No. 162/2017 Coll. sets out criteria for the assessment of a nuclear installation during different stages of its service life. It also defines the content of the assessment documentation.



The requirements related to assessment and referred to in the Atomic Act and its implementation decrees are supplemented by SÚJB's guides. The guides are not legally binding; however, they provide recommendations on how to conduct assessments, reviews and testing. The guides are based on international best practice, the IAEA Safety Standards and WENRA recommendations as well. They include for instance topics as follows:

- BN-JB-1.4: Ageing Management for Nuclear Power Plants;
- BN-JB-2.9: Periodic Safety Review;
- BN-JB-2.5: Probabilistic Safety Assessment;
- BN-JB-5.3: Maintenance, Operational Inspections and Functional Testing;
- BN-JB-2.10: Deterministic analysis of events;
- BN-JB-2.2: Deterministic analysis of DEC-A.

The safety assessment and its results are, in compliance with the Atomic Act, reviewed by the SÚJB, both analytically and through inspection activities.

#### **4.1.4 Examples of actual practice for systematic assessment**

ČEZ a. s., a holder of the license for the operation of the Dukovany and Temelín NPP, the SÚRAO, the Czech Technical University, the CV Řež and the ÚJV Řež bear the primary responsibility for nuclear safety and radiation protection of their nuclear installations and storages. The arrangements for nuclear safety, radiation protection and emergency management have the highest priority of the license holder. The entire management system serves for maintaining the desired level of safety that includes the essential elements of safety management and operational feedback used for verification of the level of safety.

The license holder has established his own management system, used for implementation of the requirements of the Atomic Act. In accordance with the Management System Programme including elaborated duties and responsibilities established in other license holder's documents, the control of ensured compliance with approved working procedures and deadlines of periodic tests are ensured. In case of events with an impact on nuclear safety and radiation protection, in accordance with the established system the registration and investigation of the event and then determining of corrective actions to prevent recurrence of the event is initiated in accordance with the established system. This entire process is programmatically and systematically evaluated and monitored by inspectors of state supervision.

#### **4.1.5 Example of actual practice for periodic safety review**

At the Dukovany and Temelín NPPs the comprehensive assessments of a safety level are executed regularly in ten-year intervals, as globally established by the Periodic Safety Review (PSR). These reviews are executed fully in compliance with the requirements of IAEA instruction NS-G-2.10. PSR evaluates fourteen areas (Power Plant Design, Actual Status of Systems, Structures and Components, Equipment qualification for ambient conditions, Ageing of safety important structures, systems and components, Deterministic Safety Analysis, Probabilistic Safety Assessment, Potential of Internal and External Risks, Operational Safety, Feedback from operation of other nuclear installations, and science and research results, Organization and Control, Quality Systems and Safety Culture, Procedures and Regulations, Human Factor, Emergency Preparedness, Radiological Environmental Impact).

The results of the evaluation are stated in final Periodic Safety Reports of all evaluated areas and in a summary report that was, along with the list of strengths, corrective measures and time schedule of their performance, transmitted to the SÚJB. The results of PSR provided, among others, the basis for preparation of the renewal of operational licenses of the units of Dukovany NPP and Temelín NPP after completion of the previous ten years of operation.

#### *Overview of completed/prepared PSRs:*

Last PSR of Dukovany NPP was executed in the years 2005 and 2006. The PSR of Temelín NPP after 10 years of operation was executed in the years 2008 - 2010. A comprehensive evaluation under PSR identified appropriate opportunities to improve the safety. A major part of corresponding corrective measures is in the phase of implementation or preparation for implementation, and would be implemented even regardless of subsequent evaluation within the Stress Tests. The completed PSR envisages implementation of approved measures for Dukovany NPP Unit 1 by 2015, for Temelín NPP by 2018.

The SÚJB evaluates the Final Reports of the PSR of individual units, issues its positions to the PSR findings and to the list and adequacy of corrective measures and periodically on the finalization of each individual year of operation, and checks the compliance with the time schedule and content of the corrective measures. Any changes in the time schedule for implementation of the corrective measures are evaluated and discussed with the license holder and the adopted technical and administrative measures are approved.

#### **4.1.6 Example of actual practice for continuous improvement of nuclear safety**

At the Dukovany and Temelín NPPs, the operational feedback system permitting to benefit from their own operating experience and experience from foreign nuclear power plants is applied. Both NPPs regularly obtain information about events from the IRS (Incident Reporting System) and WANO networks and from operators in Slovakia (the same type of reactors).

The entire process, which includes an examination of the operational event causes, remedial measures identification and feedback of experience from these events, is ensured by specific departments in the relevant NPP, and is described in relevant controlling documentation of individual NPPs.

Documentation includes methods for gathering information on operational events, their registration, investigation procedures, and analyses of their causes, establishment and adoption of remedial measures for these events, monitoring their implementation and evaluation of operational events feedback effectiveness and trends. Besides, it also includes obligation and procedure for the transfer of NPP's own experience to other NPP operators and for the dissemination of foreign and its own operational experience within the plant.

The events are evaluated according to the INES international scale. A head of the Feedback section is responsible for the event-related investigation. This section coordinates the whole process of events investigation in the power plant, but other plant specialists from special departments are also involved in the process.

For regular evaluation of operational feedback effectiveness of experience from its own operational events, the main criterion is event non-recurrence for the same root causes. Repeated events or problems are regularly evaluated by ČEZ, a. s. NPPs management in annual reports of the operational events and possible further measures are proposed. For tracking problematic areas, the trends, precursors and coding of event causes are used. This is elaborated as a part of the annual report "Feedback from internal events".

Three types of events are distinguished in the monitoring system (process):

- Events important from the viewpoint of nuclear safety (INES classification higher than 0). These events shall be discussed by the Events Investigation Commission established on the relevant NPP, and the root causes together with the adopted corrective measures are regularly evaluated by SÚJB inspectors.
- Minor (less significant) events (INES classification always less than 0, classified out of scale). These events are investigated within the work order of the corresponding departments.

- Events without consequences ("near misses"). These events are treated in the same way as the events in the preceding paragraph.

The Events Investigation Commission, which is established as the advisory team of the executive director of NPP for identification of causes and for corrective measures and conclusions from the events investigation in individual power plants, confirms at its regular meetings the completeness of the investigations of safety related event causes and adopts corrective measures for the elimination of their causes for the purpose of prevention of their repeating. The most severe events at power plants of ČEZ, a. s. (nuclear, as well as thermal and water power plants) are discussed at the Failure Commission of Production Division and the experience from these events is transmitted back to all power plants. Both commissions are elements of the safety self-assessment of the license holder, and their activity and results are subject to independent supervision and evaluation by special departments that are not responsible for operating results. In accordance with the law, the SÚJB supervises this process, and in some cases of important events, inspects the progress of examination and assessment of sufficiency of remedial measures taken in the course of event management.

Article 6 (d) - Licence holder`s management system

#### **4.1.7 Legal framework for Management System**

The principle of priority to nuclear safety has been fully incorporated into the Atomic Act. Article 5 of the Act establishes general conditions for the performance of activities related to the utilization of nuclear energy.

Art. 5 para 2 letter a) of the Act unequivocally establishes that: "Everyone who uses nuclear energy, manages a nuclear item or performs activities in exposure situations shall, as a matter of priority, ensure nuclear safety, safety of nuclear items and radiation protection, while respecting the present level of science and technology and good practice,". The implementing decree to the Act, Decree No 408/2016 Coll. requires the licensees (but also their suppliers) to introduce and maintain a management system with the aim of ensuring and increasing the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security. (These requirements have developed from earlier requirements on introduction of quality assurance system, which were originally defined in the Act No. 18/1997 Coll. and its implementation Decree No. 132/2008 Coll.).

At present, based on the newly defined requirements, the licensees must in the context of their management systems assure the following:

- identify processes and activities, including processes that have outputs whose conformity with the requirements placed on them cannot be fully verified,
- manage and perform processes and activities methodically so that they effectively contribute to ensuring and increasing the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, and security,
- document the management system, including processes and activities, and follow the management system documentation,
- determine the organizational structure and interactions between organizational units, personnel and other persons,
- provide the internal bodies or personnel with general obligation to ensure introducing and maintaining the management system,
- define the rights and obligations of personnel and methods of communication between them so that they effectively contribute to ensuring and increasing the level of nuclear safety,

- radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security,
- create a plan for ensuring and increasing the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security, and document the planning,
  - make changes to the management system in a manner ensuring integrity of all areas of the management system,
  - assess the efficiency of the management system, including processes and activities and changes to them, and
  - integrate all requirements that could be used for ensuring and increasing the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security.

The SÚJB checks the compliance with the Atomic Act and its implementing regulations. The Office carries out inspections at the premises of licensees (and other persons specified in Atomic Act) during which inspectors check whether licensees (and other persons) are observing provisions of the Act and implementing regulations, and whether they are keeping to the subject and scope of the issued license, including specified conditions.

Within the scope of its authority and competence, the SÚJB performs observation and oversight of the "priority to safety" principle, as established by the Atomic Act, in the course of all activities related to the utilization of nuclear energy. All organizations, which participate in the design, manufacturing, construction and operation of nuclear power plants, are subject to SÚJB inspections that especially assess the management approach to safety related issues and how individuals performing safety related activities are motivated in respect to this issue.

#### **4.1.8 Example of the management system implementation in the NPP operating organization**

In accordance with the valid legislation as well as the international obligations of the Czech Republic, ČEZ, a. s. accepts responsibility for safety assurance at its nuclear power plants, for individual and public protection and protection of the environment. In order to fulfil this responsibility, the company has undertaken to create and further develop conditions for nuclear safety with sufficient human and financial resources, effective management structure and control mechanisms.

The company keeps the development of the conditions for fulfilment of the safety obligations (strategic goals) above, in compliance with Safety and Environment Protection Policy and Quality Policy of ČEZ, a. s., internally drafted and declared by the decision of the Board of Directors of the company.

Targeted fulfilment of the obligation to put priority on safety and environment protection over the requirements of production, as well as fulfilment of the obligation concerning continuous improvement of safety culture (as an integral part of company culture), includes yearly update of the strategic tasks of the Chief Executive Officer and Managing Director of the Production Division of ČEZ. The Action Plan for safety culture improvement is being updated regularly as well.

The basic framework of the powers and responsibilities and the method of assurance of the activities performed for fulfilment of all safety obligations within the company, are defined by the company rules "Organization structure, the role and powers of particular departments" and by the "Manual of integrated management" along with the related company directive "Safety Management of ČEZ, a. s."

The above-mentioned controlling documents describe, in terms of organization and processes, the control mechanism of activities in the fields of performance of activities important to nuclear safety.

One of the tools for systematic assessment of the level of nuclear safety is a set of safety indicators, which characterize the trends of the nuclear safety level and the radiation protection level in nuclear power plants during predetermined time periods (week, month, year). Through regular safety evaluation reports, the company's managers obtain the feedback from the assessment of safety requirement implementation efficiency.

To solve the most significant (principal) safety issues related to the operation of nuclear installations, advisory bodies of the Chief Operation Officer and Production Manager actively support ČEZ at its top management levels. Selected representatives from ČEZ decision making departments and from joint sections of the company as well as invited specialists do work in other advisory bodies (e.g. Committee on the Safety of ČEZ, Nuclear Installations and Safety Committee of the Production Section). The basic function of these committees is to evaluate the safety level of nuclear installations, to identify potential safety related problems and recommend optimal solution.

Comprehensive assessment procedures have been developed for evaluating organizational changes (according to the requirements of the "Categorization and safety assessment of organizational changes within ČEZ, a. s."). The proposed modifications (and their safety related assessment) are submitted to the SÚJB for independent evaluation before their implementation. All planned changes are always subject to safety related analysis.

Article 6 (e) - On-site emergency procedures and severe accident management guidelines

#### **4.1.9 Legal requirements for prevention of accidents**

The legislation valid in the Czech Republic for the accident prevention and accident management and its implementation is compliant with the current IAEA requirements on safety. The operated Dukovany NPP and Temelín NPP are designed with respect to the defence-in-depth concept, in line with the requirements on preventing radioactive substance releases, preventing accident occurrences and mitigating their radiation consequences. Applied technologies at both NPPs are either well proven or verified by the tests combined with computational analyses.

Specific legal requirements related to emergency and accident management and prevention of accident conditions are enacted by Article 49 of the Atomic Act. The licensee is obliged to ensure, maintain and practice radiation extraordinary event management measures and procedures set out in the on-site emergency plan and internal regulations, and to introduce processes and activities the purpose of which is to prevent accident conditions at a nuclear installation from escalating and mitigate their consequences. The license holder is also required to document all operational occurrences including abnormal operation and accident conditions should they occur.

Design of the nuclear installation plays a crucial role in dealing with abnormal occurrences and accident conditions. Design requirements related to prevention of accident conditions and their mitigation are included in the Decree No. 329/2017 Coll., on Design Requirements for Nuclear Installation. The Decree also contains a number of specific technical requirements for the reactor control and safety systems (for instance: allow for, if necessary, immediate and safe shut-down of the nuclear reactor and for maintaining it in a subcritical safe state; prevent the uncontrolled development of the fission chain reaction, make it physically impossible for a critical or supercritical state to develop outside the inner part of a nuclear reactor, ensure dissipation of the heat produced by nuclear fuel and technological systems, and prevent the release of a radioactive substance and propagation of ionizing radiation into

the environment), reactor cooling systems, containment, energy supplying systems and their backup, including requirements for functioning during normal and abnormal operation and under accident conditions, including external events which may be realistically expected to occur based on the history of the given site (see also the SÚJB webpages <http://www.SUJB.cz/>).

The Decree No. 329/2017 Coll. defines that nuclear installation design should, in the context of ensuring compliance with the defence-in-depth concept, set out requirements for

- creating a series of successive physical safety barriers that are placed between radioactive materials and the surrounding area of the nuclear installation,
- systems, structures, components and procedures for the application of the safety functions to protect the integrity and functionality of physical safety barriers at the various levels of defence-in-depth and
- prevention of the occurrence of a radiological emergency using physical safety barriers.

Decree No. 21/2017 Coll., on Assuring Nuclear Safety of Nuclear Facilities, contains a number of specific technical requirements for processes and activities aimed at preventing the development of accident conditions in a nuclear installation and to mitigate their consequences, i.e. accident management system (see also the SÚJB websites <http://www.sujb.cz/legislativa/atomove-pravo/>)

In relation to the accident management system, the Decree No. 21/2017 Coll. specifies license holder`s duties as follows:

- objectives to be set up and strategies to be implemented for accident conditions management based on safety assessment and design requirements for a nuclear installation;
- a set of measures to be implemented for accident conditions management in line with the objectives and strategies for accident conditions management, which have to include:
  - technical measures for accident conditions management, including means to obtain and transmit information on a nuclear installation; and
  - organizational measures for accident conditions management;
- the documentation package to be created and maintained for accident conditions management;
- staff ensuring accident conditions management to be trained in accident conditions management; and
- analyses to be undertaken to develop the strategies for accident conditions management and the results of such analyses have to be used for this development.

The Decree No. 21/2017 Coll. also requires the accident management system must:

- allow for management of accident conditions in a nuclear installation initiated in all conditions of a nuclear installation;
- allow for management of accident conditions encountered in all nuclear installations situated in the same area for siting of a nuclear installation at once;
- allow for management of accident conditions, during which a nuclear reactor and an irradiated nuclear fuel storage pool are affected at once;
- include rules for the mutual support among nuclear installations with a nuclear reactor situated in the same area for siting of a nuclear installation for accident conditions in one of them in order not to compromise the nuclear safety of a nuclear facility fulfilling the supporting function;
- include an effective link to radioactive waste management or remedy of the situation following a radiological emergency for the area affected by radiological emergency or for its part in order to mitigate the consequences of accident conditions; and
- take account of
  - foreseen environmental conditions including extensive damage to internal or external infrastructure and expected degraded conditions, including radiation conditions, which can be encountered during accident conditions;

- initiating events or phenomena, which can cause accident conditions; and
- human resources and impact of human factor on accident conditions management.

In addition, SÚJB formulated a series of conditions in licenses for further operation for all units aiming at reaching an adequate level of technical and organizational measures for coping with severe accidents management and for preventing radiation accidents.

Radiation protection is regulated by the Atomic Act and its implementing Decrees, namely the Decree No. 422/2016 Coll., in order to transpose requirements of the Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom. These requirements must be implemented in the nuclear installation design, as well, as requires Articles 48 and 49 of the Decree No. 329/2017 Coll., and thus contribute to accident management at the nuclear installation.

#### **4.1.10 Legal requirements for mitigation of accident consequences**

Article 209 of the Atomic Act lays down following responsibilities and obligations of regulatory authority in emergency management.

The SÚJB:

- establishes the emergency planning zone,
- participates in managing the country monitoring network and in case of the occurrence of an accident exposition situation the SÚJB initiates and manages the accident monitoring,
- ensures and conducts drills and emergency exercises for radiation extraordinary event response,
- in cooperation with the Ministry of the Interior, draws up the national radiation extraordinary event plan,
- in the case of a radiation accident, provides preliminary information to the general public concerning protective measures and steps that need to be taken to ensure radiation protection; the preliminary information provided shall be up-to-date and constantly available and it shall be provided automatically and repeatedly, at regular intervals and whenever a significant change occurs,
- issues proposals for urgent protective action or follow-up protective action, in accordance with the national radiation extraordinary event plan and on the basis of the results of the radiation situation monitoring carried out, further specifies or recommends withdrawal of specific protective actions and confirms or further specifies proposals for the introduction of urgent protective action issued by license holders,
- participates, within the scope of its competence, in the provision of information to the general public about the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic outside the emergency planning zone and about the steps and measures to be taken during the various stages of development of the radiation accident,
- participates, within the scope of its competence, in the provision of information about the occurrence and the course of a radiation accident within an emergency planning zone,
- ensures that the competent regulatory authorities of neighbouring Member States of the Euratom are notified of the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic and about the steps and measures to be taken during the various stages of development of the radiation extraordinary event,
- ensures that an international peer review is invited immediately in the case of a radiation accident that has occurred in the territory of the Czech Republic and led to the implementation of protective measures outside a nuclear installation grounds,

- provides information about the adoption of measures to protect the general public in the Czech Republic in the event of a radiation accident arisen in the territory of Member States of the Euratom to the European Commission and other Member States of the Euratom which may be affected by these measures and, in accordance with the Czech Republic's international commitments, provide public access to information thus obtained,
- ensures notification of regional authorities about the occurrence and the course of a radiation accident outside the territory of the Czech Republic and about the steps and measures to be taken in the course of the radiation extraordinary event.

The SÚJB, on a basis of Article 24 and Appendix 1 to the Atomic Act, also approves on-site emergency plan and participates on drafting the off-site emergency plan.

Art. 5 para 1 letter a) of the Atomic Act lays down a principle of prevention of emergency situation. Anyone who uses nuclear energy or performs activities in exposure situations must precede radiation extraordinary events and, if they occur, ensure that radiation extraordinary event management procedures are followed and minimize their consequences. The principles for averting or reducing exposure due to radiation accidents and exposure of people who participate in the mitigating interventions are elaborated in Article 104 and especially in Chapter VIII (Art. 151 to 158) of the Atomic Act.

Pursuant to the Act, the licensee, in order to ensure radiation extraordinary event response preparedness, is among others obliged to:

- elaborate an on-site emergency plan and submit the plan to SÚJB for approval,
- cooperate with State and territorial authorities and with the intervention units of the integrated rescue system to ensure radiation extraordinary event response preparedness in the case of a radiation accident in the emergency planning zone,
- provide supporting documents for the drawing up of
  - the off-site emergency plan, to the Fire Rescue Service of the Czech Republic and regional authorities,
  - the national radiation extraordinary event plan, to the SÚJB and the Ministry of the Interior,
- in cooperation with the competent regional Authority or the Fire Rescue Service of the Czech Republic, ensure that the general public and the integrated rescue system units intervening to radiation accidents in the emergency planning zone are provided with iodine prophylaxis antidotes,
- provide basic information to the general public in the emergency planning zone for the case of a radiation accident and update it regularly; basic information for the case of a radiation accident may only be provided or updated on the basis of an affirmative statement of the SÚJB, the Fire Rescue Service of the Czech Republic and the president of the region,
- acquire, maintain and operate warning system terminals in the emergency planning zone,
- verify, by means of exercises and tactical exercises in cooperation with the competent public administration authorities and integrated rescue system units, the accuracy, efficiency and mutual consistency between on-site and off-site emergency plans and their consistency with the national radiation extraordinary event plan,
- participate in the evaluation of the exercises and tactical exercises and, on the basis of the results of the evaluation, take measures to remedy the deficiencies found,
- draw up an annual report on radiation extraordinary events response preparedness in the course of the activities performed by the license holder and submit it to the SÚJB by 31 January of the following calendar year.



If the radiation extraordinary event occurs, the licensee is among others obliged to:

- immediately initiate a response to the radiation extraordinary event and record the course of the response to the radiation extraordinary event, if the maximum monitoring level has been exceeded,
- immediately warn persons present on the nuclear installation grounds or in the premises of the workplace using a source of ionizing radiation, take measures to protect them and inform the SÚJB of these measures, and, in the case of a radiation incident involving a suspected release of radioactive substances or ionizing radiation out of the nuclear installation grounds or premises of the workplace using a source of ionizing radiation, or in the case of a radiation accident, also inform other authorities concerned and the persons specified in the on-site emergency plan or emergency regulations; in the case of a radiation accident, the warning shall include a proposal for taking urgent protective action,
- immediately notify the SÚJB about the occurrence or suspected occurrence of a radiation extraordinary event and, in the case of a radiation incident involving a suspected release of radioactive substances or ionizing radiation out of the nuclear installation grounds or premises of the workplace with ionizing radiation sources, or in the case of a radiation accident, also immediately inform the locally competent mayors of municipalities with extended authorities and the locally competent president of region through the territorially competent operations center of the Fire Rescue Service of the Czech Republic, other authorities concerned as specified in the on-site emergency plan or emergency regulations, and the neighbouring persons,
- in the case of the occurrence or suspected occurrence of a radiation accident, in cooperation with the Fire Rescue Service of the Czech Republic, immediately start warning the general public in the emergency planning zone and ensure the immediate broadcast of the emergency information; the information shall include the instruction to take urgent protective action in the form of sheltering and application of iodine prophylaxis,
- control, evaluate and regulate the exposure of natural persons participating in radiation extraordinary event response at the nuclear installation grounds or in the premises of the workplace using a source of ionizing radiation,
- propose to the president of the region the taking of urgent measures to protect the general public in the emergency planning zone in the form of evacuation according to the actual or expected development of the radiation accident and according to the results of radiation situation monitoring,
- ensure elimination of the consequences of a radiation incident at a nuclear installation grounds or in the premises of a workplace using a source of ionizing radiation,
- cooperate in the preparation of remedial action after a radiation accident in the area affected by the radiation accident.

Details for above enumerated measures and obligations are established by the Decree No. 359/2016 Coll., on Details for Ensuring Management of Exceptional Radiological Event.

Pursuant to the Atomic Act, the NPP operator is obliged to ensure press and information campaign for population preparedness (i.e. issue of the Basic Information for the case of a radiation accident at the NPP, training for representatives of local authorities). The Basic Information for the case of a radiation accident at the NPP is prepared in cooperation of The NPP operator with local bodies of crisis management, Ministry of Interior – GŘ HZS ČR and the SÚJB, is updated once in two years and is distributed to all inhabitants within the emergency planning zone. The manuals contain information on how the inhabitants should proceed after the warning in the emergency planning zone in the case of needed sheltering, application of iodine prophylaxis and on the announcement of preparation for evacuation.

In emergency response, the operator follows its on-site and off-site emergency plans. In response to radiation accident, the operator cooperates closely with the state administration and local authorities, and acts in accordance with the general obligations imposed upon legal persons for the case of response to the crisis situation occurred pursuant to Act No. 240/2000 Coll.

Details and requirements for emergency preparedness in the case of extraordinary events (radiation incidents and accidents) are explained in the National Report of the Czech Republic on Emergency Preparedness and Response under the Convention on Early Notification of Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (March 2014) [3] published on the website <https://www.sujb.cz/en/reports/> and in the implementing regulations related to the Atomic Act as presented in chapter 4.1 and in Annex 1 of this Report.

