



**INTEGRATED
REGULATORY
REVIEW SERVICE (IRRS)
MISSION
TO THE
CZECH REPUBLIC**

Prague, Czech Republic

18-29 November 2013

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY



SÚJB

State Office for Nuclear Safety



INTEGRATED REGULATORY REVIEW SERVICE (IRRS)
REPORT TO THE
CZECH REPUBLIC





INTEGRATED REGULATORY REVIEW SERVICE (IRRS) REPORT TO THE CZECH REPUBLIC

Mission date: 18 to 29 November 2013
Regulatory body: SÚJB - State Office for Nuclear Safety
Location: Senovážné náměstí 9, 110 00 Prague 1, Czech Republic
Regulated facilities and activities: NPPs, spent fuel cycle facilities, waste management facilities, uranium mine, radiation sources in industrial and medical facilities, emergency preparedness and response, transport and decommissioning
Organized by: International Atomic Energy Agency (IAEA)

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IAEA-2014

The number of recommendations, suggestions and good practices is in no way a measure of the status of the regulatory body. Comparisons of such numbers between IRRS reports from different countries should not be attempted.

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EXECUTIVE SUMMARY

At the request of the Government of the Czech Republic, an international team of senior safety experts met representatives of State Office for Nuclear Safety (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 review compared the Czech regulatory framework for safety against IAEA safety standards as the international benchmark for safety. The mission was also used to exchange information and experience between the IRRS review team members and the Czech counterparts in the areas covered by the IRRS.

The IRRS review team consisted of 19 senior regulatory experts from 18 IAEA Member States, 1 observer from the European Commission, 5 IAEA staff members and 1 IAEA administrative assistant. The IRRS review team carried out the review in the following areas: responsibilities and functions of the government; the global nuclear safety regime; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body including the authorization, review and assessment, inspection and enforcement processes; development and content of regulations and guides; emergency preparedness and response; occupational radiation protection, patient protection, public and environmental exposure control, transport, waste management and decommissioning and fuel cycle facilities, as well as lessons learned from the TEPCO-Fukushima Dai-ichi accident.

In addition, policy issues were discussed, including: Governance issues, related to the establishment of a Commission and Transparency.

The IRRS review addressed all facilities and activities regulated by SÚJB.

The mission included observations of regulatory activities and interviews and discussions with SÚJB staff, representatives from the Ministry of Industry and Trade, representatives of the Chair-Advisory Bodies, the Ministry of Health, the General Directorate of Fire Rescue Services and other organizations to help assess the effectiveness of the regulatory system. Visits were also performed to: Dukovany nuclear power plant, Dekra Industrial Facility at Hradec Kralove, Radiotherapy Department of Faculty Hospital Motol, Interventional Cardiology of IKEM Hospital, Uranium Mining and Milling facility GEAM at Dolní Rožínka. The IRRS team members observed the working practices during inspections carried out by SÚJB, including discussions with the licensee personnel and management. In addition, the IRRS team observed an emergency exercise at SÚJB headquarters which involved Dukovany nuclear power plant and SÚJB crisis staff.

SÚJB provided the IRRS review team with advance reference material and documentation including the results of the self-assessment in all areas within the scope of the mission. Throughout the mission, the IRRS review team was extended full cooperation in regulatory, technical, and policy issues by all parties; in particular, the staff of SÚJB provided the fullest practicable assistance and demonstrated extensive openness and transparency.

The IRRS review team identified a number of good practices and made recommendations and suggestions where improvements will 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 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;
- SÚJB is an effective and independent regulatory body;
- the Czech Republic actively participates in the global safety regime;
- SÚJB benefits from experienced, technically competent and well-motivated staff.

The possible implications of the TEPCO Fukushima Dai-ichi accident on nuclear and radiation safety in the Czech Republic were thoroughly assessed and the actions that may further enhance the nuclear and radiation safety in the country, including the results of the stress tests, were identified and scheduled for realization in an Action Plan.

The IRRS team believes that SÚJB faces challenges over the next several years, which include:

- Updating Czech legislative and regulatory framework and developing new regulations and guides;
- Further development and implementation of its Integrated Management System; and
- Development of a long term strategy for human resources, including knowledge management.

The IRRS review team identified a number of good practices and made recommendations and suggestions that indicate where improvements are necessary or desirable to continue enhancing the effectiveness of regulatory functions in line with the IAEA Safety Standards.