Article 6 (f) - Obligations of licence holders to provide for and maintain adequate financial and human resources

Obligations of license holders to provide for and maintain adequate financial and human resources to fulfil their obligations with respect to nuclear safety of a nuclear installation are set down in the Atomic Act, Article 49 para 1 letter a) and n) (formerly Art. 18 of the Act No. 18/1997 Coll.). Specifically, the license holder is obliged to:

- letter a) „provide for and maintain the financial and human resources necessary to fulfil the obligations related nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security,” and
- letter n) “determine the qualification requirements for activities relevant to nuclear safety and provide for a system of education, training and practice for the personnel, including a register of the qualifications obtained and their verification with respect to the relevance of the activities performed,”.

Special qualification requirements are imposed on so called “activities of particular relevance to nuclear safety and radiation protection”. They are allowed to be performed exclusively by “selected workers”. Regulation of these issues are included in Articles 31 to 33 of the Atomic Act and in the Decree No. 409/2016 Coll.

Licensees performing activities involving nuclear energy use are obliged to introduce a management system (Art. 29 of the Atomic Act) and in the context of their management systems ensure and make use of the human, technical, material and financial resources, including suitable working environment, which are essential for ensuring and increasing the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, and security.

According to Article 12 of the Decree No. 408/2016 Coll., and in order to ensure the needed qualification of the employee performing processes and activities in the management system it is necessary that:

- the qualification requirements are stipulated, including years of professional experience corresponding to the type and significance of the process and activity the employee performs,
- a system for theoretical preparation of personnel conducting processes and activities must be used,
- a system for practical training of personnel conducting processes and activities must be used and
- the efficacy of the system for theoretical preparation and practical training of personnel conducting processes and activities must be evaluated.

The qualifications of an employee performing processes and activities must be continuously maintained in order to ensure the requirements for processes and activities are met and employee`s performance is effective and of the required quality.

#### **4.1.11 Example of financial provision of nuclear safety enhancement at nuclear installations in the course of their operation**

The documentation of the licensee's – ČEZ, a. s. – in respect of management system includes the commitment to arrange for sufficient financial resources available for assurance of the safe operation of the company's nuclear power plants. This commitment is included in the company's Organization Rules. In connection with the ČEZ, a. s. Safety and environmental protection policy, the provision of sufficient resources for assurance of nuclear safety and personnel protection as well as environmental protection has been described in detail in the relevant control documents.

Safety maintenance and enhancement on the nuclear power plants operated by ČEZ, a. s. are performed in a controlled manner. Financial planning (strategic plan, business plan and annual budget) is carried out in compliance with the Group Management System of ČEZ, a. s.

As for projects (specific actions), business plans and project plans subject to approval at the division management and company management levels of ČEZ, a. s. are particularly prepared, according to the Signature Rules of the company, and further the individual projects are incorporated into the company budgets for the relevant year. Funding for the individual projects is provided from the company's unrestricted sources.

#### **4.1.12 Example of the assurance of financial and human resources for the decommissioning of nuclear installations and management of radioactive waste generated during their operation**

##### *4.1.12.1 Radioactive waste*

Requirements for the management of radioactive wastes, including those generated at nuclear power installations, are laid down in Art. 111 para 1 letter c) and d) of the Atomic Act, which stipulates:

Holders of a license for the radioactive waste management or producers of radioactive waste, if radioactive waste was not handed to the holder of a license for the management of radioactive waste, shall

- letter c) - " bear all the costs associated with the management of radioactive waste, from its generation to disposal; contracts for the transfer of the right of radioactive waste management or transfer of ownership of radioactive shall be made in writing,"
- letter d) -" bear all the costs associated with the radioactive waste management after its disposal, including the monitoring of radioactive waste repositories after their closure and the necessary research and development activities; these costs shall be financed by fees paid to an account maintained by the Czech National Bank (i.e. the "nuclear account"),“.

The financial means to be used to cover costs associated with radioactive waste and spent fuel storage are, in accordance with the Atomic Act, deposited by the waste generating bodies to an account, held by the Czech National Bank, on the so-called "Nuclear Account". The amount and method of payments to the Nuclear Account are determined by the government of the Czech Republic through its Regulation. The Nuclear Account, which is part of the state financial assets, is administered by the Ministry of Finance. The funds of the Nuclear Account shall only be used for the purposes specified by the Atomic Act.

The Radioactive Waste Repository Authority (SÚRAO) was founded by the Ministry of Industry and Trade as the organizational body of the state established to carry out activities related to radioactive waste final disposal. Activities of the Radioactive Waste Repository Authority are carried out under by a government approved statute, budget and the annual, the three-year and the long-term plans of activities. To cover the activities of the Authority, the Ministry of Finance transfers financial resources

from the Nuclear Account to a separate account of the Authority, always based on the plan of activities of the Authority, approved by government and on its planned budget. Such resources together with the income from Authority operations are the subject of an annual Nuclear Account settlement.

Radioactive waste management in the nuclear power plants of ČEZ, a. s. is executed by separate organizational departments (their activities also include the issue of cold waste, decontamination and technical issues concerning decommissioning) integrated into Safety Section in the Production Division.

#### *4.1.12.2 Decommissioning*

The basic obligations of a licensee as specified in Art. 51 to 54 of the Atomic Act include the obligation to evenly create financial reserves for the preparation and actual decommissioning of nuclear installations. The amount of this reserve shall be established based on the decommissioning plan, approved by the SÚJB, and based on the estimate of the costs for given decommissioning technology and verified by the Radioactive Waste Repository Authority. The method of creating the reserves is governed by a separate legal regulation, issued by the Ministry of Industry and Trade of the Czech Republic. The creation of reserves is controlled by the Radioactive Waste Repository Authority. Currently, proposals for the decommissioning methodology have already been approved for Dukovany and Temelín NPPs and the Spent Fuel Storage Facilities (Interim Spent Fuel Storage Facility Dukovany, Spent Fuel Storage Facility Dukovany and Spent Fuel Storage Facility Temelín). Monetary reserves for decommissioning are created in compliance with legal regulations for all nuclear facilities operated by ČEZ, a. s. The funds for decommissioning nuclear installations are kept on a blocked account and can only be used for preparation and implementation of decommissioning.

The issue of decommissioning documentation preparation is assured at the license holder – ČEZ, a. s. by a permanent multi-job work team consisting of experts from the Production and Administration Division whose knowledge and experience can be utilized in the preparation of a decommissioning plan. In terms of organizational system, the team members are the representatives of the following departments: Fuel Cycle, Safety, Central Engineering and Analytical Support of Production Division. The team covers technical, financial, investment and organizational issues of decommissioning, including the issue of assurance of the relevant human resources. Establishment of the team and all activities performed in this field are executed in compliance with the requirements for quality assurance adopted within ČEZ, a. s. and included in quality assurance programme for nuclear activities.

#### **4.1.13 Role of the regulatory body in the human factor assessment**

The SÚJB systematically monitors the impact of individual's and organization performance on the operational safety. Conclusions of the plant's so-called "Failure Commission" are discussed at regular meetings. In this respect, the SÚJB particularly reviews whether the events with contribution of human and organizational erroneous actions were investigated in sufficient detail, whether corrective actions address determined causes so that recurrence of the events is prevented and whether such corrective actions are implemented in the proper and timely manner. In particular cases, a special inspection related directly to a certain event with significant contribution of human and organizational factors can be carried out. The SÚJB further evaluates separate reports sent on an annual basis, which include the trend analysis of events with contribution of human and organizational factors by selected aspects.

The field of human factor is also a separately evaluated element within PSR.

A system of verification of special professional capability for selected workers of nuclear installations is instrumental in the prevention of human error occurrence. In accordance with the Atomic Act (the SÚJB competence in Art. 31 to 33 of the Atomic Act) the SÚJB shall establish for this purpose an Examining Board and identifies activities with immediate impact on nuclear safety. Verification of special professional capability for selected workers is carried out in form of an exam before the Examining Board.

## 5 Article 7 - Expertise and skills in nuclear safety

Licence holders

### 5.1.1 Legal requirements

Art. 25 para 1 letter d) of the Atomic Act introduces the following general obligation to the licensee: *"ensure that activities of particular relevance to nuclear safety and radiation protection are performed by selected workers,"*.

According to Art. 49 para 1 letter n) the licensee is also obliged to: *"determine the qualification requirements for activities relevant to nuclear safety and provide for a system of education, training and practice for the personnel, including a register of the qualifications obtained and their verification with respect to the relevance of the activities performed,"*.

Assessment by the SÚJB over these licensee's obligations is provided, among others, through documentation that must be submitted with an application for a license (and later kept updated and re-assessed). Namely there are two documents with this relevance (for operational license and others):

- list of activities relevant to nuclear safety and description of the system of education, training and exercises for the personnel, including a description of the qualifications of the personnel,
- description of the system of training for selected workers.

Preconditions for the performance of activities of particular relevance to nuclear safety are established by the provision of Art. 31 to 33 of the Atomic Act. Such activities may only be performed by persons ("selected workers") who are physically and mentally fit, with professional competence verified by the Examining Board and to whom the SÚJB has granted authorization for the concerned activities.

Professional training of the selected workers of nuclear installations can only, according to Art. 9 para 6 of the Atomic Act, be organized by a physical or legal entity based on a respective license granted by the SÚJB. The documentation required for the issuance of such a license is listed in an Appendix 1 to the Atomic Act., and consists of:

- evidence documenting the applicant's organizational and technical competence,
- evidence documenting professional competence of the applicant's personnel,
- evidence documenting the method of training.

The Decree No. 409/2016 Coll., in compliance with the quoted provisions of the Atomic Act, specifies activities of particular relevance to nuclear safety and radiation protection, requirements for qualification and professional training, method of verification of special professional competence and authorization process of the selected workers, as well as the format of the required documents to obtain a license for the training of selected workers.

The above-mentioned legal regulations have been accompanied with the Safety Guide BN JB-1.2 issued by the SÚJB in July 2019. It specifies professional education and training of personnel for the performance of work activities (positions) at Czech nuclear installations in more details. The Guide sets down criteria and provides methodical guidelines for the management and execution of training of employees of nuclear installation, operators and employees of legal and physical entities whose activities (positions) at nuclear installations are important for nuclear safety, with the objective to minimize risks caused by human failure.

### 5.1.2 Application of legislative requirements to the holders of licenses for the operation or construction of nuclear power plants

The only guarantor of personnel training, from the Atomic Act viewpoint, within ČEZ, a. s., is the NPP Training Section, which is a part of the NPP Training Centre section within the ČEZ Production division. The main purpose of this section is to provide professional training to personnel from both power plants and training to external suppliers. The section is also, in accordance with the internal control documents of the company, responsible for the fulfilment of a concept, strategy and system of professional training of personnel in the area of nuclear activities in ČEZ, a. s.

Within the meaning of personnel training, the activities are carried out in three training and educational centers (in Brno, at Dukovany NPP and at Temelín NPP), which are incorporated in the NPP Training Section.

The respective managers at all management levels are responsible for the professional competence (qualification) of their subordinates. Principles governing the process of professional personnel training in respect to nuclear activities are described in ČEZ internal instruction.

The NPP Training Section, as guarantor of the process, permanently keeps, in accordance with the provision of Art. 9 para 6 of the Atomic Act, the validity of SÚJB license for the training of nuclear installations personnel as well as of selected workers of workplaces with ionizing sources.

#### 5.1.2.1 Example: The concept of qualified personnel training of ČEZ, a. s.

The objective of personnel training is to assure that each individual of a nuclear power plant possesses the necessary knowledge, skills and habits required for achieving, maintaining and developing the relevant professional competence. The fulfilment of this objective is verified by examinations and, for selected functions, formally confirmed by authorizations issued by the employer to perform the concerned activities. For each position, the requirements for education, professional experience, health and psychical fitness, probity and especially for continued professional training of the personnel are established before they start to perform their respective activities.

A significant proportion of employees are university graduates or technical high school graduates. For this reason, the training process at the nuclear power plant focuses on the provision of additional special knowledge in the area of nuclear installations, acquisition of practical professional knowledge and skills necessary to perform the work concerned. Special attention is paid to the units' main control rooms' operators, shift and safety engineers, operation and inspection physicists (selected workers). Their training is always concluded with examinations before the Examining Board (for more details on the Examining Board see chapter 5.1.2.6).

The *personnel training* is further divided into *basic training*, *periodic training* and *professional training*.

The process of personnel training starts with recruitment and hiring. New workers are always selected according to the criteria established in the internal control document "Personnel Selection". The selection process includes verification of health and mental fitness of the employees for their future positions.

The responsible department puts the personnel training system into practice, implements this system and evaluates the given process. The department is fully responsible for the application of new training techniques and means in order to improve the efficiency of personnel training.

The Human Resources Development section administers the central files of personnel qualification maintained for each work activity performed at all departments of the nuclear power plant.

#### 5.1.2.2 Basic, periodic and professional training of personnel of ČEZ, a. s.

The purpose of *basic training* is to acquire or to improve the specific professional capability necessary for the performance of a given work activity. Basic training is obligatory for each employee who performs a work activity important for nuclear safety or radiation protection. Basic training is provided to all new employees and to the employees trained for different work.

The employees are assigned to one of the training groups according to their work activity and professional specialization. From the viewpoint of nuclear safety, the five following groups are defined, for:

- management,
- selected workers,
- employees of engineering departments,
- shift and non-shift operating personnel,
- maintenance personnel.

From the radiation protection viewpoint, three groups are defined:

- selected workers,
- radiological personnel,
- other employees.

The preparation is executed according to approved training programs drafted in co-operation between the guarantor of preparation (Preparation Department of NPP) and particular departments of NPP. The minimum duration of the basic preparation meets the requirements of the Decree No. 409/2016 Coll. The forms of the basic preparation are determined based on training program, preparation group, specialization and qualification requirements of qualification catalogue as follows:

- theoretical/classroom training,
- secondment at the nuclear power plant,
- training at a full-scale simulator,
- examination to obtain a Certificate,
- training for a specific position,
- examination to obtain an Authorization,
- authorization for a work activity.

The individual mutually linked-up parts of theoretical and practical training are combined into modules, and the entire duration of the basic training varies from 6 to 88 weeks, depending on the type of work to be performed after training.

A specific form of the basic preparation is also the preparation for a change in work activity (re-qualification) that is the same as the basic preparation defined by training programs prepared in compliance with the requirements of the Decree No. 409/2016 Coll.

*Periodic training* serves to maintain, update or deepen the specific professional competence of an employee as required to carry out his/her work. Each employee who performs an activity important for nuclear safety or radiation protection is obliged to undergo periodic training.

The forms of periodic preparation are determined based on the training program, preparation group and qualification requirements as follows:

- theoretical/classroom training (training days, training dealing with industrial safety, fire protection, emergency preparedness, access to controlled area, training in physical protection, etc.),
- training at a full-scale simulator,
- training and examination to renewal of Authorization.

The total duration of particular forms of periodic preparation differs according to the type of work activity, and the minimum duration meets the requirements of the Decree No. 409/2016 Coll., ranging from several hours to two weeks (simulator) a year according to the type of work activity.

The purpose of *professional training* is to maintain, update, deepen or improve the specific professional competence of an employee as required to carry out his/her work. Each employee whose work involves nuclear installations is obliged to undergo the professional training. The exposure to professional training is very important for employees who perform activities important for nuclear safety or radiation protection, since the training represents a precondition for continuing validity of the Authorization. The duration of this form of training depends on the type of work activity and may be carried out as a one-off training or long-term course.

#### *5.1.2.3 Training of Dukovany NPP personnel at a simulator*

A full-scope simulator VVER 440 is used for basic and periodic training of Dukovany NPP personnel – a replica of the main control room or a full-scope display simulator, both situated directly at the power plant site.

The replica-type simulator is a high-fidelity copy of the operating personnel workplace in the main control room, with all counters and operating panels, including all instrumentation and information system screens placed therein. The simulation of technology, technological processes as well as the control and management system is performed on a modern system based on SILICON GRAPHICS computers using simulation software supplied by the GSE and OSC companies.

The simulator also includes a separate workplace for the instructors, with the so-called instructors' station, from which the instructors control the simulator and manage the training (set up the initial reactor condition, enter defects of the equipment, and on the operator's request, simulate manipulations performed on the real unit by the operating personnel, etc.). Communication between the training main control room staff and the instructor is via a closed circuit telephone line. The instructor has also a camera system with a recording device at his disposal as well as a multiple-function classroom for evaluation of the training and theoretical part of teaching.

For training there is a display version of the simulator at disposal. In this version, the results of computational model are represented in virtual form of the main control room on computer screens. Within the I&C System Renovation and Design Margins Utilization projects, the models on both simulators are gradually updated in such a way that both re-qualification training of operative personnel for newly implemented systems and periodic training for the personnel of particular units before and after upgrading will be assured. The training is organized in such a way that most courses will be executed at a full-scale simulator.

#### *5.1.2.4 Training of Temelín NPP personnel at a simulator*

The concept of training provided to the qualified personnel at Temelín NPP essentially follows the pattern used at Dukovany NPP.

The training of Temelín NPP personnel is performed at a full-scale VVER 1000 simulator on the site.

The workplace of operators has been designed identically with the real main control room and the construction part of the simulator hall has been adjusted accordingly. The simulation of technology and technological processes is performed on a modern system based on Silicon Graphics computers. The information and control system of the simulator for operators is a customized WDPF system supplied by the Westinghouse Company. This company also supplied counters and panels, including instrumentation, for the full-scale simulator; identical counters and panels are used in the main control room.

The training is controlled from the instructor station and the communication and recording device is also available. Part of a full-scale simulator is also a multiple-function classroom used for the needs of theoretical teaching and training evaluation.



A display version of the VVER 1000 simulator has also been developed at the Temelín site, which is currently used both for training and for engineering purposes.

#### *5.1.2.5 Organization and provision of training at simulators*

The operating personnel training at the simulator runs according to the time schedule harmonized with the operation needs in accordance with the programs approved by the SÚJB, including examinations at the simulator.

The training instructors at the simulator at both sites are highly qualified personnel of the NPP Preparation section having minimal experience as a unit shift supervisor or control room supervisor and supplementary educational knowledge. Like control operative personnel, the instructors also have their training program of periodic preparation of training instructors at a simulator whose regular participation is helpful for keeping their knowledge and skills up to date.

Scenarios of all training activities in the given course are prepared, tested and approved for training implementation. The scenarios cover the following operating modes of the power plant reactor building technology:

- unit start-up from cold state to nominal power,
- unit operation at various power output levels,
- unit shutdown from the nominal power to cold state,
- liquidation of error conditions of the unit,
- liquidation of emergency conditions of the unit.

Scenarios of training tasks also contain a list of used and related documents, time requirements for the training, general and specific objectives of the training, description of the unit's initial state, brief theoretical description of the task, lecture scenario (description of the progress of task processed in tabular form), task analysis (instructions for training evaluation and records). Valid operating procedures are available at the simulator personnel workplace to solve tasks to the same extent as in the real main control room.

The simulators are also successfully used for the validation of operating procedures, preparation of tests for emergency exercise simulation and for other analytic activities.

#### *5.1.2.6 Evaluation of training*

Evaluation of training and verification of personnel capability is a precondition needed to establish efficiency and effectiveness of the training programs used for individual forms, stages and types of training. Results of such evaluations provide a feedback through which the contents and scope of the professional training are modified aimed at improving its effectiveness.

A system of verification of special professional capability for selected workers of nuclear installations is instrumental in the prevention of human error occurrence. In accordance with the Atomic Act, the SÚJB establishes for this purpose an examining board and identifies activities with an immediate impact on nuclear safety. Verification is carried out in form of an exam before the Examining Board.

This exam consists of examination at a simulator, theoretical written and oral part, and a practical part, including examination at a simulator. The Examining Board may decide to skip the practical part or to allow the so-called integrated test (oral examination is directly linked to examination at a simulator) in the case of authorization renewal. A failed exam may be repeated by the applicant within a 1-6 month period, whereby the specific date is determined by the Examining Board. Under a respective implementing regulation, an individual who has successfully passed the exam before the Examining Board is granted a selected workers authorization by the SÚJB for a period of 2 to 8 years.

### 5.1.3 Application of legislative requirements to holders of licenses for the operation or construction of research reactors

Principles governing the process of professional personnel training in respect to nuclear activities are described in the internal instruction of the Research Center CV Řež, licensee holder for research reactor operation. This regulation provides for the training of selected workers who perform work activities (duties) with an immediate impact on nuclear safety and radiation protection and whose specific competence was verified by passing the examination before the Examining Board pursuant to Decree No. 409/2016 Coll., and the “List of Work Activities Important to Nuclear Safety, Requirements for Qualification, Vocational Training and Verification Method for Nuclear Installation”.

The training of research reactor operators is divided into the following parts:

- Basic training,
- Periodic training,
- Training after event caused by human error.

#### 5.1.3.1 Basic training

The aim of basic training is to deepen and amend the hitherto acquired knowledge, skills and habits of a worker with specific knowledge and practical experience so as to meet the qualification requirements set out for the actual performance of the work activity considered at the given nuclear installation. New recruits are obliged to complete the basic training in the scope of the relevant approved training programs.

The basic training within the training framework is differentiated in its content and scope, and always contains a theoretical and practical part. A head trainer appoints a trainer and an instructor for each trainee, who ensures, inter alia, that the relevant part of the training follows the curriculum.

The theoretical and practical parts of the training follow the “Curriculum for Training of Selected Workers” enclosed to the internal regulation.

Workers must be directed by an instructor in the practical part. The necessary theoretical knowledge of a trained worker must be verified before the practical part, in particular in the field of the appropriate operating regulations, and limits and conditions for safe operation. To this end, a head trainer must examine workers before the practical part and a record of examination must be made. A trained worker may carry out handling operations on technological systems of a nuclear installation in the practical part only within an approved program, under the direct, constant and immediate supervision by a designated instructor. The worker is unconditionally obliged to follow the instructor's instructions and comply with all safety measures.

A trainer or an instructor is obliged to examine his/her assigned trainee in all cases as specified by the curriculum and make a record thereof.

After the training has been successfully completed in compliance with this regulation and curriculum, and after the examination before the Examining Board has been passed, CV Řež gives a license to the worker to perform the specified work activities. The license is issued by RCR Managing Director or by Department of Research Reactor Operation Director so authorized by the Managing Director.

#### 5.1.3.2 Periodic training

The aim of periodic training is to maintain and deepen the knowledge, skills and habits of a worker to perform his/her current work.

The periodic training includes the performance of work which is not to be interrupted for a period of more than 12 months. The training for authorization renewal is carried out in the form of self-study,

consultations with trainers, and the scope of approximately 50 % of basic theoretical training is expected. This training does not include a separate practical part, because the workers concerned perform their duties during the training.

The selected workers are admitted to the examination before the Examining Board in order to renew the authorization to carry out handling operations at a nuclear installation only after successfully completing the periodic training.

#### *5.1.3.3 Training after event caused by human error*

The training includes summary of the analysis of event, previous preparation (investigation, recording, testimony of the parties), theoretical training and on-the-job training to manage the situation. The training must be completed by workers who caused an event with direct cause with human error. The training must be conducted by a worker responsible for nuclear safety in the presence of direct head of the trained worker.

#### *5.1.3.4 Records of trainings*

Records of basic training are kept for each worker being trained in compliance with the internal regulation and a report is kept of all examinations within this training. A head trainer is responsible for keeping the records and a trainer or an instructor is responsible for keeping the report.

In the case of periodic training, records of all lectures and exercises are kept. A head trainer is responsible for keeping the records. CV Řež is also obliged to keep all documents of the performance of training and of formal qualifications of workers to perform work activities (duties) at the given nuclear installation for a period of at least 10 years after termination of work activities of a worker at this nuclear installation.

### **5.1.4 Application of legislative requirements to the holders of licenses for the operation or construction of training reactor VR-1**

Principles governing the process of professional personnel training in respect to nuclear activities are described in the internal instruction of the Faculty of Nuclear Science and Physical Engineering for Qualification and Training of Personal.

The Department of Nuclear Reactors of the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague, as the operator of the VR-1 training reactor and at the same time, as the training workplace, is responsible for preparing the training programs.

The theoretical training and instructors for practical training of the Department of Nuclear Reactors are primarily covered by workers of the department or experts from practice.

The training of the selected workers has, as the previous ones, three following levels:

- Basic training,
- Periodic training to maintain qualification,
- Training to change the activity in case of change in the performance of activity.

#### *5.1.4.1 Basic training*

In the course of basic training, the acquired knowledge, skills and habits of a worker are deepened and amended with specific knowledge and practical experience so as to meet the qualification requirements set out to obtain an authorization to perform work activities at the VR-1 training reactor.

The basic training consists of theoretical training, internship at a nuclear installation for a duration of at least five weeks and the practical part (on-the-job training) for a duration of at least five weeks.

The scope of theoretical training is divided into five basic groups:

- Selected texts of the theory of nuclear reactors,
- Research and experimental nuclear reactors,
- VR-1 training reactor – description and design,
- Safety of research nuclear reactors,
- Training reactor operation.