Among the good practices identified by the IRRS review team are the following:

- SÚJB has a high degree of independence in reporting directly to the Cabinet as well as for drafting new legislation for Government and the ability to establish regulations
- Nuclear and radiological emergency preparedness and response is well integrated in the national crisis management infrastructure
- SÚJB has made an arrangement through which the financial status of all licensees of radiation sources is regularly checked to ensure licensee's obligations over the sources are maintained.
- SÚJB has an effective methodology for the assessment of licensee performance and overall regulatory programme feedback including the assessment of nuclear power plant operator's safety culture

The IRRS review team identified certain issues warranting attention or in need of improvement and believes that consideration of these would enhance the overall performance of the regulatory system:

- Establishment of a national policy and strategy for safety by the Government to ensure that the Safety Fundamentals are explicitly adopted in a high level document
- Establishment of a top-down approach for issuing regulatory requirements and guides for allowing SÚJB to develop regulatory requirements for all areas of nuclear safety for nuclear facilities.
- Further development and implementation of SÚJB Integrated Management System with regard to process implementation, promotion of safety culture, and measurement, assessment and improvement.
- Establishment of requirements for emergency action levels in the regulatory framework and further revision of the Czech legislation to ensure threat categorization, national emergency plans and recovery actions will be in line with GS-R-2 requirements.

- Review and revision of decrees covering the design requirements for nuclear installations and development of associated guides.
- Revision of the legislative and regulatory framework for radiation safety to align with the requirements of GSR Part 3.

The IRRS review team findings are summarized in Appendices V and VI.

An IAEA press release was issued at the end of the IRRS mission.

I. INTRODUCTION

At the request of the Government of Czech Republic, an international team of senior safety experts met representatives of State Office for Nuclear Safety (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. The review mission was formally requested by the Government of Czech Republic in January 2012. A preparatory mission was conducted from 29 to 30 April 2013 at SÚJB Headquarters in Prague to discuss the purpose, objectives, scope and detailed preparations of the review in connection with the facilities regulated by SÚJB and selected safety aspects.

The IRRS review team consisted of 19 senior regulatory experts from 18 IAEA Member States, 1 observer from the European Commission, 5 IAEA staff members and 1 IAEA administrative assistant. The IRRS review team carried out the review in the following areas: responsibilities and functions of the government; the global nuclear safety regime; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body including the authorization, review and assessment, inspection and enforcement processes; development and content of regulations and guides; emergency preparedness and response; occupational radiation protection, patient protection, public and environmental exposure control, transport, waste management and decommissioning and fuel cycle facilities. As recommended by the IAEA Nuclear Safety Action Plan, special attention was given to regulatory implications in the Czech framework for safety of the TEPCO-Fukushima Dai-ichi accident.

In addition, policy issues were discussed, including: Governance issues, related to the establishment of a Commission and Transparency.

The IRRS review addressed all facilities and activities regulated by SÚJB.

SÚJB conducted a self-assessment in preparation for the mission and prepared a preliminary action plan. The results of self-assessment and supporting documentation were provided to the team as advance reference material for the mission. During the mission the IRRS review team performed a systematic review of all topics by reviewing the advance reference material, conducting interviews with SÚJB management and staff and performed direct observation of SÚJB working practices during inspections. Visits were performed to: Dukovany nuclear power plant, Dekra Industrial Facility at Hradec Kralove, Radiotherapy Department of Faculty Hospital Motol, Interventional Cardiology of IKEM Hospital, Uranium Mining and Milling facility GEAM at Dolní Rožínka. The IRRS team has also observed an emergency response exercise, which involved Dukovany nuclear power plant and the SÚJB crisis staff. Meetings with the Ministry of Industry and Trade, representatives of the Chair-Advisory Bodies, and Ministry of Health were also organized.

All through the mission the IRRS team received excellent support and cooperation from SÚJB.

II. OBJECTIVE AND SCOPE

The purpose of this IRRS mission was to conduct a review of the Czech Republic radiation and nuclear safety regulatory framework and activities to review its effectiveness and to exchange information and experience in the areas covered by the IRRS. The IRRS review scope included all facilities regulated by SÚJB. The review was carried out by comparison of existing arrangements against the IAEA safety standards.

It is expected that the IRRS mission will facilitate regulatory improvements in Czech Republic and other Member States from the knowledge gained and experiences shared by SÚJB and IRRS reviewers and through the evaluation of the effectiveness of the Czech Republic regulatory framework for nuclear safety and its good practices.

The key objectives of this mission were to enhance nuclear and radiation safety, emergency preparedness and response:

- Providing Czech Republic and SÚJB, through completion of the IRRS questionnaire, with an opportunity for self-assessment of its activities against IAEA safety standards;
- Providing Czech Republic and SÚJB with a review of its regulatory programme and policy issues relating to nuclear and radiation safety, and emergency preparedness;
- Providing Czech Republic and SÚJB with an objective evaluation of its nuclear safety, and emergency preparedness and response regulatory activities with respect to IAEA safety standards;
- Contributing to the harmonization of regulatory approaches among IAEA Member States;
- Promoting the sharing of experience and exchange of lessons learned;
- Providing reviewers from IAEA Member States and the IAEA staff with opportunities to broaden their experience and knowledge of their own fields;
- Providing key SÚJB staff with an opportunity to discuss their practices with reviewers who have experience with different practices in the same field;
- Providing Czech Republic and SÚJB with recommendations and suggestions for improvement; and
- Providing other States with information regarding good practices identified in the course of the review.

III. BASIS FOR THE REVIEW

A) PREPARATORY WORK AND IAEA REVIEW TEAM

At the request of the Government of Czech Republic, a preparatory meeting for the Integrated Regulatory Review Service (IRRS) was conducted from 29 to 30 April 2013. The preparatory meeting was carried out by the appointed Team Leader Mr Derek Lacey, Deputy Team Leader Mr Peter Johnston, and the IRRS IAEA Team representatives, Ms Adriana Nicic, Team Coordinator, Mr Ibrahim Sadat, Deputy Team coordinator and Mr Rodrigo Salinas, EPR review facilitator.

The IRRS mission preparatory team had discussions regarding regulatory programmes and policy issues with the senior management of SÚJB represented by Ms Dana Drabova, SÚJB Chairperson, other senior management and staff. The discussions resulted in agreement that the regulatory functions covering the following facilities and activities were to be reviewed by the IRRS mission:

- Nuclear power plants;
- Fuel cycle facilities;
- Waste facilities;
- Radiation sources facilities;
- Decommissioning;
- Transport;
- Emergency preparedness and response;
- Patient protection;
- Occupational radiation protection;
- Public and Environmental exposure control;
- Waste management (policy and strategy, predisposal and disposal);
- Regulatory implications of the TEPCO Fukushima Dai-ichi accident; and
- Selected policy issues.

SÚJB managers made presentations on the national context, the current status of SÚJB and the self-assessment results to date.

IAEA staff presented the IRRS principles, process and methodology. This was followed by a discussion on the tentative work plan for the implementation of the IRRS in Czech Republic in November 2013.

The proposed IRRS Review team composition (senior regulators from Member States to be involved in the review) was discussed and the size of the IRRS Review team was tentatively confirmed. Logistics including meeting and work space, counterparts and Liaison Officer identification, proposed site visits, lodging and transportation arrangements were also addressed.

The SÚJB Liaison Officer for the preparatory meeting and the IRRS mission was Mr Milos Tichy.

SÚJB provided IAEA (and the review team) with the advance reference material for the review at the end of August 2013, including the self-assessment results. In preparation for the mission, the IAEA review team members conducted a review of the advance reference material and provided their initial review comments to the IAEA Team Coordinator prior to the commencement of the IRRS mission.

B) REFERENCE FOR THE REVIEW

The most relevant IAEA safety standards and the Code of Conduct on the Safety and Security of Radioactive Sources were used as review criteria. A more complete list of IAEA publications used as the reference for this mission is given in Appendix VIII.

C) CONDUCT OF THE REVIEW

An opening IRRS Review team meeting was conducted on Sunday, 17 November 2013 in Prague by the IRRS Team Leader, IRRS Team Coordinator and IRRS Deputy Team Coordinator to discuss the general overview, the focus areas and specific issues of the mission, to clarify the basis for the review and the background, context and objectives of the IRRS and to agree on the methodology for the review and the evaluation among all reviewers. They also presented the agenda for the mission.

In addition, the IAEA Team Coordinator presented the expectations regarding the module on the “Regulatory implications from TEPCO-Fukushima Dai-ichi Accident”.

The Liaison Officer was present at the opening IRRS Review team meeting, in accordance with the IRRS guidelines, and presented logistical arrangements planned for the mission.

The reviewers also reported their first impressions of the advance reference material.

The IRRS entrance meeting was held on Monday, 18 November 2013, with the participation of SÚJB senior management and staff. Opening remarks were made by Ms Dana Drabova, SÚJB Chairperson, Mr Derek Lacey, IRRS Team Leader and Ms Adriana Nicic, IRRS Team Coordinator. Ms Drabova gave an overview of the Czech Republic context, SÚJB activities and the action plan prepared as a result of the self-assessment.

During the mission, a review was conducted for all the review areas with the objective of providing Czech Republic and SÚJB with recommendations and suggestions for improvement as well as identifying good practices. The review was conducted through meetings, interviews and discussions, visits to facilities and direct observations regarding the national practices and activities.

The IRRS Review team performed its activities based on the mission programme given in Appendix II.

The IRRS exit meeting was held on Friday, 29 November 2013. The opening remarks at the exit meeting were presented by Ms Dana Drabova, and were followed by the presentation of the results of the mission by the IRRS Team Leader Mr Derek Lacey. Closing remarks were made by Mr Jim Lyons, IAEA, Director, Division of Nuclear Installation Safety.

An IAEA press release was issued at the end of the IRRS mission.

1. RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT

1.1. NATIONAL POLICY AND STRATEGY FOR SAFETY

The Czech Republic has a well-established legislative and regulative framework for the use of nuclear power and for the protection of people and the environment from the harmful effects of ionising radiation. The strategy and policies for safety derives from the Act on Peaceful Utilisation of Nuclear Energy and Ionising Radiation (the Atomic Act) as amended. The scope of the Act covers “

- a) the method of utilising nuclear energy and ionising radiation, and conditions for the performance of practices related to nuclear energy utilisation and radiation activities;
- b) the system for protection of people and the environment from undesirable effects of ionising radiation;
- c) obligations during preparation for and implementation of intervention intended to reduce exposures to natural sources and exposures due to radiation accidents;
- d) specific requirements for civil liability in the case of nuclear damage;
- e) conditions for safe management of radioactive waste;
- f) performance of State administration and supervision within nuclear energy utilisation, within radiation activities and over nuclear items.”