The practical training in each group takes at least one week. The practical part is normally preceded by the theoretical training (they can run in parallel), which is usually performed in the form of lectures in a training room, periodic consultations with a trainer and self-study. The practical training is divided into five basic groups:

- Practical information about the reactor,
- Operation of the technological systems of reactor,
- Handling operations on reactor,
- Reactor commissioning and operation,
- Experimental methodologies on reactor.

The training to perform the activity of the selected workers is carried out on the VR-1 reactor always under the supervision of the authorized worker. Only a worker having a valid authorization to carry out the activity of the same or higher level as the one for which the training is conducted may carry out the supervision. The basic training on the VR-1 reactor is necessary to obtain an authorization to carry out the activities of reactor operator or control physicist.

#### *5.1.4.2 Periodic training*

The periodic training is necessary for maintaining or renewing the authorization for existing activities of selected workers of the VR-1 reactor. The periodic training must be completed by all workers of the VR-1 training reactor who carry out work activities on the reactor.

#### *5.1.4.3 Training to change the activity*

The training consists of the theoretical training and on-the-job training for a minimum duration of five weeks. The training to change the activity is necessary for obtaining a authorization to carry out the activities of shift supervisor or commissioning group head.

#### *5.1.4.4 Authorization to perform work activities*

The Department of Nuclear Reactors is obliged to document the professional competence of its instructors to train the selected workers of the VR-1 training reactor to the State Office for Nuclear Safety.

In case of successful completion of all stages of the training, the selected workers are obliged to pass the examination before the Examining Board to obtain an authorization for the performance of activities of particular relevance to nuclear safety in compliance with the requirements laid down in the Atomic Act.

The Dean of the Faculty of Nuclear Sciences and Physical Engineering, as the representative of VR-1 training reactor operator, issues (on the basis of the proposal of the Head of the Department of Nuclear Reactors) an authorization to perform the given work activity to the worker who: successfully passed

the examinations before the Examining Board and obtained the authorization to perform the given activity and complied with other qualification requirements laid down by legislation.

#### *5.1.4.5 Records of trainings*

The documentation of the performance of training and of the acquired qualifications of workers to perform the work activities (duties) on the VR-1 training reactor are archived for a period of at least five years after termination of their work on the reactor. The Head of the Department of Nuclear Reactors and the head of reactor operation continuously evaluate the results of personnel training at all stages of the training.

Regulatory authority

### **5.1.5 National arrangements for the education, training and retraining of the staff of the regulatory authority**

#### *5.1.5.1 Legislative requirements*

According to Art. 200 para 2 of the Atomic Act, SÚJB staff responsible for the inspection are inspectors.

The inspectors are appointed by the Chairman of the SÚJB.

Legal preconditions and requirements on staffing and qualification of personnel, including inspectors, of the SÚJB (and other state administrative bodies) are explained in point 3.1.6 of this report.

#### *5.1.5.2 Description of the education, training and retraining system established by the regulatory authority*

The main training objective is to achieve the necessary qualifications and professional capability and to maintain competence in the activity required for the job-title and scope of work at the SÚJB. Special personnel training and maintenance of its competency is ensured in accordance with the SÚJB internal regulation VDS 039/2001 (rev. 4.1/2020) - System of the preparation, education and evaluation of SÚJB employees .

The internal guideline contents two basic documents - the “Competence Job Profiles” and the “Catalogue of Development Activities”.

The Competence Job Profile describes the individual job (it may be common for a group of jobs), including the mission of this job. The Competence Job Profiles are prepared for all jobs of the SÚJB including regional centers and site workplaces. The requirements for the method of performing work activities define the required competences (including the requirements both for “soft skills” and for “expertise and skills”) and the desirable demonstrations (evidence of fulfilment of the required competence).

The Catalogue of Development Activities (hereinafter referred to as the “Catalogue”) is a list of development activities which serves as a tool for training and development of SÚJB employees in relation to the system of their evaluation. It is structured into two main parts - development of soft skills, and development of expertise and skills. The Catalogue is a live document, which is amended and modified on a continuous basis.

Training activities of the individual SÚJB employees are specified based on the achieved level of their education, duration and level of experience and professional specialisation. At the same time, the strategy and needs of the SÚJB are taken into account, particularly requirements for performance of a particular job. The Individual Plan of Increasing Professional Capability (hereinafter referred to as the „IPOR) is then created for each employee by his/her direct superior.

The entire process of special training is a combination of general and specialized education of all employees irrespective of position or activity performance. The training is divided into the following levels, appropriate for the relevant group of SÚJB's employees:

- Initial training of employees (in a three-month probationary period),
- Training of employees to prepare them for a particular job - adaptation process (preparation for inspector examinations),
- Continual training of employees: including expertise, soft skills and general skills,
- Training of internal trainers and the top management.

#### *5.1.5.3 Initial training of employees*

The initial training is intended for new staff of the SÚJB and is done in the course of a probationary period, usually within three months after starting work. The content and focus of the initial training of an employee are specified by the IPOR. The fulfilment of IPOR is evaluated before the end of probationary period.

The purpose of the initial training is to primarily provide an employee with an overview of the scope and competence of the SÚJB and its position within the state administration in the following modules: locally indicative, specialisation, universal and practical, in the form of consultation at workplaces, participation in training and seminars, self-study, etc.

The decision on continuation or termination of employment of a new employee in the SÚJB is the result of employee evaluation in a probationary period, carried out based on the evaluation of compliance with the requirements of initial IPOR and the evaluation of performance.

#### *5.1.5.4 Training of employees to prepare them for a particular job - adaptation process*

The training within the adaptation process is initiated following the positive evaluation of the initial training and is intended for employees who are expected to perform the duties of inspector or any other highly specialised professional activities. The content and focus of the training within the adaptation process of an employee are specified in IPOR after an evaluation of the initial one.

The purpose of the training within the adaptation process is mainly to inform an employee in detail about legal regulations and internal documentation of the SÚJB, which govern and elaborate the scope of activity of the SÚJB, and relate to the performance of expected duties taking into account his/her past experience. The training focuses on the development of knowledge in technical fields, in particular reactor physics, thermodynamics, engineering, nuclear physics, electrical engineering, I&C systems, and radiation protection.

The adaptation process is completed by successfully passing the inspector examination.

The inspector examination verifies the competence to perform the inspector's duties within the meaning of the Atomic Act and is taken before the internal examining committee of the SÚJB.

Based on the successful completion of the examination, positive evaluation of valid psychological test (psychological tests are renewed at a maximum interval of five years), compliance with the requirement for university education and minimum of three years of professional experience, the SÚJB's Chairperson appoints an inspector for the relevant scope of activity of the SÚJB in compliance with the Atomic Act.

#### *5.1.5.5 Continual training of SÚJB employees*

The purpose of the continual training of employees is to maintain or upgrade their professional qualification necessary for performance of respective duties by the employees.

Continual training includes both professional and “soft” skills. The form and focus of continual training is specified in IPOR, based on the needs of the respective workplace and assignment of an employee to a particular job, i. e. in agreement with the Competence Profile of the job and the Catalogue of development activities, and with regard to the required number of credits for a period of three years.

The training is done in the form of self-study, internal training and seminars, and training, seminars and conferences organized by external entities, postgraduate study, etc. Nuclear safety inspectors performing everyday inspection in NPPs (so called local inspectors) and some inspectors from central office undergo training on full-scope simulator in the Training Centre of ČEZ, a.s.

Participation in the activities is evaluated on a continuous basis, at least once a year. IPOR may be then adjusted based on the evaluation. Final evaluation must be subsequently completed after three years and it is associated with adoption of a new IPOR.

#### *5.1.5.6 Training of internal trainers of the SÚJB and the top management of the SÚJB*

This type of training is intended for employees in the top management positions in the SÚJB and internal trainers, contributing to the internal training of SÚJB personnel.

The content-related focus of the training of the top management must be also in compliance with the Competence Profile of the job.

The training of internal trainers aims both at improving the expertise, in particular according to trainer's specialisation, and at enhancing the level the “soft” skills, especially via new legislation in the scope of activity of the SÚJB and communication skills. For graduates of internal trainer course, the next training should be initiated after five years from the completion of special course.

#### *5.1.5.7 Performance of evaluation*

All SÚJB employees are subject to the performance evaluation system. Part of the work of the head of department is a regular evaluation of performance and fulfilment of IPOR of employees of his/her department.

The purpose and objective of the evaluation are as follows:

- Objective assessment of professional qualities of an employee and recognition of the current level of his/her performance which serve as a basis for the further development and career progression of an employee,
- Recognition of employee motivation to fulfil SÚJB's tasks as set out by the relevant legal regulations and their implementing regulations,
- Improving communication and feedback (superior – subordinate),
- Obtaining information about the employee's approach to his/her professional development and preparation for defining other development activities in IPOR.

## **6 Article 8: Transparency**

### **6.1 Availability of necessary information in relation to the nuclear safety of nuclear installations and its regulation to workers and the general public, with specific consideration to local conditions**

#### **6.1.1 Information provided by the Nuclear regulatory authority (SÚJB) and the license holder**

On its open public website, the SÚJB continuously makes available to the general public (including the workers) updated information on nuclear legislation, status of nuclear safety of nuclear installations, results of monitoring of radiation situation in the vicinity of nuclear installations and on the whole territory of the state (including recommendations if relevant) and also on planned regulatory activities. In addition, SÚJB issues and makes publicly available announcements and specific reports related to anomalies or unusual events at nuclear installations. Based on the Atomic Act requirements, the SÚJB issues once a year a complex annual report on results of its regulatory activities and on the radiation situation in the country. In case of incidents and accidents SÚJB acts and promptly provides information to relevant state and local authorities following legal requirements and specific procedures as further described in the text that follows.

License holder has legal obligation to provide information to workers, local and state authorities and the general public on status of nuclear safety of its nuclear installations during normal operation, incidents and accidents as further described in the text that follows.

#### **6.1.2 Legal framework for making information related to the nuclear safety of nuclear installations and its regulation available to the public and workers**

##### *6.1.2.1 Act No. 106/1999 Coll., on Free Access to Information*

The Act No. 106/1999 Coll. is the basis for making information available to the public and workers. It sets the rules for the provision of information and further regulates the terms of the right to free access to information. Requirements of the Act have been incorporated in internal documents (directives) of the SÚJB.

As per this Act, all bodies of the state administration, including the SÚJB, and public institutions (“legally bound persons”) have the duty to provide information related to their competencies (information means any contents or their part in any form recorded on any medium, particularly the contents of a written record on a document, record stored electronically or an audio, visual or audio-visual record; a computer program is not considered information).

Pursuant to the Act No. 106/1999 Coll. license holders are, as public institutions, “legally bound persons” and thus obliged to provide the public with information on the maintenance of nuclear safety and radiation protection which is not subject to State, professional or commercial secrecy, either through publishing or on a basis of an application.



The legally bound persons provide information to an applicant (i.e. any person and legal entity requesting information) following his/her request or by disclosure.

Pursuant to the Act No. 106/1999 Coll., the SÚJB is obliged to publish the following information at a publicly accessible place at its seat and offices and is obliged to enable making copies of them:

- reason and the way of establishing the SÚJB including the conditions and principles under which it operates,
- description of its organizational structure, the place and the way of obtaining relevant information, where to submit a request or file a complaint, submit a proposal, instigation or any other request or where to receive the decision on the persons' rights and duties,
- place, time for compliance with the request, and the way, where to seek a remedial measure against the decision of the SÚJB on the rights and duties of persons including the explicit list of requirements put on the applicants in this respect, as well as the description of procedures and rules, which are necessary to comply with during these activities, and description of the relevant form and the way and place where such a form can be obtained,
- procedure the SÚJB is obliged to comply with when disposing of the requests, proposals or other requests by citizens, including the relevant times that are necessary to observe,
- list of the most important regulations, according to which the SÚJB particularly acts and makes decisions, which set the right to request information and to provide information, and which regulate further citizens' rights in relation to the SÚJB including the information where and when the regulations are provided for inspection,
- fees for providing information,
- annual report on its activity in communicating information in the previous calendar year,
- exclusive licenses (the SÚJB may grant an exclusive license only if it is indispensable for further dissemination of information and if it is in public interest),
- a superior body's resolution on the fees (in connection with complaints against the fee)
- address of the electronic registry.

#### *6.1.2.2 Act No. 123/1998 Coll., on Access to Information on the Environment*

The Act No. 123/1998 Coll. stipulates namely:

- the conditions of exercising the right to timely and complete information on the state of the environment and natural resources, such as is available to state administration authorities, municipal authorities and juridical persons established, controlled or charged by them;
- public access to the information on the state of the environment and natural resources which these authorities have at their disposal and specifies the basic conditions under which access to information is provided.

#### *6.1.2.3 Atomic Act*

The Atomic Act lays down different SÚJB obligations concerning of information policy. More detailed explanation can be found in point 3.1.8 of this report.

According to Article 5 of the Atomic Act licensees are obliged to ensure nuclear safety, safety of nuclear items and radiation protection while respecting the present level of science and technology and good practice which covers even informing about nuclear installation operation. Specific information obligations are related to the emergency management and stipulated by Articles 156 and 157 of the Atomic Act.

#### 6.1.2.4 International Aspects

The Czech Republic is party to the Convention on access to information, public participation in decision-making and access to justice in environmental matters ("Aarhus Convention") and, among others, the Convention on Early Notification of a Nuclear Accident.

The Czech Republic has also concluded intergovernmental agreements on the exchange of information on nuclear incidents/accidents and other nuclear-related issues with all neighbouring countries (Austria, Germany, Slovakia and Poland), and Hungary. As regards information provided to Austria, there is also a special "hot-line" for providing information on events at NPP Temelín (established within the "Melk Protocol"). The Czech Republic has also concluded number of agreements on cooperation in peaceful uses of nuclear energy and transfer of related information with other countries (USA, Russian Federation, Canada, Republic of Korea, Ukraine, Bulgaria, India and Australia).

The SÚJB has concluded arrangements with partner regulators on the exchange of nuclear safety-related information (with Slovak Nuclear Regulatory Authority ÚJD, Nuclear Safety Authority of Finland - STUK, the Atomic Energy Council of the Republic of China (Taiwan), Supervision of Russia for Nuclear Safety and Radiation Protection, the US Nuclear Regulatory Commission, Canadian Nuclear Safety Commission, State Nuclear Regulation Committee of Ukraine, Hungarian Atomic Energy Authority and Slovenian Nuclear Safety Administration).

### 6.1.3 Communication Strategies

#### 6.1.3.1 Communication of the SÚJB

The Annual Report of the SÚJB is an important document, which the SÚJB submits to the Government and to the public on an annual basis. The report contains very detailed summary of SÚJB activity in the past year. It summarizes the results of analytical and inspection activity in all specialisations of SÚJB activity (nuclear safety, radiation protection, emergency preparedness, nuclear safeguards) and describes major events (failures, safety-related events, exercises, issued licenses, etc.). It also summarizes foreign activities of the SÚJB and provides basic budget information from the past year and information on human resources. The Annual Report of the SÚJB includes a detailed report on radiation situation in the Czech Republic for the last year. Due to the nature of the Annual Report of the SÚJB, the information is provided in a selective manner, after subjective consideration of the Office management.

As in case of others regulatory authorities, the Internet is a vital tool for SÚJB communication. In addition to the basic Czech version of the website, the SÚJB operates a limited English mutation. The Office presents the following information on the website:

- Basic information on the Office, contacts, vacancies, important links
- Issued licenses
- Electronic public noticeboard
- Legislation, including all regulations
- Other documents and publications of SÚJB
- Information from individual fields of SÚJB competence such as:
  - Nuclear safety
  - Radiation protection
  - Radiation situation monitoring
  - Emergency preparedness
  - Non-proliferation of nuclear, chemical and biological weapons
  - Radon

- Information on selected events/activities (e.g. stress tests, emergency exercises, waste management, operation of nuclear power plants, seismic situation monitoring, radiation situation monitoring, etc.)
- News

For major events, as was the Fukushima accident, the SÚJB set up operationally a special website where the public could ask anything relating to this event. SÚJB experts as well as external persons answered here most of the questions asked in a relatively short time. This website had a great resonance in general as well as professional public.

However, Internet and annual report are not the only tools for SÚJB communication.

The SÚJB often cooperates with media. Whenever anything is topical, the chairperson or officials of the SÚJB are asked by national media (television, radio, printed newspapers, Internet) for information. In case of events as Fukushima, commissioning of new NPP units, North Korean nuclear explosions, etc., the representatives of the SÚJB are invited to television/radio/Internet debates within larger media campaigns.

To achieve the highest awareness or transparency possible, the SÚJB attends public hearings in justified cases. Public hearings organized in the Czech Republic and in the surrounding countries during 2011 and 2012 within the EIA study evaluation process for Temelín Unit 3 and 4 can be mentioned as an example. In exceptional cases, where appropriate, public hearings (public seminars) are organized by the SÚJB itself. In recent years, the public hearing on the results of stress tests or quality of welds of the primary circuit of Temelín power plant units can be mentioned.

The SÚJB also regards schools as very important partners in explaining the importance of providing the highest level of nuclear safety and radiation protection. Close cooperation in this respect is with universities. The chairperson and some other workers of the SÚJB lecture to students in the relevant fields on the topics of nuclear safety, radiation protection or non-proliferation of weapons of mass destruction.

Information, which would be submitted by the SÚJB to the Government, regional authorities and to the public in case of emergency, is a special category (see above).

Regular cooperation with the regulatory authorities of surrounding countries contributes to informing the public in the neighbouring countries. Intergovernmental agreements govern the area of provision of information for all four neighbouring countries, both for the category of emergency management and for the category of standard exchange of information for the area of utilization of nuclear energy and ionizing radiation.

Since the 1990s the bilateral cooperation between the SÚJB and the Austrian competent authority in the field of emergency preparation and response (EPR) has been extended. Based on bilateral agreements, the following arrangements have been established: early warning of the neighbouring state, in addition to international early notification obligations (IAEA, EC); information on small events/incidents (including events at Temelín NPP); provision of information on source term and plant status of Temelín and Dukovany NPP; exchange of measurement data of the automatic monitoring networks; monthly tests of data exchange system (ESTE data); yearly bilateral exercise with ESTE data exchange; Austrian participation as observer in the exercises at NPPs Temelín and Dukovany; yearly bilateral expert meetings on exchange of information in the field of radiation protection, EPR and nuclear safety. As a result, in case of nuclear accidents at NPPs Temelín and Dukovany Austria has in principle the same information relevant for off-site EPR as the Czech Republic.

#### 6.1.3.2 *Communication strategy of license holders*

All nuclear installation operators regularly inform public about their activities concerning nuclear safety and radiation protection on their websites and annual reports. Besides it, ČEZ, a. s., as an operator of Dukovany and Temelín NPP has establish communication strategy based on “friendly and mutually beneficial” relationships with the towns, municipalities and population in the vicinity of the power plants. Information centers of the NPP Dukovany and NPP Temelín, located in the immediate neighbourhood of NPPs, visit more than 25 000 per year.

#### **6.1.4 Providing information in emergency situations**

The SÚJB Chairperson represents standard contact with the media. However, if an event involving a substantial increase of demand for information from the public and media occurs (e.g. an incident or accident), an ad-hoc spokesperson or a special contact point is appointed by the Chairperson. He/she is then made available for both the public and media, and appropriate steps are taken so that he/she receives information needed to perform his/her duties. During emergencies, a special team is also established within the SÚJB, and charged with communication with the general public via web pages, phone and also with the media if needed. The team also prepares background material for the highest management of the SÚJB and the Czech Government.

TSOs will also make their staff available to support the regulatory authority – for example in case of the Fukushima Daiichi accident the National Radiation Protection Institute (SÚRO) made one expert fully available for the Czech Embassy in Tokyo (he was helping the Embassy to interpret the information released by the Japanese side, evaluate the risks, provide SÚRO’s own analyses, predictions etc.). Also, the CV Řež, together with the SÚJB, contributed to the communication in this extreme situation – by establishing two new interactive platforms for information sharing = “Fukushima for You” and “Stress Tests”. A number of experts from both institutions participated in responding to questions from the general public (see the “Fukushima Daiichi Experience” below).

Basic rules for exchange/transfer of information in case of emergency are contained in the internal documents (regulations) of the SÚJB on performing the function of the Contact Point for Emergency and on the Communication strategy of the SÚJB.

The basic communication rules have been tested and proved as functional and effective during the emergency exercises “ZÓNA”:

- Press releases were issued by spokespersons of individual exercising entities on a coordinated and regular basis, and are submitted to the press officer of the Ministry of Interior – General Directorate of Fire Rescue Service of the Czech Republic;
  - An information helpline was established for the public, which is operated by trained members of the Fire Rescue Service of the Czech Republic;
  - Each exercising entity issued information (for the public, media) only within its competences and informs on its activities;
  - Each exercising entity hold its own press conferences;
  - Each exercising entity informed on its activity in addressing an extraordinary event on its website.
- During last two “ZÓNA” exercises, the SÚJB reported additionally on its website and Facebook profile on activities carried out by its exercising crisis staff.

##### *6.1.4.1 Provision of Information and Instructions to the Public*

In general, system used for communication with the public and media has to ensure rapid and accurate evaluation of information, prepare outputs, and deliver such outputs quickly and correctly to the public and to the media. This prevents the public and media from receiving incorrect and distorted

information. The system used for communication with the public and media is also regularly tested during exercises at all levels. At all levels of crisis management, the system used for communication with the public and media forms a part of crisis and relevant emergency plans.

The system used for informing the population is tested in both emergency planning zones during regular exercises.

#### *6.1.4.2 Government Level*

Information on extraordinary events that required the activation of the Central Crisis Staff is provided by its professional working group – the Media Group. The head of the Media Group is an authorized employee of the Ministry, whose Minister is the Chairman of the Central Crisis Staff and members are authorized workers of offices, whose representatives are members of the Central Crisis Staff. The Media Group provides the following services to the Central Crisis Staff, in particular:

- Monitoring and information analysis in the course of event development,
- Collection, processing, sorting and delivery of information,
- Collected information analysis and preparation of details for information outputs,
- Information and organizational links to the Office of the Government – Secretariat of the National Security Council, to crisis staffs of the ministries, other central administration offices, administrative offices with national competences, and to regional crisis staffs.

#### *6.1.4.3 Central Administrative Bodies*

The central administrative bodies, through their spokespersons, inform the public, or set up their media groups for this purpose. For example: Ministry of Interior – General Directorate of the Fire Rescue Service of the Czech Republic - sets up a workplace for communications with the public in case of an extraordinary event. This workplace is staffed by trained personnel in communications and equipped with several telephone lines and internet access.

Each central administrative body is responsible for its own information campaign, i.e. publishes its own press releases, holds press conferences, and publishes printed documents containing information for the public and media. Pursuant to the Atomic Act, the SÚJB is obliged to provide information relating to its competence, i.e. the SÚJB is obliged to provide information both on radiation protection in the case of the occurrence of extraordinary radiation events, and on the origination thereof. The SÚJB presents the information, for example, on its website, in its annual reports or ad hoc, as currently needed. The SÚJB also publishes press releases and answers questions from the public. During the Fukushima accident, a special website was created for this event: <http://otazky-fukusima.cvrez.cz>. Since 2012, the SÚJB has also had its own Facebook profile.

#### *6.1.4.4 Regional Offices and Municipalities with Extended Competences*

The regional offices and the municipalities with extended competences inform the public through their spokespersons, or set up their media groups and workplaces for public communication. These workplaces are staffed by trained personnel in communications and equipped with several telephone lines and internet access. Each regional office and each municipality with extended competences are responsible for their own information campaign, i.e. publishing their own press releases, holding press conferences, or publishing printed documents containing information for the public and media. The components of the Integrated Rescue System provide the necessary information, with respect to extraordinary event and to rescue and remedy works in progress, to media and to the public.

#### 6.1.4.5 NPP Operator

The NPP operator informs the public through its spokesperson, publishes its own press releases, holds press conferences, and publishes printed documents containing information for the public and media. The NPP operator sets up a media group as part of the emergency staff. Pursuant to the Atomic Act, the NPP operator is obliged to ensure press and information campaign for population preparedness (i.e. issue of the Basic Information for the case of a radiation accident at the NPP, training for representatives of local authorities). The Basic Information for the case of a radiation accident at the NPPs issued in the form of a calendar, is updated once every two years, and is distributed to all inhabitants within the emergency planning zone. The content of Basic Information meets the requirements set out in Article 11 of Decree No. 359/2016 Coll., and Article 155 of the Atomic Act.

The Basic Information contain information on how the inhabitants should proceed after a warning in the emergency planning zone in the case of needed sheltering, application of iodine prophylaxis and on the announcement of preparation for evacuation. Among other things, the manual uses graphic representations and figures to make this information attractive and understandable. The NPP operator, local bodies of crisis management, Ministry of Interior – General Directorate of Fire Rescue Service of the Czech Republic and the SÚJB cooperate during the process of creation and update of the Basic Information for the case of a radiation accident at the NPP.

In 2018, the system of information of the public via SMS gateway was implemented. The residents in the emergency planning zone have the possibility, after registration on the web portals <https://www.aktivnizona.cz/> for EDU and <https://www.ete.cz/> for ETE, to receive important information about the operation of nuclear power plants via SMS and e-mail. Basic information for the case of a radiation accident at the NPP can be found on these portals.

#### 6.1.4.6 Population Warning in the Emergency Planning Zone

Warning of the public in the emergency planning zone is ensured through a network of terminal elements of a single warning and notification system, which is ensured and operated by the Ministry of the Interior General Directorate of Fire Rescue Service of the Czech Republic. Warning of the public in the emergency planning zone is performed at the decision of the shift engineer or the Head of ECC immediately upon prompt notification of a radiation accident. The shift engineer (or the Head of ECC) issues a request to start the single warning and notification system in the emergency planning zone through the Regional Operation Information Centre of the Fire Rescue Service (for EDU, through the Operation Information Centre of the Fire Rescue Service of the Vysočina Region; for ETE, through the Operation Information Centre of the Fire Rescue Service of the South Bohemian Region).

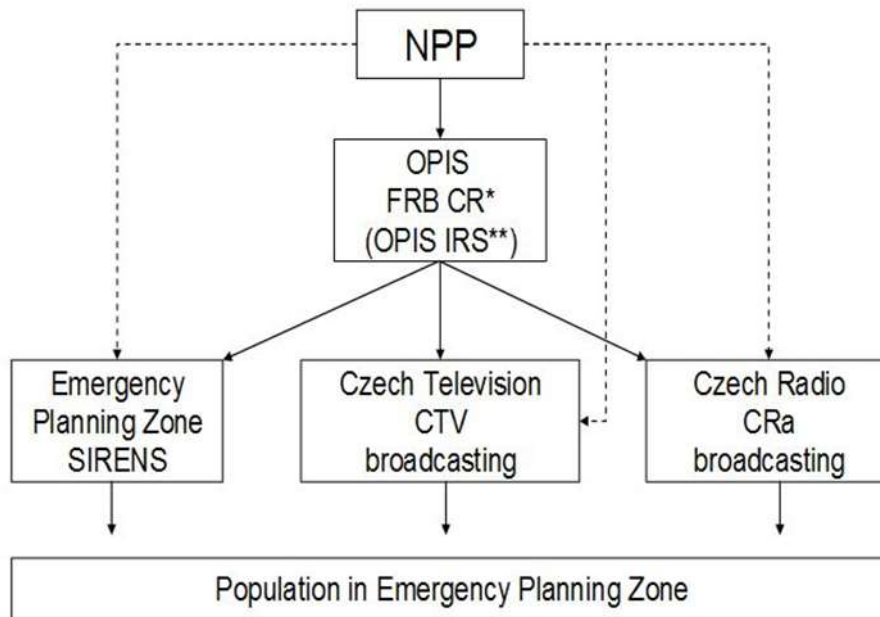
In case of impossibility to transmit information or impossibility to start the warning and notification system in the emergency planning zone from the competent Regional Operation Information Centre of the Fire Rescue Service, the shift engineer (or the Head of ECC) shall issue an order to start the warning and notification system in the emergency planning zone from the backup command workplace at the NPP. In case of failure of the remote warning system in the territorially competent Regional Operation Information Centre of the Fire Rescue Service and at the NPP, there is an alternative method of warning the public in the emergency planning zone by manually starting each terminal element of a single warning and notification system or, if necessary, using all available resources in place, supplemented by patrols of the Police of the Czech Republic and fire protection units with vehicles fitted with warning and radio equipment for the transmission of emergency information. The process of alternative warning of the public in the emergency planning zone is given in the relevant Off-site Emergency Plan.

The system of warning of the public in the emergency planning zone includes broadcasting of emergency information on the Czech Radio and in the Czech Television. The NPP (at the EDU – shift engineer or Administrator, at the ETE – Electro-control room personnel or Administrator) shall request

the territorially competent Regional Operation Information Centre of the Fire Rescue Service to give an instruction to the Czech Television and the Czech Radio to broadcast emergency information. The siren test is performed at noon every first Wednesday of the month in the Czech Republic.

Picture No. 3: Schematic representation of the public warning system within the emergency planning zone

(Solid lines indicate the basic warning system and dashed lines indicate the backup system.)



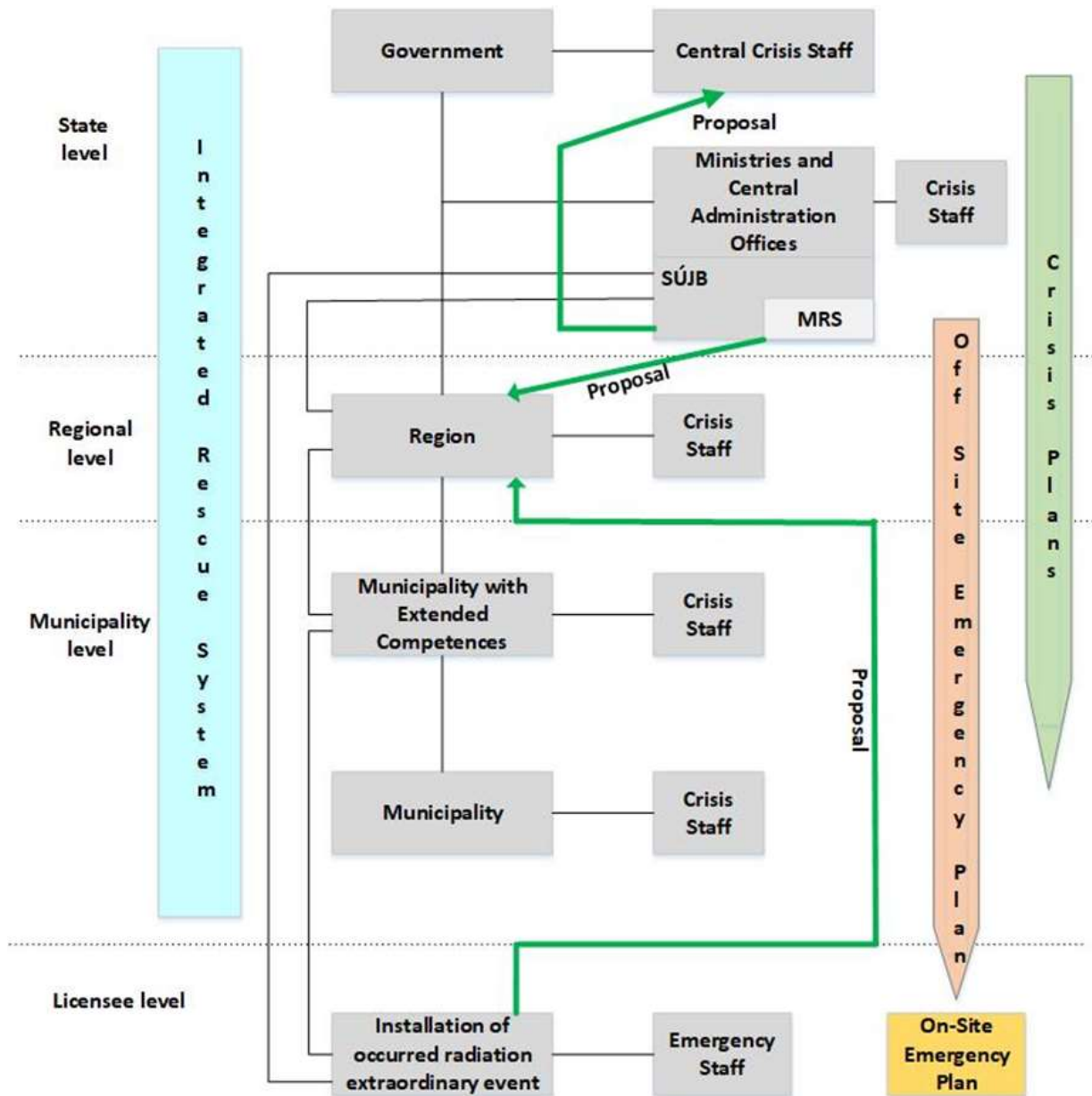
#### 6.1.4.7 Warning and Information in the Case of the Occurrence of a Radiation Accident

In the case of the occurrence of a radiation accident, warning the population is the primary measure. The population is primarily warned through the “General Alert” warning signal. The signal is sounded by a warble tone siren during 140 seconds and can sound three consecutive times at approximately three-minute intervals. The signal is activated by the Fire Rescue Service of the Czech Republic on request of the shift engineer of the operator of a nuclear installation. The signal is immediately followed by spoken emergency information notifying the population of the data on the imminent or occurred extraordinary event and of the measures for protection of population. The provision of such emergency information is performed through the end warning elements, fitted with the module for transmission of voice information. The warning signal indicates a general danger. Other specific information on danger and protection mode will be communicated to the population immediately via radio (Czech Radio) and television (Czech Television), local radio, vehicles of the components of the Integrated Rescue System, or other available method.

In case of a radiation accident occurrence in the Czech Republic or abroad with a possible impact on the Czech Republic territory, the occurring crisis situation is being solved within the crisis (emergency) response system, the basic diagram of which is given on Picture No. 4 below.

Picture No. 4: Basic diagram of the Czech Republic crisis response structure

for the case of a radiation accident



#### 6.1.4.8 Prompt Information of the Public and Neighbouring States in Case of Incidents and Accidents

##### 6.1.4.8.1 Information of the public in the emergency planning zone about occurrence and development of a radiation accident

SÚJB, in accordance with Article 209 of the Atomic Act, on the basis of the results of the radiation situation monitoring carried out, issues proposals for urgent protective actions or follow-up protective actions, or to further specify or withdraw the actions, and confirms or further specifies the proposal for the introduction of urgent protective actions issued by license holder. Inputs for issuance, clarification or withdrawal of the proposal shall be drawn up by SÚJB Crisis Staff.

In accordance with Article 9 para 2 of the Crisis Act, the SÚJB establishes a workplace of emergency response and ensures operation of the SÚJB Crisis Staff. Part of the SÚJB Crisis Staff is also the service



of the contact point designed for continuous reception and transmission of information about radiation incidents and accidents.

The SÚJB Crisis Staff is obliged to process the information and reports about the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic outside the emergency planning zone and about the steps and measures to be taken during the various stages of development of the radiation accident.

The SÚJB Crisis Staff also provides information about the adoption of measures to protect the general public in the Czech Republic in the event of a radiation accident arisen in the territory of Member States of the Euratom to the European Commission and other Member States of the Euratom which may be affected by these measures and, in accordance with the Czech Republic's international commitments, provide public access to information thus obtained.

The SÚJB Crisis Staff in cooperation with the Operation and Information Centre of the Ministry of Interior – General Directorate of Fire Rescue Service of the Czech Republic ensures:

- notification of the IAEA within the meaning of the "Convention on Early Notification of a Nuclear Accident" and the "Convention on Assistance in the Case of a Nuclear and Radiation Accident" and contact points of the countries based on the closed international bilateral agreements, when continuous operation of the contact point for information transmission is ensured by the Operations and Information Centre of the Ministry of Interior – General Directorate of Fire Rescue Service of the Czech Republic,
- notification of the EU within the meaning of the Council Decision No. 87/600/Euratom,
- providing the public with information.

#### 6.1.4.8.2 Arrangements to inform competent authorities in neighbouring States

The Czech Republic is a signatory of the Convention on Early Notification of a Nuclear Accident (the "Early Notification Convention") and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the "Assistance Convention"). With respect to these Conventions, the SÚJB, in relation to IAEA, acts as the National Competent Authority for an Emergency Abroad /a Domestic Emergency. The function of the National Warning Point is ensured by the Operation Information Centre of the Ministry of the Interior of General Directorate of Fire Rescue Service of the Czech Republic. SÚJB acts as the National Competent Authority for an Emergency Abroad and National Competent Authority for a Domestic Emergency also towards the neighbouring countries.

Towards the EU, SÚJB acts as the "Competent Authority" and the Ministry of the Interior – General Directorate of Fire Rescue Service of the Czech Republic acts as the "Contact Point". Information about radiation extraordinary events that may have transboundary impact is provided towards the EU countries, neighbouring States and the IAEA through the USIE systems, webECURIE or via direct contact with the Contracting Party to the bilateral agreement.

Following the "Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency", the Czech Republic is a participant in the RANET network, as from 15 April 2009.

In addition the Czech Republic had concluded bilateral agreements to provide information in case of radiation accident and to ensure the consistency of the measures taken in border areas with all neighboring countries, as well as bilateral and multilateral negotiations with these countries:

- Slovakia (Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Cooperation in the Area of State Supervision of Nuclear Safety of Nuclear Facilities and State Supervision of Nuclear Materials and Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Early Notification of a Nuclear Accident),

- Poland (Agreement between the Government of the Czech Republic and the Government of the Republic of Poland on Early Notification of a Nuclear Accident and Exchange of Information on the Peaceful Uses of Nuclear Energy, Nuclear Safety and Radiation Protection),
- Germany (Agreement between the Government of the Czech and Slovak Federal Republic and the Government of the Federal Republic of Germany on the regulation of issues of common interest relating to nuclear safety and radiation protection), regular annual consultation meetings are held with Germany,
- Austria (Agreement between the Government of the Czech Republic and the Government of the Republic of Austria on issues of common interest concerning nuclear safety and radiation protection and the Protocol between the Government of the Czech Republic and the Government of the Republic of Austria amending the Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Republic of Austria on issues of common interest relating to nuclear safety and radiation protection), regular annual consultation meetings are also held with Austria,
- Hungary (Agreement between the Government of the Czech and Slovak Federal Republic and the Government of the Republic of Hungary on the Exchange of Information and Cooperation in the Field of Nuclear Safety and Radiation Protection).

## 6.2 Restrictions on the Right to Information in Providing Information

*Act No. 106/1999 Coll., on Free Access to Information*

As per Act No. 106/1999 Coll. the duty to provide information shall not apply to requests regarding opinions, future decisions and the creation of new information. It also does not apply to providing information subject to industrial ownership and other information as long as a special law regulates providing of such information, particularly disposing of requests including their elements and the way of submitting the requests, deadlines, remedial measures and the way of providing the information.

All legally bound persons, including the SÚJB and licensees, may also restrict the provision of information if:

- the information relates exclusively to the internal instructions and personnel by-laws, or
- it is new information, which came into being during the preparation of the decision by the SÚJB unless it is otherwise requested by law; this applies until the preparation ends with a decision,
- it is an information which originated without using the public funds, and has been handed over by an individual who the law does not impose such duty on unless he/she has stated he/she agrees with providing the information,
- the protection of third persons toward the subject-matter of the Act No. 121/2000 Coll., on Copyright and rights related to copyright,
- represents a trade secret (Act No. 89/2012 Coll., Civil Code),
- it is described as classified information in accordance with the legal regulation (Act No. 412/2005 Coll., on the protection of classified information and on security qualification),
- the ongoing criminal proceedings,
- the courts' decision-making activity with the exception of the final judgment,
- the performance of duty of the intelligence service (Act No. 153/1994 Coll., on Intelligence Service),
- the preparation, course and the discussion on the results of the inspection in the Supreme Audit Office' s bodies,

- the activity of the relevant organizational unit of the Ministry of Finance under a special legal regulation (Act No. 61/1996 Coll., on Some Measures Against the Legalization of Proceeds of Crime and on Amendments to Related Laws)
- it is information on property owned by an individual who is not a legally bound person, acquired by virtue of laws on taxes, fees, pension scheme, health and social insurance.
- it is information that the SÚJB has acquired from a third person when performing the tasks as part of the control, supervisory, inspecting or similar activities under a special regulation according to which the pledge of confidentiality or a different procedure protecting the information from disclosure or misuse applies.

The legally bound person shall carry out all the restrictions of the right to information so that it shall disclose the information requested including the accompanying information after having excluded the information specified by law. The right to deny the information shall continue only as long as the reason for denial persists. In justified cases, the legally bound person verifies whether the reason for denial persists.

### **6.3 SÚJB`s cooperation with other Member States` regulators**

Legally, the SÚJB ensures international cooperation within the field of its competence, provide information from the field of its competence to the International Atomic Energy Agency, the Euratom and other authorities of the Euratom and ensure implementation of other obligations arising from Euratom legislation relating to, in particular, the national and international evaluation of the exercise of State Authority over nuclear safety of nuclear installations and management of nuclear materials and high-activity sources, as stipulates Article 208 letter k) of the Atomic Act. This provision covers even multilateral and bilateral cooperation with regulators from other EU countries, as described above.

SÚJB has been engaged in international cooperation with other Member States` nuclear regulatory authorities for decades. In this sense, bilateral agreements on nuclear regulatory cooperation have been signed with all neighbor countries. Under these agreements, regular bilateral meetings between the regulatory authorities take place at least once a year and regulatory specialists meet several times a year in working groups dealing with a variety of specific technical and safety topics and issues. In addition SÚJB is an active member of several EC, WENRA, OECD and IAEA working platforms, where SÚJB`s experts and specialists meet frequently their partners from other Member States.

This international cooperation has been focused on exchange of information and on finding solutions and answers to important questions related to safety of nuclear installations including for instance post Fukushima safety measures, safety reference levels, safety objectives for new reactors, etc. It has been very fruitful and effective and it contributed to sharing of safety relevant information and to improving and strengthening Czech nuclear regulatory framework.

### **6.4 Opportunities for the general public to participate in decision making**

The participation of the general public in the decision-making process related to nuclear installations is assured in accordance with relevant national legislation and international instruments. The participation of the general public respects all relevant procedures and their context and enables preservation of the public rights in all stages of the lifecycle of the installations. The Act No. 100/2001 Coll. provides the general public with right to be heard in the environmental impact assessment with

relation to future siting, construction and operation of nuclear installation. The general public may express its views and intentions and raise objections. These inputs, which can deal even with nuclear safety issues must be taken into account by the Ministry of Environment in the final statement to EIA. Moreover, representatives of the general public, who submitted such objections, are entitled to directly participate in following administrative procedures.

Among these following administrative procedures belong procedures in accordance with the Act No. 183/2006 Coll., dealing with siting and construction (building) of nuclear installation. Even though these procedures reflect especially constructing technical aspects of nuclear installations and are conducted parallelly with licensing procedures based on the Atomic Act, both regulatory regimes are interconnected and result in licenses and administrative decisions are requested for performance of the activities in the area of peaceful utilization of nuclear energy. The SÚJB, in accordance with Article 208 letter q) of the Atomic Act, is obliged to issue binding statement (opinions) in proceedings and other actions relating to nuclear installations under the building act (Act No. 183/2006 Coll.). Such binding statement must be taken into account by administrative bodies who are deciding on siting and construction of a nuclear installation according to the Act No. 183/2006 Coll. and by this statement the SÚJB sets binding requirements related to nuclear safety and radiation protection. These conditions must be identical to those included in the SÚJB's licenses to site, construct and operate the same nuclear installation.

Since the general public representatives, who participated in the EIA procedure, may participate in the procedures under the Act No. 183/2006 Coll., they have a right to raise objections against the binding statement of the SÚJB and thus effectively affect nuclear safety and radiation protection aspects.

Under a special circumstances even the processes governed by the SÚJB and aiming to issuance of the license under the Atomic Act may be considered as following administrative procedures as stipulated by the Act No. 100/2001 Coll. In such situation the representatives of the general public, who submitted objections in the EIA procedure, are entitled to directly participate in procedures regulated by the Atomic Act.

## **7 Article 8a: Nuclear safety objective for nuclear installations**

Paragraph 1 – Accident prevention and consequences mitigation

### **7.1.1 Legal requirements for accident prevention and consequences mitigation**

Nuclear safety – i.e. the state and capability of nuclear installations and natural persons operating the installation to prevent uncontrolled self-sustaining fission chain reaction or release of radioactive substances or ionizing radiation into the environment and to mitigate the consequences of accidents – shall be ensured as a matter of priority by anyone who uses nuclear energy (the Atomic Act, Article 4 para 2 letter a) and Article 5 para 2 letter a)). Anyone who uses nuclear energy is obliged, according to the Article 5 para 1 letter a) of the Atomic Act, to prevent radiation extraordinary events and, if they occur, ensure that radiation extraordinary event management procedures are followed and minimize their consequences, Safety, including nuclear safety and radiation extraordinary event management, of a nuclear installation shall be ensured throughout its life cycle by means of defence-in-depth (the Atomic Act, Article 45 para 1).

A nuclear installation is subject to these requirements already during the design phase. The Atomic Act stipulates that it shall be designed in a manner ensuring its safety, including nuclear safety and radiation extraordinary event management, throughout its life cycle (the Atomic Act, Article 46 para 1). A nuclear installation design shall ensure, inter alia, compliance with safety objectives, principles of

the safe use of nuclear energy and with the requirements for the application of defence-in-depth (the Atomic Act, Article 46 para 2).

General obligations of a license holder (for an activity related to the use of nuclear energy) is to ensure that the nuclear installation, from the commencement of construction to decommissioning, meets the safety objectives, safety functions and principles of the safe use of nuclear energy, reflects the site characteristics of the site for a nuclear installation and meets the nuclear installation design requirements (the Atomic Act, Article 49 para 1 letter b)). Holders of a license for an activity related to the use of nuclear energy are obliged to introduce processes and activities, the purpose of which is to prevent accident conditions at a nuclear installation from escalating and mitigate their consequences, document them and continuously update them (the Atomic Act, Article 49 para 1 letter u)).

Accident conditions are states of a nuclear installation, which are not an operational states. Those include (pursuant to the Article 2 of the Decree No. 329/2017 Coll.): design basis accident (accident conditions in the event of which the correct functioning of safety systems ensures that the corresponding exposure reference levels or limits are not exceeded), design extension conditions (accident conditions triggered by scenarios more serious than design basis accident, which are taken into account in nuclear installation design) and severe accident (accident conditions involving serious damage of nuclear fuel either due to serious damage to and irreversible loss of the structure of the core of the nuclear reactor or the system for nuclear fuel storing due to damage to fuel assemblies as a result of nuclear fuel melt). Article 48 para 5 of the Atomic Act stipulates that safety assessment shall verify the implementation of measures to prevent the emergence of accident conditions and to mitigate their consequences, including defence-in-depth.

### **7.1.2 Legal requirements pertaining to the nuclear safety objective for nuclear installation (avoiding the early and large radioactive releases)**

Nuclear installations shall be designed in a manner ensuring their safety, including nuclear safety and radiation extraordinary event management, throughout their life cycle. The nuclear installation design shall ensure, inter alia, compliance with safety objectives and with the principles of the safe use of nuclear energy (the Atomic Act, Article 46 para 2).

The Decree No. 329/2017 Coll. describes the safety objectives for a nuclear installation design. Nuclear installation design shall, inter alia, prevent accident conditions and mitigate the consequences of accident conditions, if they occur, and ensure that a radiation accident where there is not sufficient time to implement urgent action to protect the population (referred to as "early radiation accident") and a radiation accident requiring urgent action to protect the population that cannot be limited in terms of location or time (referred to as "large radiation accident") are practically excluded events (Decree No. 329/2017 Coll., Article 4 para 1 letter c)). That means their occurrence is considered physically impossible or is, with a high degree of confidence, highly improbable (Decree No. 329/2017 Coll., Article 2 letter a)). Safety assessment shall verify the implementation of measures to prevent the emergence of accident conditions and to mitigate their consequences, including defence-in-depth (Atomic Act, Article 48 para 5).

In order to manage design extension conditions, the design of nuclear installations with a nuclear reactor shall ensure reasonably practicable technical and organizational measures to achieve such resistance of the nuclear installation that a severe accident, which could lead to an early radiation accident or a large radiation accident, is a practically eliminated matter. Severe accident that does not fall within the scope of practically eliminated events and which could lead to a radiation accident shall be managed in such a manner that no protective measures stricter than urgent protective actions (sheltering iodine prophylaxis and evacuation) or restriction of the use of radionuclide-contaminated food, water and feedingstuffs are necessary (Decree No. 329/2017 Coll., Article 7 para 5).