The IRRS team has concluded that the Atomic Act provides for a graded approach. The Atomic Act incorporates the safety objective and most of the safety principles established in the IAEA Safety Fundamentals.

The IRRS team concludes that the explicit expression of the principle of prime responsibility for safety is included in the Atomic Act for nuclear safety of a nuclear installation. For other authorized activities the responsibility is not well expressed in the Atomic Act, but the legal intent is clear and a general responsibility derives from the legal conventions of the Czech Republic. The current Atomic Act states that “the licensees ensure nuclear safety, [where] the responsibility for nuclear safety of a nuclear installation cannot be delegated to another person, radiation protection, physical protection and emergency preparedness, including its verification, in the scope appropriate to the particular licences”. The objective of this provision of the Atomic Act is not grammatically precise although the intent in law is clear and the IRRS team was told that it would be rephrased in revision of the Atomic Act.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: The Safety Fundamentals are not fully implemented in the Czech legislative framework. The principle of leadership for safety and the involvement of the highest level of management in safety are not explicitly stated in the Atomic Act. The principle of protection of present and future generations does not explicitly address harm to future generations. |
| (1) | BASIS: GSR Part 1 Req. 1 states that <i>“The Government shall provide a national policy and strategy for safety, the implementation of which shall be subject to a graded approach in accordance with national circumstances and with the radiation risks associated with facilities and activities, to achieve the fundamental safety objective and to apply the fundamental safety principles established in the Safety Fundamentals.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | BASIS: GSR Part 1 Req. 5 states that <i>“The government shall expressly assign the prime responsibility for safety to the person or organization responsible for a facility or an activity, and shall confer on the regulatory body the authority to require such persons or organizations to comply with stipulated regulatory requirements, as well as to demonstrate such compliance.”</i> |
| R1 | Recommendation: The Government should establish a national policy and strategy for safety to ensure that the Safety Fundamentals are explicitly adopted in a high level document. |

1.2. ESTABLISHMENT OF A FRAMEWORK FOR SAFETY

The Atomic Act provides a comprehensive framework for nuclear and radiation safety. It assigns SÚJB as the central administrative body to carry out State regulation of nuclear safety, physical protection, radiation protection, emergency preparedness, to issue authorisations, to determine competencies and to regulate other matters relating to nuclear and radiation safety.

The Atomic Act details the extent to which the national framework for safety specifies responsibilities and obligations including financial provisions for the management of radioactive waste and spent fuel, for decommissioning of facilities and termination of activities.

1.3. ESTABLISHMENT OF A REGULATORY BODY AND ITS INDEPENDENCE

The Atomic Act assigns SÚJB to be the central administrative body having full regulatory control of nuclear and radiation safety in the Czech Republic. SÚJB is enabled to make regulations. SÚJB has a well-defined role in drafting new legislation for Government consideration.

The Government has provided the regulatory body with the competences and resources necessary for fulfilling its statutory obligation for regulatory control of facilities and activities. The IRRS team was informed by SÚJB that in its opinion it currently has sufficient numbers of qualified staff and sufficient financial resources for the proper discharge of its assigned responsibilities. The IRRS team accepts SÚJB’s conclusion that it currently has a sufficient number of staff, but the IRRS team understands that in certain areas there will be insufficient staff in the future without active management. SÚJB relies on the competence of external technical support organisations (TSOs) and there is a continuing challenge to maintain competence (see chapters 3 and 6).

SÚJB is the independent state body with the ability to make final regulatory decisions which can only be challenged in a court. The Chair is appointed by the Cabinet. SÚJB is funded by appropriations and licence fees. The decision making process is independent of other bodies, however some processes require prior approvals by other ministries, e.g. environmental impact assessments must be approved by the Ministry of Environment prior to decision making for a siting licence for a nuclear installation.

SÚJB is a comprehensive regulator of nuclear and radiation safety, physical protection, safeguards, emergency preparedness and response. This organisational structure focuses on regulatory matters and thus minimises the opportunity for conflict of interest.

The IRRS Team has concluded that the requirement for independence of the regulatory body for decision making is met and SÚJB is free from conflicting responsibilities.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: The chair is appointed by the Government. SÚJB reports directly to the Prime Minister through the Cabinet Office. SÚJB has well defined responsibilities and is able to draft new legislation for Government consideration. |
| (1) | BASIS: GSR Part 1 Req. 4 states that <i>“The Government shall ensure that the regulatory body is effectively independent in its safety related decision making and that it has functional separation from entities having responsibilities or interests that could unduly influence its decision making.”</i> |
| GP1 | Good Practice: SÚJB reports directly to the Cabinet and is able to draft new legislation for Government consideration and the ability to establish regulations with legal effect, which gives it a high degree of independence. |

1.4. COMPLIANCE WITH REGULATIONS AND RESPONSIBILITY FOR SAFETY

The principle of prime responsibility for safety is included in the Atomic Act, however some rephrasing of the provision would be helpful (as detailed in section 1.1). Consistent with the IAEA Safety Fundamentals and the European Directive on Nuclear Safety, the responsibility of authorized parties is enduring and cannot be delegated.