Nuclear installation design shall set out and evaluate reasonably practicable measures for managing a postulated severe accident corresponding to the type of the nuclear installation so that the damaged and melting core and the stored nuclear fuel or nuclear material being handled are cooled and the melt from the damaged and melting core is contained, the development of the subsequent fission chain reaction is prevented and the safety objectives of the design are complied with (Decree No. 329/2017 Coll., Article 7 para 6).

Paragraph 2 – Application of the nuclear safety objective

### **Legal requirements on application of the nuclear safety objective**

The Atomic Act has entered into force on 1 January 2017 (Atomic Act, Article 239). All legal requirements are applicable both to nuclear installation under construction as well as existing nuclear installations. Same legal requirements are applicable, as the Czech nuclear law makes no distinctions between the requirements for nuclear installations for which a construction license has been granted for the first time after 14 August 2014 and existing nuclear installations.

According to the Decree No. 329/2017 Coll. any nuclear installation design shall, inter alia, prevent accident conditions and mitigate the consequences of accident conditions, if they occur, and ensure that an early radiation accident and a large radiation accident are practically excluded events (Decree No. 329/2017 Coll., Article 4 para 1 letter c)). That means their occurrence is considered physically impossible or is, with a high degree of confidence, highly improbable (Decree No. 329/2017 Coll., Article 2 letter a)).

The as-built documentation of the nuclear installation shall correspond to its actual state throughout the life cycle. The evaluation of compliance of the design with these requirements shall be documented. (Atomic Act, Article 46 para 7). Safety objectives of a nuclear installation design are, as explained above, covered by the Decree No. 329/2017 Coll.

As a reasonably practicable shall be taken to mean reaching of compliance with a particular requirement set out in the Decree No. 329/2017 Coll. when the risk of a radiation accident due to insufficient capability of the nuclear installation to meet the set safety objectives is reduced, while the reasons and conditions for using of the nuclear installation do not change significantly (Decree No. 329/2017 Coll., Article 6 para 6).

National legal provisions concerning the safety assessment, including periodic safety assessment (review), are laid down in Article 48 of the Atomic Act. The level of safety, including nuclear safety and radiation extraordinary event management, shall be regularly, systematically, comprehensively and verifiably assessed and documented during whole life cycle of a nuclear installation. Safety assessment shall be used to evaluate relevant information about the risks associated with the use of nuclear energy and to adopt measures to prevent compromising the level of safety, including nuclear safety and radiation extraordinary event management. Safety assessment shall verify the implementation of measures to prevent the emergence of accident conditions and to mitigate their consequences, including defence-in-depth.

Nuclear safety assessment, including the periodic safety review, is governed by the Decree No. 162/2017 Coll. Periodic safety review shall be performed at preestablished regular intervals to review in a systematic and comprehensive way various areas, including the nuclear installation design (Decree No. 162/2017 Coll., Article 13 para 2). Periodic safety review shall compare achieved (current) state of safety, including nuclear safety and radiation extraordinary event management, of a nuclear installation with the legal requirements and requirements stemming from the present level of science and technology and good practice that are applicable at the time of the assessment (Decree No. 162/2017 Coll., Article 13 para 1). All areas relevant for safety of a particular type of nuclear

installation, including nuclear safety and radiation extraordinary event management, must be integrated in the periodic safety review both for separate operating units and as well as for nuclear installation as a whole (Decree No. 162/2017 Coll., Article 16 para 1). The safety relevance of all identified deficiencies (in the terms of safety requirements) must be evaluated. Based on the identified deficiencies a proposal for a set of measures designed to ensure adequate level of safety, including nuclear safety and extraordinary event management, until further assessment is performed together with a timeframe for their deployment. (Decree No. 162/2017 Coll., Article 14) Periodic safety reviews shall be used, inter alia, to assess a real project solution of system, structures and components and their functioning in comparison with applicable safety requirements. Such assessment includes among others a method of documenting modifications that have occurred on the nuclear installation and capability of nuclear installation to fulfil the principles of the safe use of nuclear energy (Decree No. 162/2017 Coll., Article 17 letter a)).

## **8 Article 8b: Implementation of the nuclear safety objective for nuclear installations**

### **Paragraph 1 – Defence-in-depth**

#### **Legal framework for defence-in-depth concept application**

In the Atomic Act the defence-in-depth is defined as a method of protection based on multiple independent levels providing a graded protection against the possibility of exposure of workers and the general public, propagation of ionizing radiation and release of radioactive substances into the environment. Safety, including nuclear safety, and radiation extraordinary event management shall be ensured throughout the life cycle of a nuclear installation by means of defence-in-depth (Atomic Act, Article 45 para 1). Together with other safety aspect a nuclear installation design shall ensure compliance with the requirements for the application of defence-in-depth. As mentioned above, the safety assessment shall verify the implementation of measures to prevent the emergence of accident conditions and to mitigate their consequences, including defence-in-depth. The method of ensuring the defence-in-depth is laid down by the Decree No. 329/2017 Coll.

Nuclear installation design shall, inter alia, in the context of ensuring compliance with requirements for the application of defence-in-depth, set out requirements for the nuclear installation ensuring the application of defence-in-depth for all activities relevant to utilization of nuclear energy, the creation of a series of successive physical safety barriers that are placed between radioactive materials and the surrounding area of the nuclear installation and prevention of the occurrence of a radiation extraordinary event using these physical safety barriers (Decree No. 329/2017 Coll., Article 6 para 1). Nuclear installation design shall, in the context of ensuring compliance with requirements for the application of defence-in-depth, set out technical and organizational measures for managing abnormal operation, design basis accidents and design extension conditions, including severe accident (Decree No. 329/2017 Coll., Article 6 para 5).

In order to manage design extension conditions, the design of nuclear installations with a nuclear reactor shall ensure reasonably practicable technical and organizational measures to achieve such resistance of the nuclear installation that a severe accident, which could lead to an early radiation accident or a large radiation accident, is a practically eliminated matter (Decree No. 329/2017 Coll., Article 7 para 5).

The fundamental design basis shall specify the external fundamental design basis events for the location for siting the nuclear installation. These external fundamental design basis events shall be the limit value for the loads on systems, structures and components of the nuclear installation imposed by the location characteristics and the combinations thereof, at which the safety objectives of the nuclear installation design can be expected to be fulfilled with high degree of confidence (Decree No. 329/2017 Coll., Article 11 para 1). Severe accident that does not fall within the scope of practically eliminated events which could lead to a radiation accident shall be managed in such a manner that no protective measures stricter than urgent protective actions (sheltering iodine prophylaxis and evacuation) or restriction of the use of radionuclide-contaminated food, water and feedingstuffs are necessary. Nuclear installation design shall set out and evaluate reasonably practicable measures for managing a postulated severe accident corresponding to the type of the nuclear installation so that the damaged and melting core and the stored nuclear fuel or nuclear material being handled are cooled and the melt from the damaged and melting core is contained, the development of the subsequent fission chain reaction is prevented and the safety objectives of the design are complied with. (Decree No. 329/2017 Coll., Article 7 para 5 and 6).

Radiation extraordinary event management, including response preparedness, is address in the Title VIII of the Atomic Act. For further details see the following chapter of this report. Detailed requirements for the processes and activities to prevent the development of accident conditions in a nuclear installation and to mitigate their consequences, including organizational measures for accident conditions management, can be found in the Decree No. 21/2017 Coll. Person obliged to introduce the management system (including license holders for performing activities related to the use of nuclear energy) shall introduce the management system shall determine the organizational structure and interactions between organizational units, personnel and other persons. Within this management system, the management method and the individual management levels must be stipulated within the scope of the organizational structure (Decree No. 408/2016 Coll., Article 3 para 5 letter f)). For further details see the relevant section of this report describing the management system requirements.

## **Paragraph 2 – Safety culture**

### **a - Legal framework for safety culture**

Basic legal provision of the Atomic Act is that anyone who uses nuclear energy shall as a matter of priority, ensure nuclear safety, safety of nuclear items and radiation protection, while respecting the present level of science and technology and good practice. Person obliged to introduce the management system (including license holders for performing activities related to the use of nuclear energy) shall introduce the management system in a manner ensuring that through this system the safety culture is permanently developed and regularly evaluated. Safety culture includes characteristics and attitudes of persons performing activities related to the use of nuclear energy and activities in exposure situations and of their personnel, which ensure that safety, including nuclear safety and radiation extraordinary event management, are approached with a seriousness corresponding to their importance (the Atomic Act, Article 30 para 7).

The method of ensuring appropriate qualification of the personnel and the scope and method of ensuring the permanent development and regular evaluation of safety culture are laid down by the implementing legislation – Decree No. 408/2016 Coll. The ability to manage employees to ensure and increase safety, including nuclear safety and radiation extraordinary event management, must be developed and maintained at all levels of management so that it can be effectively applied in achieving the objectives of the management system and developing and evaluating safety culture (Decree No. 408/2016 Coll., Article 3 para 5 letter g) and h)). Safety culture in the management system of the subject implementing the management system shall be continuously developed with managers constantly contributing to the improvement and development of the safety culture.

### **b - SÚJB approach and activities**



Measures to improve safety culture are the full responsibility of the license holder. The SÚJB approaches to this part of the implementation of the Safety Culture Development Programme through a regulatory approach based on three pillars recommended by the IAEA and described, for example, in IAEA-TECDOC-1707. These pillars are as follows:

1. Common understanding of safety culture. The nature of safety culture is different from the application of legal regulations to technology. Understanding these differences and uniqueness is critical to achieving a common language and method of communication between the licensee and the regulatory body. This common understanding then becomes a peculiar instrument for promoting the importance of safety culture in ensuring nuclear safety.
2. Dialogue. To better understand the safety culture, it is necessary to share information in an open dialogue and share ideas and knowledge, which are often qualitative in nature. Dialogue on mutual roles of both parties promotes creative and constructive way of finding solutions for continuous improvement of safety.
3. Continuity. Developing a healthy safety culture requires sustained commitment and involvement of the licensee. Oversight of the regulatory body of safety culture responds to internal processes of the licensee, while affecting them as one of the independent inputs of information.

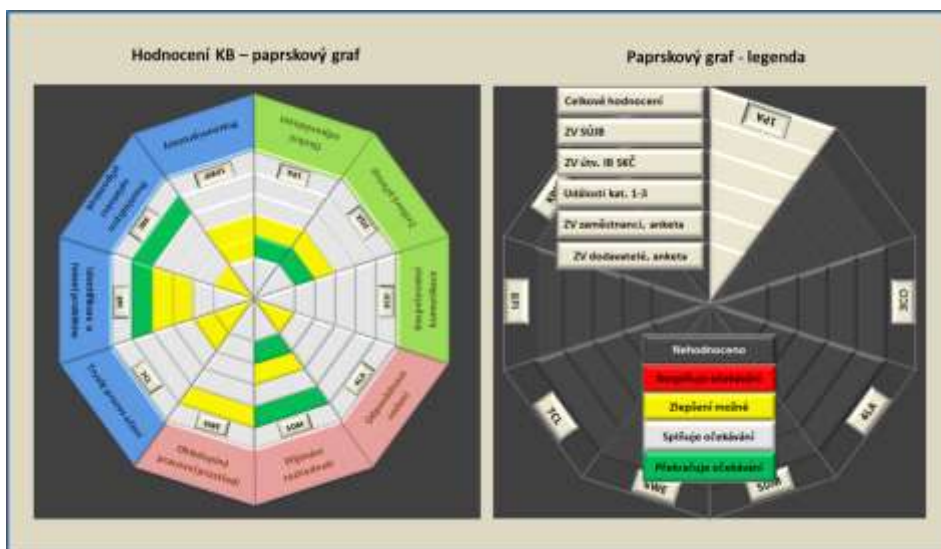
SÚJB performs its own assessment of nuclear safety level at nuclear installations. U.S. NRC 10 traits characteristic are adopted for trending. Results of SÚJB nuclear safety level assessment are regularly sent to licensees and are also discussed at regular meetings between the SÚJB and licensees at various working levels, including top management level meetings.

#### c - Description of safety culture assessment in ČEZ, a. s.

The assessment of safety culture takes place in an annual period (January to February following the year for which the assessment is made - the previous year), and the results and the measures taken are documented in the form of a summary document “Analysis of the Safety Culture in ČEZ, a. s., for the Previous Year”.

The assessment result is shown by means of a radial decagon graph where each sector represents one characteristic of safety culture.

Figure 1: Radial graph - assessment of the safety culture of Nuclear Energy Division in 2018



The individual layers in sectors of the radial graph show the outputs of specific assessment methods (in order from the center of the graph):

- Questionnaire survey among employees of contractors.

- Questionnaire survey among employees of ČEZ, a. s.
- Assessment of major events.
- Internal assessment of independent nuclear oversight of ČEZ, a. s.
- External independent assessment of the SÚJB.
- Cumulative assessment for each characteristic of safety culture.

Color highlighting individual segments (point of intersection of a sector and a layer) characterizes the result of assessment using a particular method for that characteristic.

The overall assessment of safety culture for each characteristic of safety culture is the arithmetic mean of all the assessment methods used and is shown in the sixth (last) layer of the radial graph with the code identification of the characteristic.

The assessment of safety culture includes both employees of the licensee carrying out activities linked to the nuclear safety and its direct contractors, and includes:

1. Assessment of safety culture indicators - qualitative and quantitative assessment.
2. Assessment of the contribution of safety culture to the most important events, the corrective measures imposed in this area and their effectiveness.
3. Assessment of the overall effectiveness of the safety culture program and planned activities in this area.

The assessment of the safety culture among employees of the licensee is carried out at three levels (central departments, Dukovany NPP and Temelín NPP).

#### Development of safety culture

The development (improvement) of the safety culture within the company ČEZ, a. s., requires a systematic, long-term work, consistency and perseverance. Leaders play a very important role in the development of safety culture. The monitoring of changes and trends in the attitudes of employees and contractors is carried out using a questionnaire survey index. The basis for developing a safety culture within the company ČEZ, a. s., are the Plans for Safety Culture Development that determine systemic measures in response to the outcomes of the assessment of safety culture for the previous period.

Ensuring of the clarity of characteristics and attributes of a healthy safety culture for employees and contractors takes place in various forms of training in the area of safety culture. At the meetings, the "Safety Notes" are used to develop a safety culture, which point to a specific problem or exemplary practice linked to a particular attribute of safety culture.

Leaders at all levels of management consistently provide feedback on positive behaviour from the perspective of safety culture under the Observation Program. At the same time, they increase employee and contractor motivation by compliments or using other incentive-based instruments. Single and multiple information and visualization campaigns are carried out through communication.

### **d - Operating experience and reporting of events**

Holders of a license for an activity related to the use of nuclear energy is, according to the Article 49 para 1 letter j) of the Atomic Act, obliged to perform an investigation of an operational occurrence, notify an operational occurrence to the SÚJB and take measures to prevent an operational occurrence and to remedy the state after an operational occurrence. According to the Atomic Act operational occurrence means any occurrence at a nuclear installation in the course of the nuclear installation's life cycle that has actual or potential consequences for safety, including nuclear safety and radiation extraordinary event management. Detailed requirements concerning operational events are laid down by the Decree on Assuring Nuclear Safety of a Nuclear Installation (time limits for notification of an

operational event to the SÚJB, investigation procedure for an operational event, range of information used by the feedback system, criteria for categorisation of an operational event etc.).

**e - Example: Description of operational experience feedback activities.**

Nuclear power plants operated by ČEZ, a. s. apply a system permitting to benefit from their own operating experience – Dukovany NPP since the beginning of its commercial operation in 1985, and Temelín NPP in the course of its constructions and commissioning. At the same time both NPPs make benefit of experiences from international nuclear power plants, obtained from the IRS (Incident Reporting System), WANO networks, JRC Clearinghouse, from operators in the Slovak Republic and also from relevant non-nuclear industry. The whole process, which includes examination of the operational event and non-conformity causes, adoption of remedial measures and feedback of experience from these events and non-conformities, is ensured by units in the relevant NPP, which report directly to the NPP Director.

In 2018, a new department was established in the central department of ČEZ, a. s., that performs the supervisory activities for the investigation of events. The processes of recording, investigation of events and the use of experience are described in the managing documentation that is common to both NPPs.

The process covers methods for gathering information on operational events and non-conformities including Near Miss, their registration, investigation procedure, and analysis of their causes, categorisation of relevance, establishment and adoption of remedial measures for these events, monitoring of their implementation and evaluation of operational events feedback effectiveness and trends. The process also includes obligation and procedure for the transfer of own experience to other NPP operators and for the dissemination of foreign and own operating experience within the power plant. For events, the investigation includes evaluation of the attributes of safety culture, which subsequently enter into a further assessment of safety culture at the NPP.

The events are evaluated according to the INES international scale for evaluation of event significance in the nuclear installations. A head of the Operational Event group of the relevant NPP is responsible for the complete event-related investigation. Such group coordinates the whole process of events investigation in the power plant, but also other further plant specialists from special units and contractors are involved in the process.

These activities are supporting the effort to consistently investigate all events, which may jeopardize safe and reliable operation. The principle is that open communication setting and the admission of own mistakes is an acceptable impetus to improvement of the safety culture, whilst the priority is not to find the guilty parties, but to improve the condition (“blame-free atmosphere”).

The own procedure for analyzing the causes of operational events is chosen from the set of techniques most commonly used for this purpose, e.g. HPES (WANO methodology), or ASSET (IAEA methodology).

For regular evaluation of effectiveness of experience from own operational events, the main criterion is the event non-recurrence for the same causes. Repeated events or problems are regularly evaluated in ČEZ NPPs and documented in annual reports on the operational events. Possible further measures are proposed. Effectiveness and efficiency evaluation of corrective measures is carried out for all safety relevant events. For tracking problematic areas – trends, precursors – the coding of event causes is used. This is elaborated as a part of annual report “Feedback from internal events”.

All employees including contractors are obliged and encouraged to identify and record all events and non-conformities including Near Miss. Such records are classified by a multifunctional team into five categories, including designation of the department responsible for settlement.

- Category 1 – Significant event, non-conformity with a high uncertainty as to the correctness of settlement and a high risk of impacts severity and recurrence probability. It is necessary to analyze the causes until the “Root Causes” of the non-conformity/event have been identified and for the

investigation of which, analysis, definition of remedial measures and assignment of responsibilities for the implementation of the remedy imposed, a special, multi-disciplinary team is established, usually composed of managers of special units and led by the director of NPP. These events/non-conformities are discussed by the Correction and Prevention Commission of the relevant NPP and the causes together with the adopted corrective measures are regularly checked out by the SÚJB.

- Category 2 – Significant event, non-conformity with a high uncertainty as to the correctness of settlement and a medium risk of impacts severity and recurrence probability, or with a medium uncertainty as to the correctness of settlement and a high risk of impacts severity and recurrence probability. It is necessary to analyze the causes of the non-conformity/event and the investigation of which, analysis, settlement as well as the implementation of the remedy imposed require cooperation of several units. These events/non-conformities are discussed by the Correction and Prevention Commission of the relevant NPP and the causes together with the adopted corrective measures are regularly checked out by the SÚJB.
- Category 3 – Less significant event/non-conformity with an uncertainty as to the correctness of settlement and a medium risk of impacts severity and recurrence probability, which are not under Category 1 or 2. There is a need to analyze the apparent causes of the non-conformity/event, and identify and implement corrective measures. For this category, it is assumed that the competence and capacity of the unit to which it was assigned are sufficient for the analysis, definition of the remedial measures and implementation of the associated activities. These events/non-conformities are investigated within the work order of the corresponding units; these events are not discussed by the Correction and Prevention Commission but the results of the investigation are communicated to the Commission; corrective measures are checked by the Correction and Prevention Commission of the relevant NPP.
- Category 4 – Low-level events (LLE), non-conformities with a high uncertainty as to the correctness of settlement and no risk, medium uncertainty and low risk, low uncertainty and medium risk of impacts severity and recurrence probability. Their possible influence on any process in the plant is being evaluated. Trend monitoring according to common causes is carried out and negative precursors are evaluated. Regular evaluation is submitted to the power plant management.

The last category is intended for the monitoring of proposals for improvement and the introduction of best practices.

- Category 5 – proposal for improvement – a condition that does not eliminate unwanted deviation from the mandatory requirement, but a way has been proposed to improve or refine this condition or achieve greater effectiveness/efficiency.

Recorded non-conformities are settled in a single system in an expert commission. The commission meets once a week. This commission, which is set up as an advisory board for NPP Director, evaluates trends and precursors of the non-conformities for which corrective measures are proposed and adopted, at its quarter meetings. In case of recurrence and, where relevant, on request of the management, system is set for the escalations of events/non-conformities to higher category.

The Events Investigation Commission (Correction and Prevention Commission) is established as the advisory team of the executive director of NPP for identification of causes, corrective measures and conclusions for the events investigation in individual power plants, confirms at its regular meetings the completeness of the investigations of safety related event causes and adopts corrective measures for the elimination of their causes for the purpose of prevention of their repeating.

Significant events that can be used by other operators are transferred into the WANO network.

The events of nuclear power plants are shared within ČEZ, a. s., through the Failure Committee, Conventional Energy Division, which receives information about the events in the inactive part of the nuclear power plant and at the same time, takes over information about the events at conventional

power plants applicable to nuclear power plants. Lessons learned from the events are thus shared across the company.

The power plant personnel are informed on selected events both from internal and from external feedback.

All commissions are an element of the safety assessment of persons responsible for safety, and their activity and results are subject to independent supervision and evaluation by special units that are not responsible for operating results.

Regulatory authority, the SÚJB, regularly supervises this process, and in some cases of important events, inspects the progress of examination and assessment of sufficiency of remedial measures taken in the course of event management.

Both NPPs are actively involved in the system that enables sharing of event information (WER) within the framework of WANO - the international organization of nuclear power plant operators. This allows active and effective mutual cooperation with other NPP operators in operating experience exchange. Within the system of the use external experience, other sources are also used, e.g. IRS (IAEA), JRC Clearinghouse (European Commission). Analysis and utilization of operating experience and technical information from other operated nuclear power plants conduce to improvement of the NPP operation safety and reliability. When sharing own operating experience within the framework of WANO, ČEZ, a. s., NPPs conduce to effective application of this process within the international context.

The above mentioned system of taking profit from the events in other nuclear installations on worldwide basis (WANO) is incorporated into the event investigation process. The main objective is to transfer and to utilize any operating experience and technical information acquired by nuclear power plant operators in the ČEZ, a. s., NPPs practice.

SÚJB carries out regular inspections in the field of the use of operating experience. These include

- internal feedback inspections,
- external feedback inspections.

Internal feedback inspections take place according to the internal regulations of the SÚJB quarterly on each site. The inspection reviews the investigation of operational events by the license holder and includes usually all significant operational events. At the discretion of the inspection team, the inspection may include the review of the investigation of less significant operational events. The inspection covers the own investigation of the event by the license holder, identification of direct and root causes, impact assessment of human factor on the operational event, impact assessment of safety culture and the definition of adequate remedial measures.

For external feedback inspections, which take place once a year in accordance to the internal regulations of the SÚJB, the inspection team chooses especially the events published in the IRS system, evaluates these events for relevance to the nuclear installations operated in the Czech Republic, and includes these subsequently in the inspection.

The inspection reviews the way in which the license holder manages external events. Whether and why they were determined to be relevant or irrelevant to its nuclear installation, and what lessons the license holder learned from the analysis of events, what remedial measures were implemented in response to external events at its nuclear installation. Regulatory programs for operating experience feedback and sharing of important experience with international organizations and other regulatory bodies.

The SÚJB regularly publishes the most interesting events through the IAEA/IRS system. The events are presented at the IRS/INES working groups. In preparation of the report on the event for IRS, it consults the final report for the IRS with the JRC.

## **f - Education and training**

Qualification requirements for activities relevant to nuclear safety shall be determined by each holder of a license for an activity related to the use of nuclear energy. Licensee shall also determine the qualification requirements for activities relevant to nuclear safety and provide for a system of education, training and practice for the personnel and provide for a system of education on radiation extraordinary event management for the natural persons concerned with the intervention instructions, the on-site emergency plan or emergency regulations (the Atomic Act, Article 49 para 1 letter n) and 156 para 1 letter e)).

Decree No. 408/2016 Coll. requires appropriate qualifications of personnel are ensured.

Decree No. 409/2016 Coll. sets out, in compliance with the provisions of the Atomic Act, activities specifically important to nuclear safety and radiation protection, requirements for qualification and professional training, method of verification of special professional competence and authorization process of the selected staff. Annexes to Decree No. 409/2016 Coll. set out the list of theoretical and practical fields of knowledge that is contained in the education and training required for the performance of inspection activities falling within the authority of the SÚJB.