SÚJB has the authority under the Atomic Act to require demonstration of compliance with its regulations. The Atomic Act allows for the transfer of responsibility for radioactive waste by arrangements after approval by SÚJB. Under the terms of the Atomic Act, the State guarantees safe disposal of all radioactive waste, including monitoring and supervision of repositories after their closure.

1.5. COORDINATION OF AUTHORITIES WITH RESPONSIBILITIES FOR SAFETY WITHIN THE REGULATORY FRAMEWORK

SÚJB regulates nuclear and radiation safety, safeguards, physical protection, making it a comprehensive regulator of activities involving ionising radiation. Having all these regulatory functions integrated in the same entity reduces the number of interfaces with other organisations.

The Czech Government imposes strong boundaries on the responsibilities of its ministries and other government administrative bodies to ensure clarity of responsibility. The rules of administrative procedure between government administrative bodies are defined in the Czech legislative system. The interaction with other state administrative bodies has a range of approaches;

- In the case of crisis management there is specific legislation, in particular the Atomic Act includes within its scope “c) obligations during preparation for and implementation of intervention intended to reduce exposures to natural sources and exposures due to radiation accidents”.
- The interaction of SÚJB with other ministries, administrative bodies and organisations are, sometimes, formalized by special arrangements, for example the arrangement for SÚJB to run the national monitoring network. In the area of NPP authorisation the interaction can be improved, see Chapter 5.2.

The IRRS Team was shown evidence of collaboration arrangements with the Ministry of Health, Committee of Public Health and the Ministry of Agriculture.

Regarding transport of radioactive material, liaison and cooperation with other state administrative bodies such as customs, have been established to achieve assurance of compliance with the transport regulations

and import and export controls. Collaboration with the police is also undertaken with respect to physical protection, escorts and traffic control for the shipment of nuclear material. There is good cooperation between state administrative bodies and counterparts with respect to the transport of radioactive material.

Regarding exchange of information and coordination with other state administrative bodies, SÚJB:

- 1) asks packaging manufacturers, consignors, carriers, consignees and other stakeholders for comments on the new legal regulations drafts,
- 2) communicates with the stakeholders about changes of the regulations for the transport of radioactive material by generic letters,
- 3) arranges “ad hoc” meetings with other state administrative bodies, other agencies and persons in order to ensure an exchange of information regarding changes of the regulations for the transport of radioactive material.

There are provisions in the Atomic Act for cooperation between States and their respective administrative bodies when States are affected by transport accidents. The cooperation between States in the event of a transport accident is achieved through bilateral agreements with neighbouring States and through international conventions.

1.6 SYSTEM FOR PROTECTIVE ACTIONS TO REDUCE UNREGULATED RADIATION RISKS

The State has established a Radioactive Waste Repository Authority (SÚRAO) to manage radioactive waste disposal in the Czech Republic. The Atomic Act stipulates that the State provides financial resources for the disposal of radioactive waste and for the elimination of radioactive environmental contamination which arose prior to privatisation of the waste generators. As provided for by the Atomic Act the State subsidises action to mitigate “old radiation burdens”, e.g. for the identification of risks arising from the presence of indoor radon, and taking intervention measures, and the mitigation of high Radon levels in homes.

The state enterprise DIAMO is charged with the administration of “old radiation burdens” arising from the uranium mining and milling; it is obliged to observe the principles of justification and optimization during the redevelopment and liquidation.

If an orphan source (or something which is suspected to be an orphan source) is found, it should be reported without delay to the Police or the SÚJB. The regulator has the responsibility to decide on the safe handling of the source. In each region, there is a designated organisation which is licensed to handle such sources and to deliver it to SÚRAO. If the responsible party for the source (e.g. licensee who has lost the source) cannot be identified, the cost of the seizure and waste management is assumed by the State through the SÚRAO.

SÚJB has prepared and distributed practical guidance for the use by organisations that may handle orphan sources, including the police, fire brigades and scrap metal companies. There are no legal requirements for monitoring scrap metal for radioactivity, but most major companies collecting scrap metal or delivering it to the smelters, as well as the smelters, have systems in place for detecting radioactive contamination, e.g. gate monitors or hand held survey meters.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: The Atomic Act stipulates that SÚRAO ensures provision of temporary administration in the case of radioactive waste that has become State property; if these items are found, left or hidden, the Authority is required also to accept them. The state enterprise DIAMO was charged with the administration of old radiation burdens, e.g. legacy Uranium mines and tailing facilities. The Establishment of the SÚRAO and DIAMO provide a comprehensive means of dealing with unregulated radiation risks. In addition, the State operates a programme to mitigate high levels of Radon in domestic dwellings, schools and kindergarten.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 9 states that <i>“The government shall establish an effective system for protective actions to reduce undue radiation risks associated with unregulated sources (of natural or artificial origin) and contamination from past activities or events, consistent with the principles of justification and optimization.”</i></p> |
| GP2 | <p>Good Practice: Creation of a comprehensive State strategy to deal with unregulated radiation risks.</p> |
| | <p>Observation: Despite of several legal provisions for disposal of radioactive waste and well established practical arrangements for the safe management of orphan sources, the Government has not established overall policies or strategies for gaining control of orphan sources.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 9 states that <i>“The government shall establish an effective system for protective actions to reduce undue radiation risks associated with unregulated sources (of natural or artificial origin) and contamination from past activities or events, consistent with the principles of justification and optimization.”</i></p> |
| (2) | <p>BASIS: CoC on the Safety and Security of Radioactive Sources. Para. 8 (c) states that <i>“Every State should have in place an effective national legislative and regulatory system of control over the management and protection of radioactive sources. Such a system should include national strategies for gaining or regaining control over orphan sources.”</i></p> |
| S1 | <p>Suggestion: The Government should consider establishing a national strategy for gaining or regaining control over orphan sources.</p> |

1.7. PROVISIONS FOR DECOMMISSIONING AND MANAGEMENT OF RADIOACTIVE WASTE AND SPENT FUEL

The governmental policy and strategy on waste and spent fuel management and decommissioning, including final disposal, is defined by the “Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic (May 2002)”. The Concept defines end states and a time line to approximately 2025, with an outlook to the end of the 21st century.

SÚRAO is established within the Ministry of Industry and Trade to manage the disposal of radioactive waste. Predisposal management is the responsibility of the operator. SÚRAO is responsible for research and development to achieve the end states defined in the Concept. SÚJB, in cooperation with the Ministry of Industry and Trade and SÚRAO, initiated a process of updating the Concept. A new version of the Concept has been prepared by SÚRAO in 2013 and was submitted to the Ministry of Industry and Trade for review.

The Atomic Act provides for the regulation of decommissioning and the provision of adequate financial resources to accomplish decommissioning. The Atomic Act further provides for the regulation of spent

fuel and radioactive waste management. Spent fuel is the responsibility of the operator. The Government has made provisions for operators to fund disposal of radioactive waste through the “nuclear account”. The resources in the nuclear account may only be used for defined purposes.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The document “Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic” (Government Resolution No. 487/2002), is a fundamental document which defines the RAW and SF management strategies of the Government. This document is over 10 years old and contains commitments with completion dates occurring in the past. |
| (1) | BASIS: SSR 5 Req. 1 states that <i>“The government is required to establish and maintain an appropriate governmental, legal and regulatory framework for safety within which responsibilities shall be clearly allocated for disposal facilities for radioactive waste to be sited, designed, constructed, operated and closed. This shall include: confirmation at a national level of the need for disposal facilities of different types; specification of the steps in development and licensing of facilities of different types; and clear allocation of responsibilities, securing of financial and other resources, and provision of independent regulatory functions relating to a planned disposal facility.”</i> |
| (2) | BASIS: GSR Part 5 states that <i>“to ensure the effective management and control of radioactive waste, the government shall ensure that a national policy and a strategy for radioactive waste management are established. The policy and strategy shall be appropriate for the nature and the amount of the radioactive waste in the State and shall indicate the regulatory control required, and shall consider relevant societal factors. The policy and strategy shall be compatible with the fundamental safety principles [2] and with international instruments, conventions and codes that have been ratified by the State. The national policy and strategy shall form the basis for decision making with respect to the management of radioactive waste.”</i> |
| S2 | Suggestion: The Government should consider adopting a process for periodic review of the document “Concept of Radioactive Waste and Spent Nuclear Fuel Management”. |

1.8. COMPETENCE FOR SAFETY

SÚJB requires individual training plans for its staff. . Some parts of the training are contracted to outside organisations and universities. . It works with the universities to assist them in delivering proper training. They also work with the Scientific Centre in Řež. SÚJB works with bilateral partners, e.g. the U.S. NRC to broaden training. The IRRS team concludes that a more detailed human capital development plan would strengthen the long-term regulatory competence of SÚJB (detailed in section 3.3)

Licensees are required to provide a system of training and verification of competence of personnel in accordance with the importance of the work they perform. The Atomic Act provides a framework for the issue of a licence for expert training of selected personnel, which requires regulatory approval.

SÚJB is structured to fulfil its regulatory functions as stated in the Atomic Act. Research and development is supported primarily by National Research Institutes (detailed in section 1.9) which are licensees. In addition, SÚJB uses universities, through adjunct arrangements, to enhance the competence of its staff.

1.9. PROVISION OF TECHNICAL SERVICES

Technical services essential for nuclear and radiation safety are available in the Czech Republic. Personal dosimetry is provided commercially. Environmental monitoring is undertaken by National Research Institutes and universities. The calibration of equipment is provided by the Czech Office for Standards, Metrology and Testing.