## **9 Article 8c: Initial assessment and periodic safety reviews**

LETTER A) – Initial assessments

### **Legal requirements**

General obligation to conduct safety assessment is embedded in Article 49 para 1 letter d) of the Atomic Act. More concrete requirements for safety assessment are set out in Article 48 of the Atomic Act and in the Decree No. 162/2017 Coll. These requirements have a close relation to licensing and specifically to legislative provisions ensuring appropriate site and installation assessments are conducted (as required by Article 8c letter a) of the NSD), which are:

- Article 47 of the Atomic Act (Requirements for siting of nuclear installation),
- Decree No. 378/2016 Coll., on Siting of Nuclear Installation,
- Article 46 of the Atomic Act (Requirements for nuclear installation design and the design process of nuclear installation),
- Decree No. 329/2017 Coll., on Design Requirements for Nuclear Installation.

Various types of licenses mentioned in Article 8c letter a) NSD (site licensing, construction license, operation license) are stipulated in Article 9 para 1 of the Atomic Act. A license from the SÚJB is required for the siting of a nuclear installation, the construction of a nuclear installation, the first physical start-up of a nuclear installation with a nuclear reactor, the first power-generation start-up of a nuclear installation with a nuclear reactor, the commissioning of a nuclear installation without a nuclear reactor, the operation of a nuclear installation, the individual phases of decommissioning of a nuclear installation and the carrying out of modifications affecting nuclear safety, technical safety and physical protection of a nuclear installation.

A license is granted if, and only if, the applicant demonstrates fulfilment of all the requirements stipulated for different types of licenses by the Atomic Act and its implementing decrees. An applicant

for a license related to a nuclear energy utilization is obliged to demonstrate compliance with the requirements laid down in the atomic legislation through a documentation, which needs to be submitted together with a license application. (Article 16 para 2 letter d) of the Atomic Act stipulates that the license application shall be, in addition to other evidence of compliance with the conditions laid down by the Atomic Act, accompanied by the required documentation for the activity to be licensed whereas the requested documentation for different types of licenses is listed in Appendix 1 to the Atomic Act and further specified in different legislative acts implementing relevant provisions of the Atomic Act).

The documents listed in the Appendix 1 explicitly include Initial Safety Analysis Report (focused on initial assessment of the site planned for the construction of a specified nuclear installation), Preliminary Safety Analysis Report (focused on initial assessment of the design of the nuclear installation) Pre-operational Safety Analysis (focused on initial assessment of nuclear installation readiness for the first loading of nuclear fuel into the reactor).

The nuclear installation design is the very basis to any nuclear installation development and utilization, the nuclear installation design process shall comprise an evaluation of compliance of the design with the requirements laid down in atomic legislation (Article 46 para 5 of the Atomic Act). The evaluation of compliance of the design with the requirements established in atomic legislation shall be documented (Article 46 para 7 of the Atomic Act). Proper implementation of the design requirements must be regularly and continuously assessed by a license holder through safety assessment. The safety assessment is regulated by Article 48 of the Atomic Act and by Decree No. 162/2017 Coll.

In relation to the requirement for an appropriate site and installation-specific assessment it is necessary to also mention general obligation of holders of a license for any activity related to the use of nuclear energy stated in Article 49 para 1 letter l) and m) of the Atomic Act. Holders of a license shall continuously evaluate the facts relevant to the assessment of the acceptability of the site for a nuclear installation and their effect on nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management, and security, and estimate developments in the facts relevant to the assessment of the acceptability of the site for a nuclear installation with a view to the expected length of the nuclear installation's life cycle.

LETTER B) - Periodic safety reviews

### **Legal requirements**

General obligation to conduct safety assessment is embedded in Article 49 para 1 letter d) of the Atomic Act. More concrete requirements for safety assessment are set out in Article 48 of the Atomic Act and in the Decree No. 162/2017 Coll..

This obligation applies to all holders of a license for an activity related to the use of nuclear energy. Regulatory control of the Office over those license holders is being exercised on the basis of Article 200 of the Atomic Act (Article 200 para 1 of the Atomic Act states that the SÚJB shall conduct inspections of compliance with this Act, regulations issued to implement this Act, commitments arising from international treaties binding on the Czech Republic applicable to the peaceful use of nuclear energy and ionizing radiation, and decisions issued on the basis of this Act, and inspections of the performance of the obligations laid down in the metrology act as regards measuring instruments intended or used for measuring ionizing radiation and radioactive substances. Article 200 para 2 letter a) of the Atomic Act states that the SÚJB shall inspect license holders, registered persons and notifying persons.).

The obligation to "re-assesses systematically and regularly, at least every 10 years, the safety of the nuclear installation" (as provided for in Article 8c letter b) of the NSD) is reflected in Article 48 para 1 and para 2 letter c) of the Atomic Act and in details in Articles 13 to 21 of the Decree No. 162/2017

Coll. Article 15 of Decree No. 162/2017 Coll. prescribes the first periodic safety review to be conducted within 6 years following the commissioning of nuclear installation. The next safety reviews shall be conducted within 10 years following the previous ones. Art. 15 para 3 prescribes special periods for decommissioning of nuclear installations.

### **9.1.1 Examples of measures taken by the license holder**

The Periodic Safety Review, Final Safety Analysis Report and its periodic revisions, and successful implementation of the corrective measures program are considered to be part of the main pieces of evidence that the design and the construction of the nuclear installation provide several reliable protection levels (defence-in-depth) against radioactive material release aimed at preventing accidents and mitigating their possible radiological consequences in compliance with in the IAEA document INSAG-10.

The operation of the Dukovany NPP units has unequivocally proven that the design of this nuclear installation ensures reliable, stable and easily controlled operation. Over the years, the plant underwent a number of modifications done with the objective to minimize the possibility of a human factor error and to improve the man-machine interface, especially in the process control system. Additional modifications are scheduled within the Modernization Program of Dukovany NPP.

For reliable and safe operation with emphasis on human factor and man-machine interface, both the design and the technical tools of the main control rooms are very significant. The main control room renovated within the "I&C system refurbishment project" provides:

- synoptic view of the equipment condition, fast and easy orientation of the main control room personnel during normal operation as well as during transients. The original situation has been improved further by changes in the instruments' ergonomic design implemented as a result of the operators' initiative,
- fast and easy equipment control from the main control room,
- appropriate design of the failure and emergency warning systems which contributes to timely and correct identification of failures. Innovations were implemented with emphasis on improvement of the man-machine interface,
- appropriate combination of analogue (classic) type signaling and control of the main control room with digital elements – computer based equipment which is implemented to the main control room,
- more extensive computerization in the main control room improves the personnel's work efficiency and has a favourable effect on the man-machine interface and thus limits possible errors due to the "human factor". This concerns in particular a series of supporting computer programs performing auxiliary calculations enabling the utilization of documentation.

The Periodic Safety Review, Final (Preoperational) Safety Analysis Report and its periodic revisions, and the implementation of the corrective measures identified by PSR are considered to be one of the main pieces of evidence that the design of a nuclear installation provides for several reliable levels and methods of protection against a release of radioactive materials (defence in depth), also with a goal to prevent the occurrence of accidents and to mitigate their radiological consequences should they occur.

The results of the "EU stress tests" review – targeted evaluation of safety margins and resistance of both NPPs against extreme natural conditions, loss of electric power supply, loss of heat removal into the ultimate heat sink and the ability to manage the situation in case of scenarios leading to a severe accident for most accident scenarios – have confirmed the safety and time margins of these designs, sufficiently robust barriers and design features ensuring defence in-depth levels. These design features are supported by qualified personnel and administrative and technical provision of accident management (the high resistance of both the power plants against extreme effects). No problem/condition was identified at any power plant that would require immediate measures. Both the power plants are able to safely withstand even highly improbable extreme emergency conditions



without endangering the plant surroundings. Results of the stress tests have confirmed the fact that the designs and actual state of both NPPs provide sufficient margins to avoid severe accidents.

In respect to external risks, the strengths of both the power plants include in particular:

- robust and conservative design ready to face demanding conditions;
- design that is continually checked and reviewed against the current safety requirements;
- continual process of incorporation of new safety requirements;
- two large water reservoirs/dams for raw water at both the power plants;
- a robust supply of cooling water inside the power plants;
- compact racks of the spent fuel storage pool ensuring subcriticality of fuel even in case of flooding with pure water;
- at Dukovany NPP, a particularly large volume of hermetic compartments (bubbler condenser system) and relatively smaller source term (lower reactor power parameters) and the possibility of using diverse means for heat removal (fire pumps);
- at Temelín NPP, the spent fuel storage pool located inside the full-pressure containment.

**The electric power supply** sources at Dukovany and Temelín NPPs ensure a sufficiently robust design and level of safety in the event of an external loss of electric power supply. The design benefits from a high level of mutual independence between working and backup sources of on-site power and redundancy of secured power supply systems that supply safety-important systems and components and have their own emergency sources (diesel generators and accumulator batteries). The unit operating on power has a higher design resistance against a loss of electric power supply than during outage for refueling. The least favourable case from the viewpoint of safety assurance is the loss of electric power supply at all/both units at a time.

On both plants, another alternative method of long-term charging of accumulator batteries and other necessary systems is planned by the installation of other AC sources available on the sites. (This has been proposed as a measure to further increase the plant's resistance against a loss of electric power supply).

**The ultimate heat sink** (UHS) for Dukovany and Temelín NPPs units is the surrounding atmosphere. Unused heat from the operation of a unit on power or residual heat after the reactor shutdown may be removed into the ultimate heat sink – the atmosphere – by several methods. The transfer of heat between safety-important heat sources and the atmosphere is ensured by the Essential Service Water system.

Despite the fairly robust barriers and the defence – in-depth levels, based on the results of evaluation of safety margins for initiation events, loss of safety functions and measures for management of beyond-design basis and severe accidents at Dukovany and Temelín NPPs, it is possible to conclude that for the highly improbable beyond-design basis situations, some opportunities have been identified for further improvement of safety/resistance of the power plant.

Each identified opportunity was classified from the viewpoint of importance for the size of safety margin, i.e. resistance against a potential loss of ability to perform basic safety functions and preparedness to manage the resulting situation. When assessing a significance of the risks, the number of defence in-depth levels was taken into account which would have to fail before the occurrence of the given situation and the time for which the unit is able to resist with the existing safety margins. Until then it is necessary to have sufficient means to ensure the required functions or to adopt subsequent protective measures to limit irradiation and to protect persons.

The improvement measures, identified for the Dukovany NPP, are:

- diverse means to make up water and to remove heat from steam generators, reactor core and spent fuel storage pools,
- increasing the capacity of the system for the liquidation of post-accidental hydrogen,
- development of “shutdown SAMG“ for outage/severe accident in spent fuel storage pools,

- adding radiological situation measurements on spent fuel storage pools into the Post Accident Monitoring System,
- cooling of the melt from outside the Reactor Pressure Vessel,
- analyses of usability of the equipment for SAMG,
- training of severe accident scenarios management.

The improvement measures, identified for the Temelín NPP, are:

- diverse means to make up water and to remove heat from steam generators, reactor core and spent fuel storage pools,
- alternative supply of diesel fuel from a tank to ensure long-term operation of diesel generators,
- alternative making-up of water into the containment sump,
- implementation of the system for hydrogen liquidation in the containment for severe accidents,
- localization of the core melt outside or inside the Reactor Pressure Vessel,
- verification of functions of the equipment in beyond-design operating conditions,
- development of “shutdown SAMGs” (fuel damage in case of open reactor/in spent fuel storage pools),
- increasing the capacity of the system for liquidation of post-accidental hydrogen,
- increasing the coolant supply in the containment to be used for emergency making-up,
- ensuring the habitability of main control room and emergency control room after transition of a severe accident into the ex-vessel phase,
- analyses of usability of the equipment for SAMGs,
- training of management in severe accident scenarios.

## **10 Article 8d: On-site emergency preparedness and response**

Paragraph 1 - Organizational structure for on-site emergency preparedness and response

### **Legal requirements**

The organizational structure for on-site emergency preparedness and response is embedded in the Atomic Act and its implementing legislative acts (concretely Decree No. 359/2016 Coll., Decree No. 408/2016 Coll., Decree No. 21/2017 Coll.). Moreover, Article 152 of the Atomic Act provides for an additional legislative guidance saying that when managing radiation extraordinary event in matters not regulated by the Atomic Act it shall be proceeded by the Act on Integrated Rescue System or the Act on Crisis Management.

The definitions of the emergency preparedness (*in Czech terminology - radiation extraordinary event response preparedness*) and response (*in Czech terminology - radiation extraordinary event response*) is contained in Article 151 of the Atomic Act, whereas Article 155 para 1 of the Atomic Act defines all activities that falls under emergency preparedness.

The requirement for “clear allocation of responsibilities between the license holder, and competent authorities and organisations” is fully attained as all legally binding provisions and duties are imposed on concrete entities. License holder’s obligations focused on:

- radiation extraordinary event response preparedness are laid down in Article 156 of the Atomic Act,
- response to a radiation extraordinary event are laid down in Article 157 of the Atomic Act.

These obligations are precised in the Decree No. 359/2016 Coll., on Details of Ensuring Radiation Extraordinary Event Management.

Duties of the SÚJB in the area of emergency preparedness and response are listed mainly in Article 209 of the Atomic Act.

Obligations of other authorities are laid down mainly in Articles 210, 211, 213, 214, 220, 224 and 225 of the Atomic Act.

Article 29 para 1 letter a) of the Atomic Act stipulates that a license holder according to Article 9 para 1 of the Atomic Act needs to introduce and maintain a management system. In the context of their management systems, the license holders shall inter alia determine the organizational structure and interactions between organizational units, personnel and other persons and define the rights and obligations of personnel and methods of communication between them so that they effectively contribute to ensuring and increasing the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security (Article 29 para 3 of the Atomic Act). Those obligations are more detailed in Decree No. 408/2016 Coll.. The clear allocation of responsibilities of license holder's personnel is ensured.

The general obligation of the license holder set up in Article 49 para 1 letter u) of the Atomic Act (a license holder needs to introduce processes and activities, the purpose of which is to prevent accident conditions at a nuclear installation from escalating and mitigate their consequences, document them and continuously update them) is detailed in Articles 26 to 30 of Decree No. 21/2017 Coll.

Paragraph 2 - Consistency and continuity between the on-site emergency preparedness and response arrangements required by the national framework

### **Legal requirements**

The Atomic Act contains several provisions aiming at ensuring consistency between the on-site emergency preparedness and response arrangements and other emergency preparedness and response arrangements.

Article 156 para 2 letter h) of the Atomic Act lays down an obligation of holders of a license for the performance of activities related to the use of nuclear energy for which an emergency planning zone has been established to verify, by means of exercises and tactical exercises, in cooperation with the competent public administration authorities and integrated rescue system units, the accuracy, efficiency and mutual consistency between on-site and off-site emergency plans and their consistency with the national radiation emergency plan. (*On-site emergency plan is drawn up for nuclear installation grounds or ionizing radiation sources workplace - requirements for the content of the on-site emergency plan are listed in Annex 6 to Decree No. 359/2016 Coll. Off-site emergency plan is drawn up for emergency planning zone, whereas the emergency planning zone is established around a nuclear installation grounds or a category IV workplace - requirements for the content of the establishment of emergency planning zone are listed in Annex 2 to Decree No. 359/2016 Coll. The national radiation emergency plan is drawn up for the territory of the Czech Republic - requirements for the content of the national radiation emergency plan are listed in Annex 8 to Decree No. 359/2016 Coll.*). The method and frequency of verification of the efficiency and mutual consistency between on-site emergency plans, off-site emergency plans and the national radiation emergency plan is set up in Decree No. 359/2016 Coll. Article 18 para 1 of the aforementioned Decree lays down an obligation to check the efficiency and consistency of the on-site emergency plan, off-site emergency plan and the national radiation emergency plan

- by joint practising the scenario for radiation accident in a nuclear installation or a category IV workplace, which has the emergency planning zone established and which is included in threat category A or B, once every four calendar years; and
- by evaluating the practising carried out.

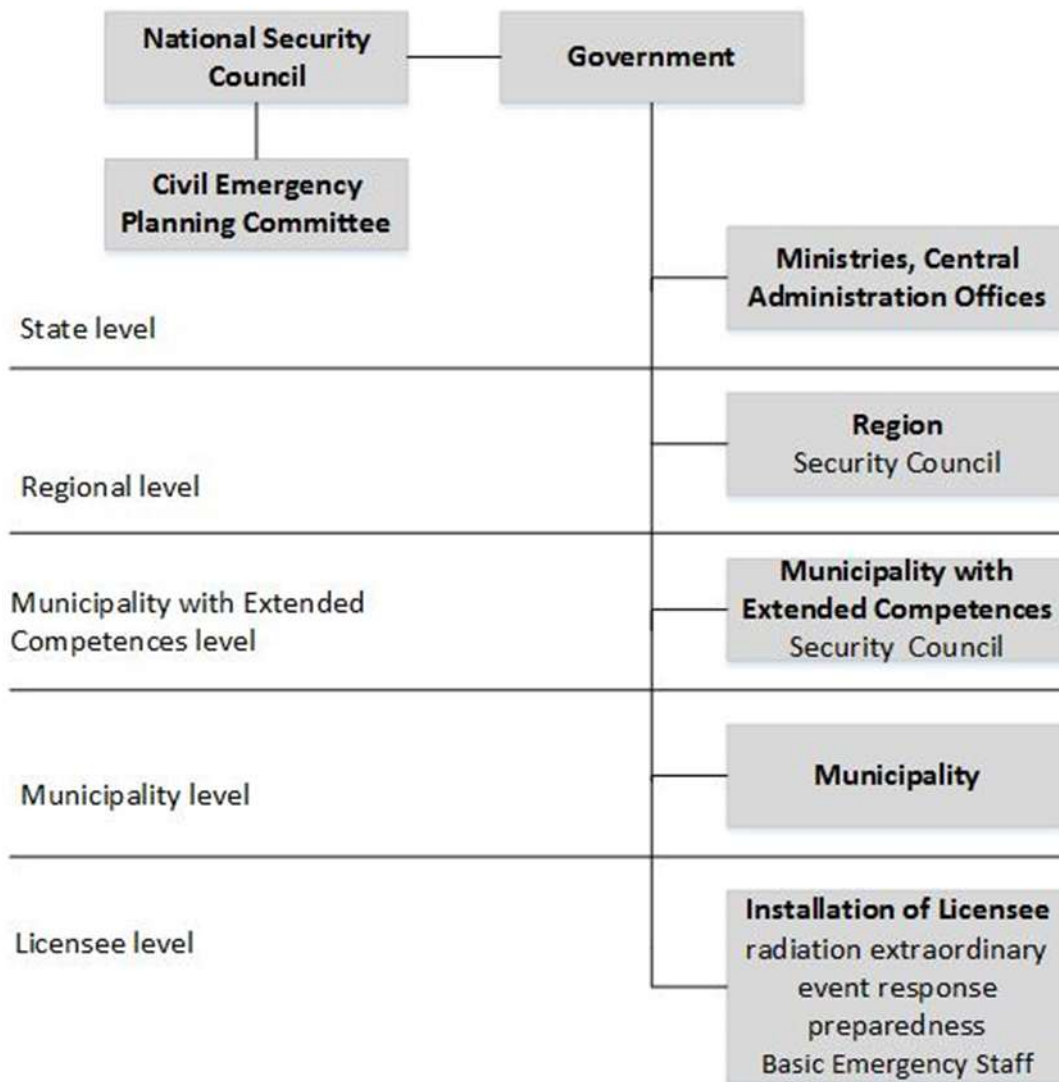
Article 18 para 2 Decree No. 359/2016 Coll. contains a provision ensuring correction of identified deficiencies. Any identified deficiencies, which have an impact on the content of the on-site emergency plan or the national radiation emergency plan, shall be remedied without delay by updating the plans.

Consistency between on-site emergency plans, off-site emergency plans and the national radiation emergency plan is ensured also via provisions of the Atomic Act ensuring that the processors of the respective plans work with relevant, corresponding and up-to date data. License holders are obliged to provide supporting documents for the drawing up of the off-site emergency plan to the Fire Rescue Service of the Czech Republic and regional authorities, and for drawing up the national emergency plan to the Office and the Ministry of the Interior (Article 156 para 2 letter b) of the Atomic Act). Ministries, Fire Rescue Service of the Czech Republic, regional offices and presidents of regions and municipal offices of municipalities with extended authorities and other administrative authorities are obliged not only to forward to the Office and to the Ministry of the Interior support documents for drawing up or updating the national radiation emergency plan but also to methodically direct and control their subordinate units and unify their approaches when drawing up partial plans for the specific activities under the off-site emergency plan that are attributed to them (Article 211 para 1 letter a), b) of the Atomic Act).

#### Example

In accordance with the legal regulations, in particular in the area of crisis management, a structure of the crisis preparedness system was established in the Czech Republic for the case of crisis situations of different types. Picture No. 5 shows the basic diagram of the structure of the crisis preparedness system for the case of a radiation accident.

Picture No. 5 Basic diagram of the Czech Republic crisis preparedness structure for the case of a radiation accident



On-site and off-site emergency plans are the important documents in the emergency preparedness and emergency response system in the Czech Republic for the case of radiation extraordinary events. On-site emergency plans - in accordance with Decree No. 359/2016 Coll., the operator of NPP or workplace with ionizing radiation sources is obliged, in order to ensure emergency preparedness, to create adequate organizational and staffing conditions so that in the case of the occurrence of extraordinary events, NPP personnel are prepared to immediately respond to the situation occurred and take up the pre-planned activities aimed at suppressing the negative effects and consequences, and at ensuring the radiation protection of individuals.

Off-site emergency plans are elaborated for the established emergency planning zone by territorially competent Regional Fire Rescue Service in accordance with the requirements laid down by Act No. 239/2000 Coll., and Decree No. 328/2001 Coll. The off-site emergency plan is elaborated on the basis of underlying information provided by NPP operator and on the basis of partial underlying documents prepared by competent regional offices, Integrated Rescue System and municipalities. The elaborated off-site emergency plans are discussed with NPP operator and with the SÚJB and the Ministry of Interior – General Directorate of Fire Rescue Service of the Czech Republic (hereinafter referred to as “MV – GŘ HZS ČR”).

### **10.1.1 Preparedness for response to radiation extraordinary event.**

#### *10.1.1.1 Categorization of radiation extraordinary events*

Radiation extraordinary event means an event that leads or may lead to exceeding of exposure dose limits and requires actions to prevent the exceeding of the limits or deterioration of the situation from the standpoint of radiation protection assurance. To assess significance of radiation extraordinary events, which may occur during the performance of radiation activities on a nuclear installation, these events are divided into three basic categories (Article 4 of the Atomic Act):

- a) first degree radiation extraordinary event means a radiation extraordinary event that can be handled by forces and means of the operators or shift personnel of the person whose activities gave rise to the radiation extraordinary event,
- b) radiation incident means a radiation extraordinary event that cannot be handled by forces and means of the operators or shift personnel of the person whose activities gave rise to the radiation extraordinary event or has resulted from the finding, misuse or loss of a radionuclide source which does not require taking urgent action to protect the general public,
- c) radiation accident means a radiation extraordinary event that cannot be handled by forces and means of the operators or shift personnel of the person whose activities gave rise to the radiation extraordinary event or has resulted from the finding, misuse or loss of a radionuclide source which requires taking urgent action to protect the general public.