SÚJB is constituted as a regulatory authority that does not provide technical services. SÚJB relies on a range of TSOs including: the State Institute for Radiation Protection (SÚRO), the National Institute for Nuclear, Chemical and Biological Protection (SUJCHBO) and the Research Centre Řež. SÚJB provides a substantial part of the budgets for SÚRO and SUJCHBO, but does not exercise direct control. SÚJB uses the Research Centre Řež for technical support in nuclear safety amongst other providers. The Centre is owned by an operator, necessitating active management of possible conflict of interest (detailed in section 5.3).

1.10. SUMMARY

Technical services essential for nuclear and radiation safety are available in the Czech Republic. Personal dosimetry is provided commercially. Environmental monitoring is undertaken by National Research Institutes and universities. The calibration of equipment is provided by the Czech Office for Standards, Metrology and Testing.

SÚJB is constituted as a regulatory authority that does not provide technical services. SÚJB relies on a range of TSOs including: the State Institute for Radiation Protection (SÚRO), the National Institute for Nuclear, Chemical and Biological Protection (SUJCHBO) and the Research Centre Řež. SÚJB provides a substantial part of the budgets for SÚRO and SUJCHBO, but does not exercise direct control. SÚJB uses the Research Centre Řež for technical support in nuclear safety amongst other providers. The Centre is owned by an operator, necessitating active management of possible conflict of interest (detailed in section 5.3).

2. GLOBAL NUCLEAR SAFETY REGIME

2.1. INTERNATIONAL OBLIGATIONS AND ARRANGEMENTS FOR INTERNATIONAL COOPERATION

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 ionising radiation for peaceful purposes, and that provide for an effective coordinated international response to a nuclear or radiological emergency.

The Atomic Act gives authority to SÚJB to undertake international cooperation within its sphere of competence and it is responsible for technical cooperation with the IAEA. Within its sphere of competence, SÚJB communicates with the EC or, if applicable, with other bodies of the EU and ensures implementation of other obligations arising out of the EU legislation related to nuclear and radiation safety.

The “in house” policy of SÚJB is to use IAEA Safety Standards. The objective is to implement as much of the system of IAEA Safety Standards as possible, firstly through the imposition of licence conditions and subsequently through legislative amendment as part of the cycle of legislative renewal in the Czech Republic. There is no periodic evaluation of the legislation to determine if it is in line with the IAEA Safety Standards. It typically takes several years before IAEA Safety Standards are implemented in legislation. Not all the Safety Standards are implemented, e.g. the Czech legislative framework is yet to be aligned with GSR Part 3 (See modules 9 and 11). The IRRS team was informed that SÚJB’s objective, in drafting new legislation, was that the revised act will be fully aligned with the IAEA Safety Standards.

The Czech Republic has formally committed to the implementation of the Code of Conduct on the Safety and Security of Radioactive Sources by correspondence from the SÚJB to the IAEA. SÚJB is authorised under Czech law to enter into such international commitments.

The Czech Republic and SÚJB are very proactive in international cooperation. SÚJB staff has participated in the development of IAEA Safety Standards through participation in the IAEA Standards Committees including the Nuclear Safety Standards (NUSSC), Radiation Safety Standards Committee (RASSC), Transport Safety Standards Committee (TRANSSC) and Waste Safety Standards Committee (WASSC). The Chair of SÚJB is the current Chair of the IAEA Commission on Safety Standards (CSS).

SÚJB participates in a number of international organizations, working groups and committees important for enhancing harmonized approaches for safety as well as for exchange of regulatory and operating experience. These include: ICRP, OECD/NEA, ENSREG, WENRA, ENSRA, HERCA and EU committees.

A number of international peer reviews of both the regulatory system and of the safety of facilities have been carried out (e.g. IPPAS, IRRT, OSART, INSARR). SÚJB staff has participated in international peer reviews including IRRS or IRRT, OSART, IPPAS.

The Czech Republic participated in the European Stress Test initiative for the re-evaluation of the safety and safety margins of the nuclear power plants in the light of the Fukushima accident (detailed in Chapter 12.2).

There are bilateral international agreements at governmental level for cooperation on the safe use of nuclear energy, transportation of nuclear materials, for emergency preparedness and exchange of information including crisis information with Australia, Bulgaria, India, Canada, Korea, Hungary, Germany, Poland, Austria, Russian Federation, Slovakia, Ukraine and USA.

SÚJB has concluded bilateral arrangements with regulatory authorities for cooperation and exchange of information including safety regulation, operational experience and crisis information with other national regulatory bodies of e.g. Finland, France, Canada, Korea, Hungary, Germany, Romania, Russian Federation, Slovakia, Spain, Great Britain, Ukraine and USA. Regular consultations about safety of nuclear installations take place with Hungary, Germany, Poland, Austria, Slovakia and Slovenia. These international agreements are available on the SÚJB web site.