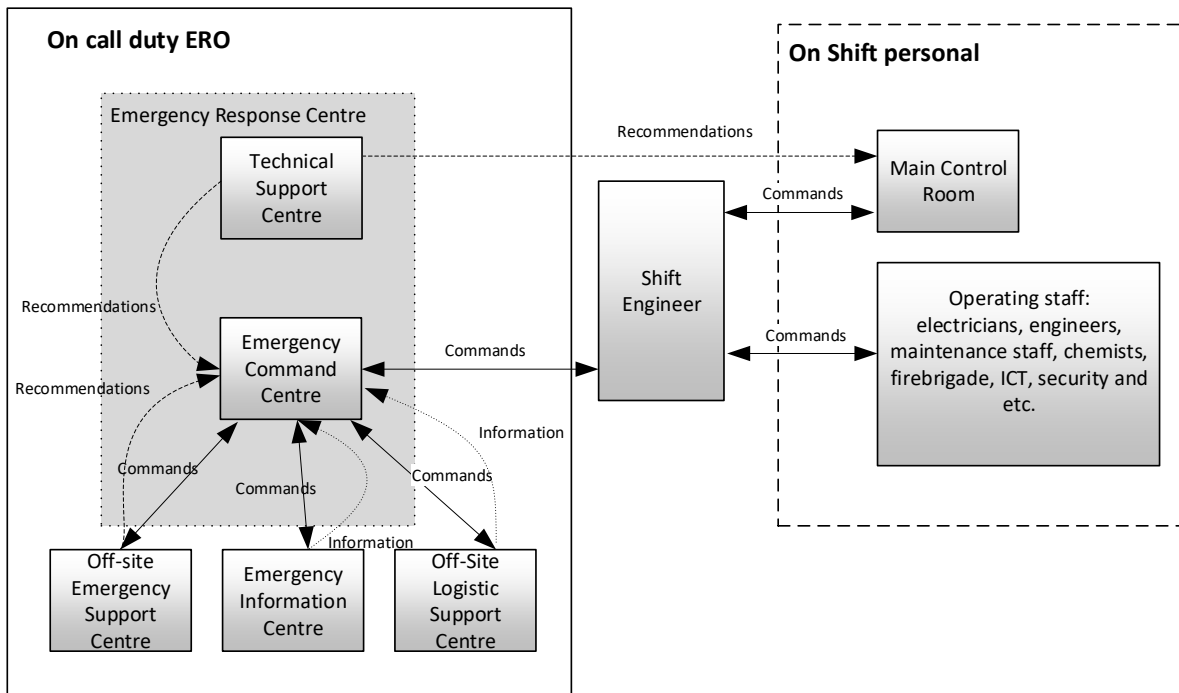
#### *10.1.1.2 Ensuring preparedness for response to radiation extraordinary event at the license holder*

Emergency response organizations (ERO)

Response during the origination of a radiation extraordinary event at NPP is always ensured in the first phase of the development of a radiation extraordinary event by on shift personnel (IERO – internal emergency response organization), under the management of the shift engineer. In cases where the event is, by its scope, outside the framework of the capacities of on shift personnel, IERO is completed by employees who are on call duty within the ERO (On call duty ERO). In this case, the Head of Emergency Command Centre (ECC) takes over responsibility for managing the response after mobilization of ECC from the Shift Engineer.

Picture No. 6 Structure of the emergency response organization at EDU/ETE

## Emergency Response Organization (ERO)



### Internal Emergency Response Organization (IERO)

The IERO consists solely of shift personnel, i.e. employees, who ensure normal operation of a nuclear installation. The continuous shift personnel ensure all activities according to the instructions from the shift engineer, relating to eliminating any signs of occurring extraordinary event until the activation of employees who are on stand-by duty within the ERO.

### Shift Engineer

In case of radiation extraordinary event occurrence, the Shift Engineer is responsible for the management of response until the Shift Engineer transfers the responsibility to the mobilized Head of ECC. The Shift Engineer activities during the radiation extraordinary event occurrence follow the intervention instruction for shift engineer, which includes all responsibilities and competences; the basic responsibilities and competences include: categorization of radiation extraordinary event, notification and warning of the NPP personnel and warning within the emergency planning zone, notification of nuclear power plant management and competent bodies and organizations on event occurrence, decision on the mobilization of the On call duty ERO, decision on protective measures for NPP personnel. Responsibility for managing the technology remains in the competence of the shift engineer.

### Operational MCR personnel

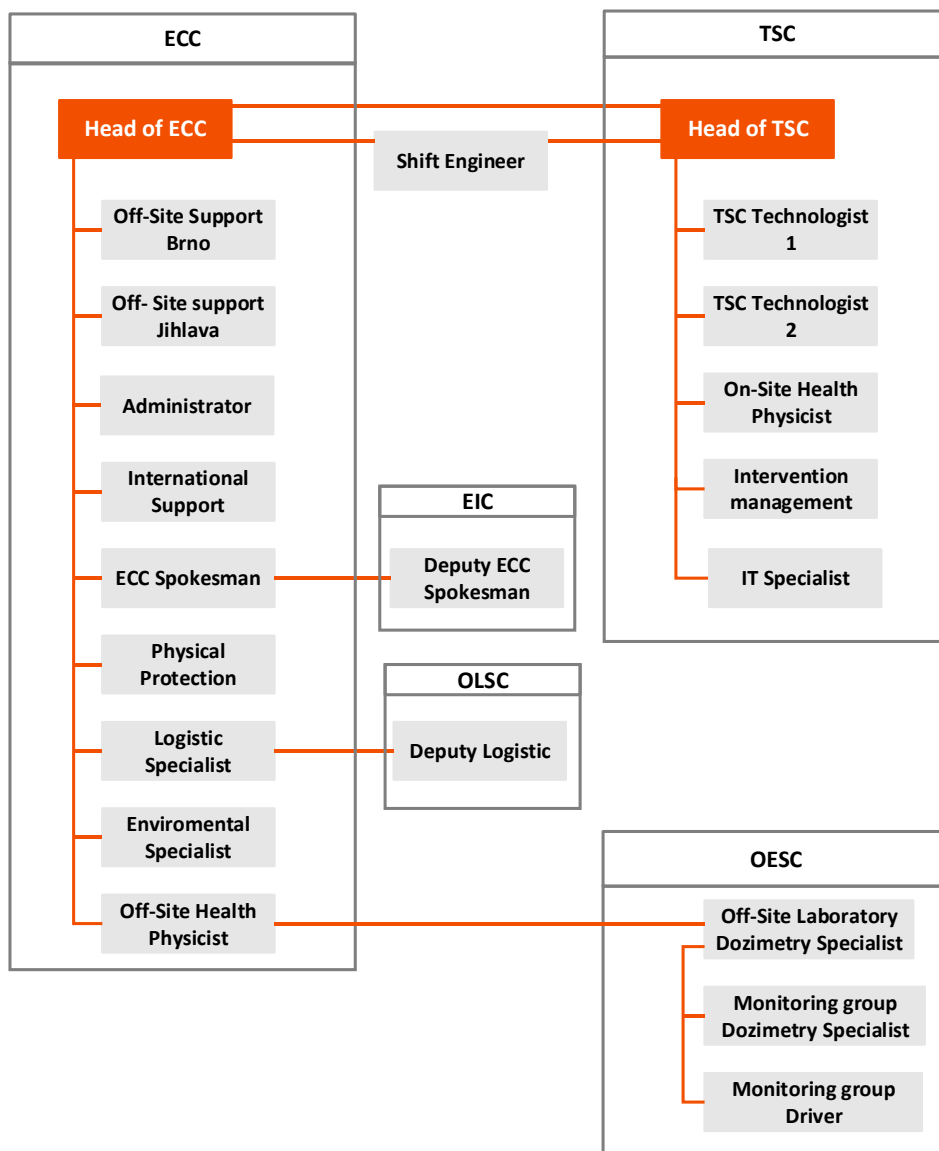
The MCR personnel having the basic workplace at the relevant MCR assure the control of each unit in case of a radiation extraordinary event occurrence. In case the MCR is uninhabitable, or in the case loss of the possibility of control of unit technology, the MCR personnel perform their activities from the stand-by workplace of the MCR. Safety engineer responsible for radiation extraordinary event management on the unit affected by a radiation extraordinary event is transferred to support the personnel of this unit of the Dukovany NPP.

## Other shift personnel

Other personnel of shift operation, depending on the degree of announcement of radiation extraordinary event, either continue to perform activities in accordance with the instructions of the shift management personnel, or hide in the shelter (i.e. at the EDU in the shelter on building PB II and at the ETE in the shelter under building PB) where, under the guidance of the shift engineer, MCR personnel or TSC function Intervention management, they perform the required actions on the technology.

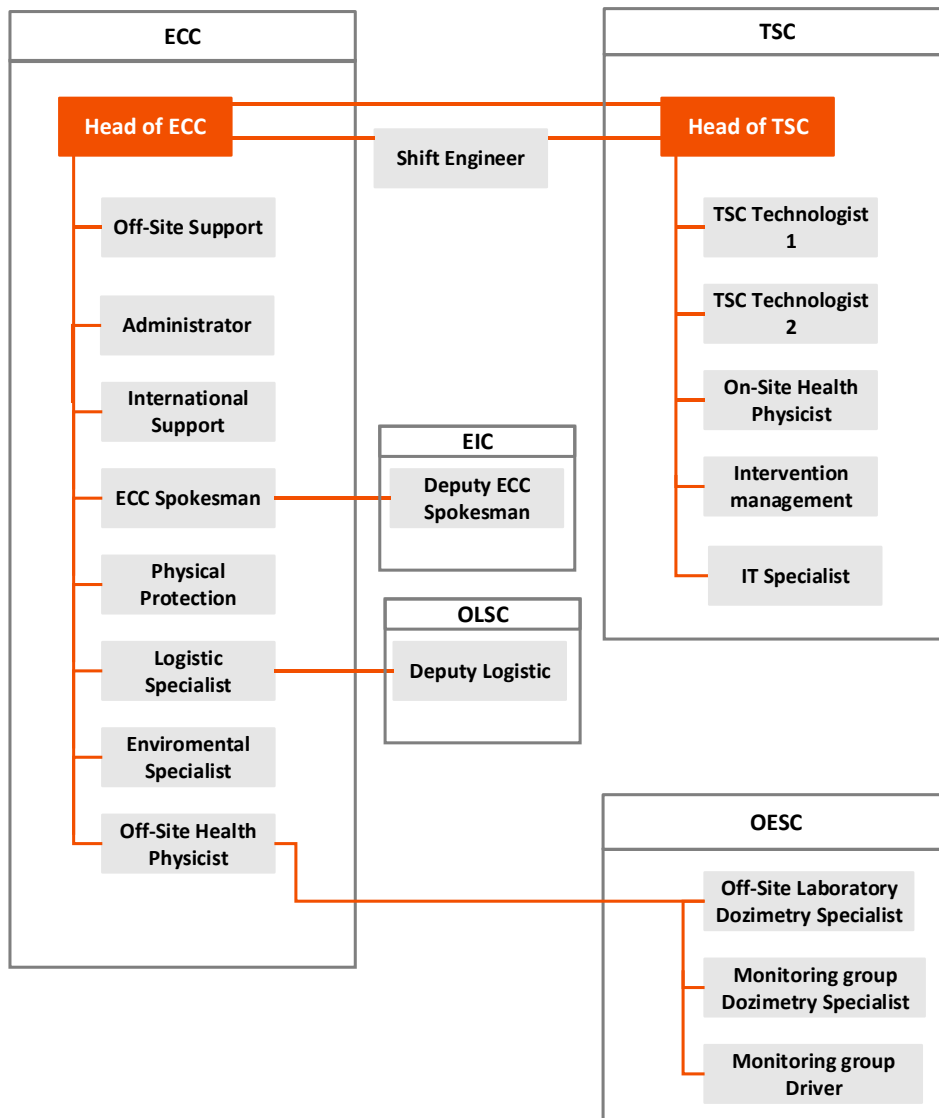
## On call duty ERO

Picture No. 7 – Structure of the On call duty ERO at EDU





Picture No. 8 – Structure of the stand-by emergency response organization at ETE



The On call duty ERO is composed of emergency response facilities staff:

### Emergency Command Centre (ECC)

ECC personnel provides communication and information transfer to the Crisis staff of ČEZ, a. s., and regulatory bodies, information to the general public and announcement of protective measures for persons in the area of a nuclear installation during a radiation extraordinary event. In addition, an ECC personnel secures the deliveries of necessary material, special means, and alternating the personnel as well as its maintenance and supplies. The activities of individual members of the ECC are defined in the On-site Emergency Plan of NPP and in intervention instructions for individual members of the On call ERO. The structure of ECC EDU is shown in the left part of Picture No. 7. The structure of ECC ETE is shown in the left part of Picture No. 8.

### Technical Support Centre (TSC)

Technical Support Centre personnel handles the recommendations for the MCR personnel of the affected unit in dealing with radiation extraordinary events. The TSC personnel also ensures immediate evaluation of nuclear power plant condition in consideration of nuclear safety and radiation protection; has control over the activity of intervention groups in response to radiation extraordinary event; is able to prepare inputs and recommendations for decision-making and control activities of the ECC. If required by shift engineer or Head of the ECC, support can be requested for TSC personnel from other specialists. The structure of TSC EDU is shown in the right part of Picture No. 7. The structure of TSC ETE is shown in the right part of Picture No. 8.

#### **Off-site Emergency Support Centre (OESC)**

Off-site Emergency Support Centre staff is responsible for managing activities related to radiation monitoring, evaluation of radiation situation in the emergency planning zone and prepares forecasts for the ECC on the impact of radiation extraordinary event on the population in the emergency planning zone.

#### **Off-site Logistics Support Centre**

Logistics Support Centre personnel provides the necessary material and technical resources and qualified human resources according to the requirements and needs of the ECC. The Logistics Support Centre is the external support of the ERO. The Logistics Support Centre in the Dukovany NPP is mobilized within the High Technical School, Třebíč and the Logistics Support Centre in the Temelín NPP is mobilized in the workplace in the K5 college of the University of South Bohemia in České Budějovice.

#### **Emergency Information Centre (EIC)**

Emergency Information Centre staff ensures, in the case of a radiation extraordinary event, the distribution of all information to mass media and the answering of questions from the public. The center is responsible for preparing press releases for mass media. The EIC in the Dukovany NPP is mobilized in the Information Centre or the Fire Rescue Service (FB) of the South Moravian Region. The EIC in the Temelín NPP is mobilized in the ECC or OESC or Press Center of the South Bohemian Region.

#### **Protection measures in a nuclear installation**

In the case of an event important to NPP safety, the shift engineer shall evaluate its severity. According to the assessment of the radiation situation, the state of technology and the expected development of the event, the shift engineer or Head of ECC shall announce individual protective measures for sheltering and assembly, ingestion of iodine prophylaxis and evacuation.

Justified urgent protective measures are:

- a) sheltering, if the averted effective dose is greater than 10 mSv over the period of sheltering lasting no longer than 2 days,
- b) stable iodine administration, if internal contamination by radioactive iodine is imminent, and the averted committed equivalent dose in the thyroid gland caused by iodine radioisotopes is greater than 100 mSv, or,
- c) evacuation, if the sum of the effective dose so far received in an emergency exposure situation when taking into account the effect of the already implemented protective measures and the effective dose, which could be averted, is greater than 100 mSv over the first 7 days.

#### **EDU shelters**

For the implementation of urgent protective measures for persons located in the nuclear installation, there are seven shelters in the Dukovany NPP.

All seven shelters (for 2450 persons) and both points of assembly are activated and used only in the case of the announcement of sheltering during working hours of non-shift employees on weekdays (Mon-Thu 7:00 a. m. to 3:00 p. m., Fri 7:00 a. m. to 12:30 p. m.). Outside the working hours, when the number of persons present in the area of the Dukovany NPP is low, only two shelters are activated.

One shelter is determined as priority to shelter shift personnel. In case of impossibility of using this shelter, substitute shelter is determined for sheltering shift personnel.

#### **ETE shelters**

For the implementation of urgent protective measures for persons located in the nuclear installation, there are four shelters in the Temelín NPP.

All four shelters (for 835 persons) and the two points of assembly are activated and used only during working hours (Mon-Wed 7:00 a. m. to 3:00 p. m., Fri 7:00 a. m. to 12:30 p. m.). Outside the working hours, when the number of persons present in the area of the Temelín NPP is low, only two shelters are activated.

#### *10.1.1.3 Overview of the arrangements and requirements of the regulatory body in the field of radiation extraordinary event management*

Applicable legislation is in compliance with the Directive 2013/59/Euratom.

The legal framework for the field of radiation extraordinary event management consists of the Atomic Act and its implementing decrees.

The field of emergency preparedness newly regulates a system of radiation extraordinary event management and is in conformity with the crisis management system in the Czech Republic, while respecting special rules necessary for the field of radiation extraordinary events.

International requirements and recommendations were taken into account in the Atomic Act, which have been made more stringent or at least clarified in many cases in the last 18 years. Last but not least, the Atomic Act made full use of the experience hitherto gathered in this field during inspections of emergency preparedness and during emergency exercises.

Details are set out in Decree No. 359/2016 Coll., on Details of Ensuring Radiation Extraordinary Event Management.

Article 156 of the Atomic Act imposes, besides general obligations, the obligation upon the holders of a license to ensure radiation extraordinary event response preparedness including its verification to the extent appropriate to individual licenses.

The provisions of Article 154 of the Atomic Act establishes, besides other obligations, the obligation of the holders of a license to draw up a radiation extraordinary event analysis and evaluation.

The provisions of Article 155 of the Atomic Act imposes upon the holders of a license the obligation to ensure education and training for radiation extraordinary event response and preparation for:

- the detection of radiation extraordinary events;
- the categorization of radiation extraordinary events that have arisen in categories;
- the declaration of a radiation extraordinary event and notification of the authorities concerned;
- the management and implementation of response to radiation extraordinary events;
- the restriction of accidental exposure;

- health matters;
- the provision of preliminary information to the general public;
- the checking of radiation extraordinary event response preparedness;
- the receipt of external assistance, and
- the documentation of radiation extraordinary event response preparedness, including the drawing up of on-site emergency plans, off-site emergency plans and the national radiation emergency plan, as well as emergency rule.

The Article 156 establishes that the license holders for the performance of activities related to the use of nuclear energy and for the performance of activities in exposure situations, for which an emergency planning zone has been established, shall:

- cooperate with State and territorial authorities and with the intervention units of the integrated rescue system to ensure radiation extraordinary event response preparedness in the case of a radiation accident in the emergency planning zone;
- provide supporting documents for the drawing up of the off-site emergency plan, to the Fire Rescue Service of the Czech Republic and regional authorities;
- provide supporting documents for the drawing up of the national radiation emergency plan to SÚJB and the Ministry of the Interior;
- provide for radiation situation monitoring systems at the nuclear installation grounds and in the emergency planning zone and take part in radiation situation monitoring in the territory of the Czech Republic;
- in cooperation with the competent regional Authority or the Fire Rescue Service of the Czech Republic, ensure that the general public and the integrated rescue system units intervening to radiation accidents in the emergency planning zone are provided with iodine prophylaxis antidotes;
- provide basic information to the general public in the emergency planning zone for the case of a radiation accident and update it regularly; basic information for the case of a radiation accident may only be provided or updated on the basis of an affirmative statement of the SÚJB, the Fire Rescue Service of the Czech Republic and the president of the region;
- provide for a system of notification of the authorities concerned;
- acquire, maintain and operate warning system terminals in the emergency planning zone;
- verify, by means of exercises and tactical exercises in cooperation with the competent public administration authorities and integrated rescue system units, the accuracy, efficiency and mutual consistency between on-site and off-site emergency plans and their consistency with the national radiation emergency plan;
- participate in the evaluation of the exercises and tactical exercises as mentioned above and, on the basis of the results of the evaluation, take measures to remedy the deficiencies found;
- immediately inform the SÚJB of the provision of supporting documents for the drawing up of the off-site emergency plan to regional authorities and the Fire Rescue Services of the Czech Republic and of their content, and
- draw up an annual report on radiation extraordinary events response preparedness in the course of the activities performed by the license holder and submit it to the SÚJB by 31 January of the following calendar year.

Pursuant to Article 157, the license holders shall ensure a response to a radiation extraordinary event that has arisen in the course of the activities performed by them, in accordance with the relevant on-

site emergency plan, emergency rules or, if the on-site emergency plan is not drawn up, intervention instructions.

Furthermore, pursuant to Article 209 of the Atomic Act, the SÚJB shall:

- ensure and conduct drills and emergency exercises for radiation extraordinary event response;
- in cooperation with the Ministry of the Interior, draw up the national radiation emergency plan for threat categories A, B, D and E in accordance with Article 153 para 1 of the Atomic Act;
- provide preliminary information to the general public for the event of a radiation accident, concerning protective measures and steps that need to be taken to ensure radiation protection; the preliminary information provided shall be up-to-date and constantly available and it shall be provided automatically and repeatedly, at regular intervals and whenever a significant change occurs;
- issue proposals for urgent protective actions or follow-up protective actions, in accordance with the national radiation emergency plan and on the basis of the results of the radiation situation monitoring carried out, or to further specify or withdraw the action and to confirm or further specify proposals for the introduction of urgent protective action issued by license holders;
- ensure information of the general public about the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic outside an emergency planning zone and about the steps and measures to be taken during the various stages of development of the radiation accident, unless this information is being provided by another administrative Authority;
- participate, within the scope of its competence, in the provision of information about the occurrence and the course of a radiation accident within an emergency planning zone;
- ensure that the competent regulatory authorities of neighbouring Member States of the Euratom are notified of the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic and about the steps and measures to be taken during the various stages of development of the radiation extraordinary event;
- ensure that an international peer review is invited immediately in the case of a radiation accident that has occurred in the territory of the Czech Republic and led to the implementation of protective measures outside a nuclear installation grounds;
- provide information about the adoption of measures to protect the general public in the Czech Republic in the event of a radiation accident arisen in the territory of Member States of the Euratom to the European Commission and other Member States of the Euratom which may be affected by these measures and, in accordance with the Czech Republic's international commitments, provide public access to information thus obtained;
- ensure notification of regional authorities about the occurrence and the course of a radiation accident outside the territory of the Czech Republic and about the steps and measures to be taken in the course of the radiation extraordinary event.

The details and requirements in the field of extraordinary event management are set out in implementing regulations to the Atomic Act:

- **Decree No. 359/2016 Coll.**, on Details of Ensuring Radiation Extraordinary Event Management;
- **Decree No. 422/2016 Coll.**, on Radiation Protection and Security of a Radioactive Source.

Further requirements are laid down by Act No. 239/2000 Coll., on the Integrated Rescue System and on amendments to some acts, as amended and by Act No. 240/2000 Coll., on Crisis Management and on amendments to some acts (Crisis Act), as amended.

Implementing legal regulations were added to the above-mentioned acts, which are, among others, related to emergency preparedness assurance and crisis management in the field of utilization of nuclear energy and ionizing radiation.

The relevant details are governed by:

- **Decree No. 328/2001 Coll.**, on some details in ensuring of the integrated rescue system, as amended,
- **Decree No. 380/2002 Coll.**, for the preparation and performance of tasks for population protection,
- **Government Regulation No. 462/2000 Coll.**, for the implementation of Article 27 para 8 and Article 28 para 5 of Act No. 240/2000 Coll., as amended,
- **Government Regulation No. 432/2010 Coll.**, on criteria for defining critical infrastructure elements, as amended.

## 11 Article 8e: Peer reviews

Assessments of the national framework and competent regulatory authorities

General obligation of the Czech Republic to arrange, at least once per 10 years, for periodic self-assessments of their national framework and competent regulatory authorities, invite an international peer review of relevant segments of their national framework and competent regulatory authorities with the aim of continuously improving nuclear safety and report outcomes of such peer reviews to the Member States and the Commission, when available, finds its implementation in general legal principles of central administrative bodies. According to Article 25 of the Act No. 2/1969 Coll., the SÚJB ensures within its competence tasks related to negotiating international agreements, to development of international relations and international co-operation. The SÚJB ensures tasks for the Czech Republic based on international agreements and on membership in international organizations. As stipulated by Article 20, the SÚJB fulfills under its competency tasks resulting from a membership of the Czech Republic in European Union and in other integrational structures and international organizations, if binding for the Czech Republic. Since the NSD directly imposes obligation to perform periodic self-assessments and invite an international peer review at least once per 10 years, the SÚJB do all necessary steps to comply with this EU requirements directly on a basis of the aforementioned provisions of the Act No. 2/1969 Coll.

However, the Atomic Act provides even more specific legal tool for implementing those NSD obligations. Its Article 208 letter k) empowers the SÚJB to ensure international cooperation within the field of its competence, provide information from the field of its competence to the International Atomic Energy Agency, the European Commission and other authorities of the Euratom and ensure implementation of other obligations arising from Euratom legislation relating to, in particular, the national and international evaluation of the exercise of State Authority over nuclear safety of nuclear installations and management of nuclear materials and high-activity sources.

Reporting of the results of the self-assessments and international peer reviews to other member states is based on the same provision of international cooperation. Moreover, many informational exchange agreements are concluded with other EU member states, as already explained above on this report.

### 11.1.1 10 year peer review – IAEA IRRT/IRRT missions

The first IAEA assessments were performed by two IRRT (“International Regulatory Review Team”) missions, which reviewed the SÚJB in January 2000 and in June 2001.

The first review was a reduced-scope inspection mission focusing mainly on SÚJB activities relating to the licensing procedure for Temelín NPP. The inspection team concluded its mission by following statements:

- there exists a clearly defined legal framework in place for Temelín NPP licensing and the SÚJB is required to issue a license for each defined key stage throughout the construction and acceptance period;
- the SÚJB has established requirements as the state regulatory body in respect to the level of nuclear safety assurance at Temelín NPP and has adopted a flexible approach to assure that the adopted inspection and assessment criteria are fulfilled;
- the SÚJB has in advance established inspection plan accordingly fulfilled by its inspectors who check on and confirm that the licensee is commissioning the plant in agreement with the conditions specified in the respective licenses;
- experience and assistance of regulatory bodies from West European countries and the USA have been employed to develop an appropriate state regulatory system in respect to licensing, supervision, assessment and inspecting of Temelín NPP.

Members of the reviewing team stated several recommendations to the SÚJB whose implementation might further strengthen performance of the state administration. All suggestions and recommendations concern the long-term development of the SÚJB and arise from current methodical procedures and the achieved results.

The second mission performed a full-scope review of state administrative activities in peaceful utilization of nuclear energy and ionizing radiation. Twelve experts from nine countries carried out a review of all aspects of state administrative activities performed by the SÚJB under the Atomic Act, including administration of nuclear safety, radiation protection, emergency planning and transports of radioactive materials.

According to the results presented by the experts in a final report from the mission, the experts concluded that both the legal framework and execution of the state administration of peaceful utilization of nuclear energy and ionizing radiation were at a very good standard, corresponding to worldwide accepted practices. In respect to the position of the regulatory body in the state administration structure, the experts highlighted the fact that the SÚJB was independent not only “de jure” but also “de facto”. The experts naturally also worded specific recommendations whose implementation may further increase the standard of administration in the Czech Republic. The recommendations focused on, for example, emergency preparedness practising and further development in utilization of probabilistic assessment methods in nuclear safety. It was expressly stated, however, that these recommendations were mostly intended for the long-term development of the SÚJB.

IRRT missions reports are available at:

[https://www.sujb.cz/fileadmin/sujb/docs/zpravy/ostatni\\_zpravy/IRRT\\_mission.pdf](https://www.sujb.cz/fileadmin/sujb/docs/zpravy/ostatni_zpravy/IRRT_mission.pdf)

[https://www.sujb.cz/fileadmin/sujb/docs/zpravy/ostatni\\_zpravy/IRRT\\_mission\\_1.pdf](https://www.sujb.cz/fileadmin/sujb/docs/zpravy/ostatni_zpravy/IRRT_mission_1.pdf)

Repeated IRRS mission took place in November 2013.

The IRRS mission in 2013 again reviewed the regulatory framework of the Czech Republic in the performance of the regulatory body in the area of peaceful utilization of nuclear energy and ionizing radiation by comparing to the IAEA standards and generally accepted international criteria. Moreover, the mission was used for information exchange between SÚJB experts and inspection team members. The mission focused on responsibilities and functions of the executive power in the field of nuclear safety including regulatory responsibilities and functions, management system and activities of the SÚJB including preparation, content and issuing of safety guides, legal system – issuing of licenses, documentation approval and inspection activity, safety assessment, emergency preparedness including response to radiological emergency, protection of the population and the environment from

ionizing radiation, regulation of the doses of ionizing radiation, transportation of radioactive substances, radioactive waste management and decommissioning, other nuclear installations including spent nuclear fuel storage facility and National Action Plan with proposed measures following the accident at the Fukushima Daiichi NPP. In addition, the issues of SÚJB strategy, policy and transparency have been discussed during the mission.

In particular, the set of the measures adopted to strengthen the safety of nuclear power plants in the Czech Republic on the basis of in-depth review following the accident at the Fukushima Daiichi NPP have been thoroughly examined by the members of mission. The National Action Plan for the strengthening of the safety of nuclear installations in the Czech Republic has already been adopted at the time of the mission and gradually implemented. The members of the IRRS mission noted that the Czech authorities have adequately assessed the lessons learned from the accident, and defined and scheduled the necessary corrective measures in both technical and legal areas.

In their summary at the close of the IRRS mission, the international experts marked the regulatory system for nuclear safety and radiation protection in the Czech Republic as “robust” and SÚJB as effective and independent regulatory body, respectively. The international experts concluded that the SÚJB employs technically qualified and well motivated staff. In a number of the areas, the experts of the team appreciated the activities carried out by the SÚJB as good international practice, which they recommend to other countries. They also presented some recommendations, which should contribute to strengthening and improving efficiency of the system of regulation of peaceful utilization of nuclear energy in the Czech Republic. Immediately after the evaluation mission, the SÚJB started work on drafting the internal Action Plan, under which the measures proposed by the IAEA mission are implemented in the Czech Republic.

#### IRRS Follow-up mission

The implementation of the results of the IRRS mission held in 2013 was examined by the follow-up mission in May 2017. A team of experts of the International Atomic Energy Agency in Vienna assessed the quality of the national regulatory framework and its compliance with safety standards of the Agency. The next review assessed the extent to which the Czech Republic, especially the SÚJB, cope with the recommendations and findings of 2013. During the mission, the SÚJB experts provided the foreign experts with explanation of the current state of the new Czech nuclear legislation and regulatory procedures of the SÚJB.

The IRRS expert team stated the successful completion of the vast majority of the requirements of 2013. In conclusion of the mission, representatives of the international agency stated that the new Atomic Act constitutes a solid basis for robust safety framework and the Czech Republic has made a considerable progress, especially in the field of human resources, long-term strategies, inspections and enforcement of legislative requirements. Only the topics of management system of the administrative authority, whose implementation is underway and should be completed in the coming years, remain open. Beyond the initial findings, the mission recommended to consider developing rules for taking corrective measures in the case of existing exposure situations. International experts highlighted SÚJB openness and direct communication with the public, in particular via the Internet, as good practice.

IRRS missions reports are available at:

[https://www.sujb.cz/fileadmin/sujb/docs/zpravy/IRRS\\_Czech\\_Republic\\_Final\\_Report.pdf](https://www.sujb.cz/fileadmin/sujb/docs/zpravy/IRRS_Czech_Republic_Final_Report.pdf)

[https://www.sujb.cz/fileadmin/sujb/docs/aktualne/Mise-IRRS/IRRS\\_Follow-up\\_Czech\\_Republic\\_Report.pdf](https://www.sujb.cz/fileadmin/sujb/docs/aktualne/Mise-IRRS/IRRS_Follow-up_Czech_Republic_Report.pdf)



### 11.1.2 Participation at the TPR

The first Topical Peer-Review (“TPR”), whose performance results from the Nuclear Safety Directive 2014/87/EURATOM of the EU, took place in Luxembourg in May 2018. Preparation for this review began in 2015 and the result of preparation was the National Assessment Report of the Czech Republic. The objective of the Peer-Review was to undertake a peer review of good practices in the area of ageing management, to identify strengths and weaknesses of established practices and to define areas for improvement. Further to share operating experience and also to provide a transparent and open framework for developing and implementing appropriate follow-up measures to address areas for improvement. The TPR includes all nuclear power plants and research reactors with a thermal power equal to 1 MWt, or more that were operating on 31 December 2017 or were under construction on 31 December 2016.

The groups of components were then set as examples of the implementation of the overall Ageing Management Programme, of which the following groups were covered by the scope of the TPR for the Czech Republic: electrical cables, concealed (inaccessible) pipework, reactor pressure vessels and concrete containment structures.

The National Assessment Report of the Czech Republic for TPR contains a description of the Overall Ageing Management Programme focusing on program aspects of the ageing management process, implementation of that Overall Ageing Management Programme and experience with the application of ageing management. The descriptive part is followed by the evaluation of compliance with the national and international requirements, identification of the strengths and weaknesses of the process and definition of the areas for improvement.

Czech Country Specific TPR Report is available at:

<http://www.ensreg.eu/country-specific-reports/EU-Member-States>

Assessment based on a specific topic related to nuclear safety of the relevant nuclear installations

The same legal base transposes even section 2 of Article 8e of NSD. However, in this case also the operator of the nuclear installation must be involved. Therefore Article 48 para 3 letter c) of the Atomic Act introduces a specific type of a special safety assessment. The licensee is then obliged to conduct a special safety assessment if so required by the SÚJB in a decision made in accordance with the requirements under an international agreement binding on the Czech Republic or a Euratom regulation, i.e. NSD. The SÚJB invites all other EU members states with regard to its general competency in international cooperation (as mentioned above).

Safety assessment, including a special safety assessment based on the NSD, must be used by the licensee to evaluate relevant information about the risks associated with the use of nuclear energy and to adopt measures to prevent compromising the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, radiation extraordinary event management and security. Similar obligation to take appropriate remedial measures is imposed even to the SÚJB by Article 22 of the Act No. 2/1969 Coll. – central governmental bodies analyze societal issues in their competences, analyze reached results and take measures to solve actual problems.

Publication of relevant reports is based on above mentioned requirements of the Act No. 106/1999 Coll.

International peer review in case of an accident

The SÚJB, as stipulated by Article 209 letter j) of the Atomic Act, ensures that an international peer review is invited immediately in the case of a radiation accident that has occurred in the territory of

the Czech Republic and led to the implementation of protective measures outside a nuclear installation grounds.

## 12 SUMMARY

The National Report of the Czech Republic has been prepared as required under Article 9.1 of the Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations.

The structure of the National Report is based on recommendations published as "ENSREG Guidelines regarding Member States Reports as required under Article 9.1 of the Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations - HLG\_p (2012-21)\_108".

The Czech Republic is a member of international organizations dealing with nuclear matters (e.g. IAEA, NEA/OECD) and is a part of relevant international conventions, esp. Nuclear Safety Convention and Joint Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Under these convention's regime, it regularly reports about the nuclear installations operated in the Czech Republic every three years. National reports describing all nuclear installations, including approaches to ensurance of their nuclear safety and radiation protection of the staff and public during whole life cycle of them, were published.

At the request of the Government of the Czech Republic, an international team of senior safety experts met representatives of the SÚJB from 18 to 29 November 2013 to conduct an Integrated Regulatory Review Service (IRRS) mission. The purpose of the peer review was to review the Czech regulatory framework for nuclear and radiation safety. As recommended by the IAEA Nuclear Safety Action Plan, special attention was given to regulatory implications for nuclear safety in the Czech Republic in the light of the TEPCO-Fukushima Dai-ichi accident. The IRRS review team identified a number of good practices and made recommendations and suggestions for improvements to enhance the effectiveness of the regulatory framework and functions in line with the IAEA Safety Standards. The IRRS Team recognized that the IRRS findings broadly correlated with the action plan prepared by the SÚJB as a result of the self-assessment.

The IRRS review team made the following general observations:

- the Czech regulatory system for nuclear and radiation safety is robust;
- the SÚJB is an effective and independent regulatory body;
- the Czech Republic actively participates in the global safety regime;
- the SÚJB benefits from experienced, technically competent and well-motivated staff.

The National Report demonstrates, in the view of the Czech Republic, the full compliance with all requirements of the Council Directive 2009/71/Euratom.

## 13 Annex 1 - List of Legislation

### 13.1.1 Nuclear law in force before 1st January 2017

**Act No. 18/1997 Coll.**, on the peaceful utilization of nuclear energy and ionizing radiation (**the Atomic Act**) and on Amendments and Alterations to Some Acts, as amended

- Decree No. 144/1997 Coll., on the physical protection of nuclear materials and nuclear facilities and their classification, as amended by SÚJB Decree No. 500/2005 Coll.;
- Decree No. 146/1997 Coll., specifying activities directly affecting nuclear safety and activities especially important from radiation protection viewpoint, requirements on qualification and personnel training, on methods to be used for verification of special professional competency and for issue authorizations to selected personnel, and the form of documentation to be approved for the licensing of expert training of selected personnel, as amended by SÚJB Decree No. 315/2002 Coll.;
- Decree No. 215/1997 Coll., on criteria for siting of nuclear installations and very significant ionizing radiation sources;
- Decree No. 106/1998 Coll., on nuclear safety and radiation protection assurance during commissioning and operation of nuclear facilities;
- Government Regulation No. 11/1999 Coll., on emergency planning zones;
- Decree No. 195/1999 Coll., on basic design criteria for nuclear installations with respect to nuclear safety radiation protection and emergency preparedness;
- Decree No. 307/2002 Coll., on radiation protection, as amended by SÚJB Decree No. 499/2005 Coll. and SÚJB Decree No. 389/2012 Coll.;
- Decree No. 317/2002 Coll., on type-approval of packagings for shipment, storage and disposal of nuclear materials and radioactive substances, on type-approval of ionizing radiation sources and shipment of nuclear material and specified radioactive substances (on type-approval and shipment), as amended by SÚJB Decree No. 317/2002 Coll. and SÚJB Decree No. 77/2009 Coll.;
- Decree No. 318/2002 Coll., on details of emergency preparedness of nuclear facilities and workplaces with ionizing radiation sources and on requirements on the content of on-site emergency plan and emergency rule, as amended by SÚJB Decree No. 2/2004 Coll.;
- Decree No. 319/2002 Coll., on function and organization of the National Radiation Monitoring Network, as amended by SÚJB Decree No. 27/2006 Coll.;
- Decree No. 360/2002 Coll., establishing a method to create a financial reserve for decommissioning of nuclear installations or workplaces in categories III or IV;
- Government Regulation No. 416/2002 Coll., on the amount and terms of payments to the nuclear account by radioactive waste producers and the annual subsidy to the communities and the rules for its payment, as amended by Government Regulation No. 46/2005 Coll., Government Regulation No. 341/2009 Coll. and Government Regulation No. 461/2011 Coll.;
- Decree No. 419/2002 Coll., on personal radiation passes;
- Decree No. 185/2003 Coll., on the decommissioning of nuclear installations or workplaces of category III or IV;
- Decree No. 193/2005 Coll., sets the list of theoretical and practical areas forming the education and preparation content required in the Czech Republic for the performance of regulated activities belonging to the competence of the SÚJB;
- Decree No. 309/2005 Coll., on assurance of technical safety of selected equipment;
- Decree No. 461/2005 Coll., on the procedure for providing subsidies intended for the introduction of measures leading to a reduction of indoor exposure to natural radionuclides and a reduction of natural radionuclide concentration in drinking water appointed for public supply;

- Decree No. 462/2005 Coll., on the distribution and collection of detectors intended for identification of buildings with an increased level of exposure to natural radionuclides and on conditions for acquirement of state budget subsidy;
- Decree No. 132/2008 Coll., on a Quality Assurance System in carrying out activities connected with utilization of nuclear energy and radiation protection and on Quality assurance of selected equipment in regard their assignment to classes of nuclear safety;
- Government Regulation No. 73/2009 Coll., on information exchange related to the international transport of radioactive waste and spent fuel;
- Decree No. 165/2009 Coll., establishing a list of Trigger list items;
- Decree No. 166/2009 Coll., establishing a list of selected items of dual use in the nuclear area;
- Decree No. 213/2010 Coll., on accounting for and control of nuclear material and on reporting of data required by EC regulations;
- Government Regulation No. 399/2011 Coll., on fees for professional activities of the State Office for Nuclear Safety.

### **13.1.2 Nuclear law in force since 1st January 2017**

**Act No. 263/2016 Coll., the Atomic Act**, as amended

**Act No. 18/1997 Coll.**, on the peaceful utilization of nuclear energy and ionizing radiation (the Atomic Act) and on Amendments and Alterations to Some Acts, as amended

- Government Regulation No. 347/2016 Coll., on fees for professional activities of the State Office for Nuclear Safety;
- Decree No. 358/2016 Coll., on requirements for assurance of quality and technical safety and assessment and verification of conformity of selected equipment;
- Decree No. 359/2016 Coll., on details of ensuring radiation extraordinary event management;
- Decree No. 360/2016 Coll., on radiation situation monitoring;
- Decree No. 361/2016 Coll., on security of nuclear installation and nuclear material;
- Decree No. 362/2016 Coll., on the conditions for the award of the grant from the state budget in some existing exposure situations;
- Decree No. 374/2016 Coll., on the accountancy and control of nuclear materials and reporting of information on them;
- Decree No. 375/2016 Coll., on selected items in the nuclear area;
- Decree No. 376/2016 Coll., on dual-use items in the nuclear area;
- Decree No. 377/2016 Coll., on the requirements for the safe management of radioactive waste and on the decommissioning of nuclear installations or category III or IV workplaces;
- Decree No. 378/2016 Coll., on siting of a nuclear installation;
- Decree No. 379/2016 Coll., concerning the approval of some products in the field of peaceful use of nuclear energy and ionizing radiation and the carriage of radioactive or fissile material;
- Decree No. 408/2016 Coll., on management system requirements;
- Decree No. 409/2016 Coll., on activities especially important from nuclear safety and radiation protection viewpoint, special professional qualification and training of persons ensuring radiation protection of the registrant;
- Decree No. 422/2016 Coll., on radiation protection and security of a radioactive source;
- Decree No. 464/2016 Coll., On the procedure for providing subsidies from the state budget for the adoption of measures to reduce the level of radiation from the presence of radon and its transformation products in the indoor air of buildings for housing and public residence and for the adoption of measures to reduce the content of natural radionuclides in drinking water;
- Decree No. 21/2017 Coll., on nuclear safety assurance at nuclear installations;

- Governmental Regulation No. 35/2017 Coll., which sets the rate of a one-time fee for the disposal of radioactive waste and the amount of contributions from the nuclear account to municipalities and the rules for their provision;
- Decree No. 162/2017 Coll., on the requirements for nuclear safety assessment;
- Decree No. 329/2017 Coll., on the requirements for nuclear installation design;
- Decree No. 266/2019 Coll., on policy for radioactive waste management and spent fuel management;
- Decree No. 250/2020 Coll., on the method of establishing a reserve for the decommissioning of a nuclear installation and category III and category IV workplace.

### **13.1.3 Multilateral international treaties and treaties with IAEA**

Part of the valid Czech legislation in the given area includes the following international treaties signed by the Czech Republic (or the former Czechoslovak Socialist Republic and later the Czech and Slovak Federal Republic):

- The Convention on the Physical Protection of Nuclear Materials (in Vienna on October 26, 1979, communication of the MZV No. 27/2007 Coll.),
- The Convention on Early Notification of a Nuclear Accident (in Vienna on September 26, 1986, communication of the MZV No. 116/1996 Coll.),
- The Convention on Assistance in the Case of a Nuclear or Radiation Accident (in Vienna on September 26, 1986, communication of the MZV No. 115/1998 Coll.),
- The Convention on Nuclear Safety (in Vienna on June 17, 1994, communication of the MZV No. 67/1998 Coll.),
- Vienna Convention on Civil Liability for Nuclear Damage (in Vienna on May 21, 1963, ratified, communication of the MZV No. 133/1994 Coll.),
- The Joint Protocol relating to the Application of the Vienna and Paris Conventions on Liability for Nuclear Damage (in Vienna in 1988, ratified, communication of the MZV No. 133/1994 Coll.),
- The Protocol on Amendment to the Vienna Convention on Civil Liability for Nuclear Damage (in Vienna on September 12, 1997, signed by the Czech Republic on June 18, 1998, however, has not been ratified as yet). By virtue of Act No. 158/2009 Coll., the Czech Republic adapted the amount of liability of the operators and state guarantees to this protocol,
- The Comprehensive Nuclear Test Ban Treaty (has not become valid as yet, the Czech Republic's Government Order No. 535/1996),
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radiological Waste Management (in Vienna on September 5, 1997, UV No. 593/1997, ratified on March 26, 1999),
- The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) (Decree by the MZV No. 61/1974 Coll., of March 29, 1974),
- The Convention on Supplementary Compensation for Nuclear Damage (in Vienna on September 12, 1997, the Government Order No. 97/1998, signed by the Czech Republic, however, has not been ratified),
- The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, February 25, 1991, ratified on February 26, 1991, Decree by the MZV No. 91/2001 Coll.),
- The Convention on Korean Energetics Development Organization (KEDO) – letter of the MZV on acceptance of the Agreement of March 9, 1995 and of the supplemental Protocol of 1997 by the Czech Republic dated January 27, 1999; the Czech Republic became a member on February 9, 1999,
- The Agreement between the Czech Republic and the International Atomic Energy Agency on Safeguards, based on the Treaty on Non-proliferation of Nuclear Weapons (in Vienna on September 18, 1996, through communication of the MZV No. 68/1998 Coll.),

- The Supplemental Protocol to the Agreement between the Czech Republic and the International Atomic Energy Agency on Safeguards, based on the Treaty on Non-proliferation of Nuclear Weapons (in Vienna on September 28, 1999, through communication of the MZV No. 74/2003 Coll.),
- Adapted supplemental Agreement on Technical Assistance provided by the International Atomic Energy Agency to Government of the Czech and Slovak Federal Republic (in Vienna on September 20, 1990, No. 509/1990 Coll.).

#### **13.1.4 Legislative acts regulating activities relating to nuclear safety and radiation protection**

- Act No. 106/1999 Coll., on free access to information, as amended,
- Act No. 123/1998 Coll., on the right to information on environment, as amended,
- Act No. 594/2004 Coll., implementing the regime of the European Communities to control the export of dual use goods and technologies, as amended,
- Act No. 100/2001 Coll., on environmental impact assessment, as amended,
- Act No. 111/1994 Coll., on road traffic, as amended,
- Act No. 255/2012 Coll., on Inspection (Inspection Code), as amended,
- Act No. 183/2006 Coll., on Spatial Planning and Building Rules, as amended,
- Act No. 500/2004 Coll., on administrative procedure, as amended,
- Act No. 412/2005 Coll., on classified information protection and on security competence, as amended,
- Act No. 505/1990 Coll., on Metrology, as amended.

#### **13.1.5 Emergency Legislation acts**

- Constitutional Act No. 110/1998 Coll., on Security of the Czech Republic, as amended,
- Act No. 239/2000 Coll., on Integrated Rescue System and on Amendment to Certain Related Acts, as amended,
- Act No. 240/2000 Coll., on Crisis Management and on Amendment to Certain Related Acts, as amended,
- Act No. 241/2000 Coll., on Economic Measures for Crisis Situations and on Amendment to Certain Related Acts, as amended,
- Act No. 133/1985 Coll., on Fire Protection, as amended,
- Government Regulation No. 462/2000 Coll., on Implementation of Some Provisions of the Crisis Act, as amended,
- Government Regulation No. 463/2000 Coll., on Setting the Rules for Participation in International Rescue Operations, Granting and Receiving Humanitarian Aid, and Reimbursement of Expenses Incurred by Legal Persons and Natural Persons Pursuing Business Activities for Protection of Inhabitants, as amended,
- Government Regulation No. 465/2008 Coll., on Calling in the Troops of the Armed Forces of the Czech Republic to Fulfil the Tasks of the Police of the Czech Republic in Radiation Accidents at Nuclear Power Plants,
- Government Regulation No. 431/2010 Coll. amending Government Regulation No. 462/2000 Coll. to implement § 27 paragraph 8 and § 28 paragraph 5 of Act No. 240/2000 Coll., on crisis management and amending certain acts (Crisis Act), as amended,
- Government Regulation No. 432/2010 Coll., on Criteria for Defining Critical Infrastructure Elements,
- Decree No. 328/2001 Coll., on Some Details of the Security of the Integrated Rescue System, as amended,
- Decree No. 247/2001 Coll., on the Organization and Operation of Fire Protection, as amended,

- Decree No. 380/2002 Coll., on the Preparation and Fulfilment of Tasks to Protect the Population.



## 14 ANNEX 2 References

- [1] The Czech Republic National Report under the Convention on Nuclear Safety, SÚJB, 2013.
- [2] National Report of the Czech Republic under the Joint Convention on Safety in SF Management and Safety in RAW Management, SÚJB, 2011.
- [3] National Report of the Czech Republic on Emergency Preparedness and response, SÚJB, 2014.
- [4] The Czech Republic Extraordinary National Report under the Convention on Nuclear Safety, SÚJB, 2012.
- [5] Integrated Regulatory Review Service (IRRS) mission to the Czech Republic, IAEA, November 2013.
- [6] National Report on “Stress tests” NPP Dukovany and NPP Temelín, Czech Republic, Evaluation of Safety and Safety Margins in the light of the accident of the NPP Fukushima, Rev. 1, March 2012.

References [1], [2], [3] and [4] are available at SÚJB web pages: <http://www.sujb.cz/en/reports/>

[5] is available at the SÚJB web page:

[http://www.sujb.cz/fileadmin/sujb/docs/zpravy/IRRS\\_Czech\\_Republic\\_Final\\_Report.pdf](http://www.sujb.cz/fileadmin/sujb/docs/zpravy/IRRS_Czech_Republic_Final_Report.pdf)

[6] is available at SÚJB web page:

[https://www.sujb.cz/fileadmin/sujb/docs/dokumenty/National\\_Report\\_Revision\\_1\\_for\\_web\\_1.pdf](https://www.sujb.cz/fileadmin/sujb/docs/dokumenty/National_Report_Revision_1_for_web_1.pdf)