SÚJB informed the IRRS team that participating in a growing number of international organizations, working groups, committees and international peer reviews puts a significant additional workload on the staff.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: Not all the IAEA Safety Standards and requirements are implemented, e.g. the Czech legislative framework is yet to be aligned with GSR Part 3. The IRRS team was informed that new legislation is being drafted to be fully aligned with the IAEA Safety Standards. |
| (1) | BASIS: GSR Part 1 Req. 14 Para. 3.2 (c) states that <i>“The features of the global safety regime include international agreed IAEA safety standards that promote the development and application of international harmonizes safety requirements, guides and practices.”</i> |
| R2 | Recommendation: In drafting amendments to the national regulatory framework, SÚJB should fully take into account IAEA Safety Standards and requirements. |

2.2. SHARING OF OPERATING EXPERIENCE AND REGULATORY EXPERIENCE

According to the Atomic Act, the licensees are obliged to report to SÚJB events important to nuclear and radiation safety, physical protection, nuclear materials management or emergency preparedness. The Management System does not describe the process for evaluating international reported events and near-misses. National events are evaluated as part of the inspection programme (see chapter 6).

The sources used by 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 analyse the information from the different sources. The process of international events review and analysis is not formalised.

Information is also gathered directly through cooperation with regulators in countries having similar types of nuclear power plants, i.e. pressurized water reactors designed in the former Soviet Union. Pertinent or significant events are forwarded to relevant inspectors and experts of SÚJB, as well as to licensees.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The process for reviewing and evaluating international events and disseminating relevant information on lessons learned or the feedback on measures undertaken in response is not described. |
| (1) | BASIS: GSR Part 1 Req. 15 states that <i>“The regulatory body shall make arrangements for analysis to be carried out to identify lessons to be learned from operating experience and regulatory experience, including experience in other States, and for the dissemination of the lessons learned and for their use by authorized parties, the regulatory body and other relevant authorities.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

S3

Suggestion: SÚJB should consider the development and implementation of a process for systematic review and evaluation of international events and the dissemination of relevant information, lessons learned and feedback on the measures undertaken.

2.3. SUMMARY

The IRRS team concluded that the Czech Republic fulfils its international obligations and participates in the relevant international arrangements, including international peer reviews.

Not all the IAEA Safety Standards and requirements are implemented in legislation. Where SÚJB regards the matter as appropriate, new IAEA Safety Standards are made obligatory through licence conditions. SÚJB's objective is to implement as much of the system of IAEA Safety Standards as possible, firstly through the imposition of licence conditions and subsequently through legislative amendment as part of the cycle of legislative renewal in the Czech Republic. The IRRS team was informed that new legislation is being drafted to be fully aligned with the IAEA Safety Standards.

Although elements are in place for use and dissemination of both national and international operating and regulatory experience in order to contribute to safety, SÚJB should consider improving the process.

3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

3.1. ORGANIZATIONAL STRUCTURE OF THE REGULATORY BODY AND ALLOCATION OF RESOURCES

SÚJB receives its financial resources from the State Budget approved annually by the Parliament. State is recovering 60% of SÚJB budget from fees paid by the licence holders. This model of financing ensures that any State Budget decreases in resources allocated for state administration have a minimal effect on regulatory oversight. Based on the existing budget system SÚJB can plan and allocate its resources and undertake recruitment according to internally determined needs and in the areas of safety priority. SÚJB has informed the IRRS team that it has not experienced difficulties in planning and receiving from the State the financial resources that are needed to conduct its regulatory activity.

SÚJB's organisational structure was created with the focus on regulatory activities to accomplish duties and functions assigned in the legislation. The organization comprises units addressed to nuclear safety, radiation protection, management and technical support as well as emergency preparedness and response. The organization also comprises some centres located in the different regions and offices at the major nuclear installations.

Regulatory decisions are taken by SÚJB using the results of performed reviews and assessments as well as inspection activities. Inspectors are entitled to make decisions and impose specific corrective measures based on the evidence obtained during the inspections. A Committee for the periodic evaluation of inspection reports and to plan subsequent activities has been established. All major relevant administrative internal documents are signed by the SÚJB Chairperson. Other decisions and authorisations for the licensees are delegated to managers of different units according to their specific responsibility. SÚJB Chairman acts as first level of appeal.

3.2. EFFECTIVE INDEPENDENCE IN THE PERFORMANCE OF REGULATORY ACTIVITIES

SÚJB was established in 1993 as the central body of the Czech Republic's state administration for the supervision of nuclear safety and nuclear materials. In July 1995 the Czech Republic's Parliament extended SÚJB's competences to include the issue of radiation protection. SÚJB is now an integrated state administration body which carries out state supervision in the whole area of nuclear and radiation safety. As defined in its legislative basis, SÚJB is fully independent in its decision making process. SÚJB is entitled to prepare and to propose legislation, as well as to issue regulations, providing that the legislation is enabled in the Atomic Act, as well as guides.

Based on SÚJB independence, no particular conflicts of interest can be identified internally to the organization. In the case of staff recruited from authorized parties, the independence of SÚJB, regulatory aspects and safety considerations shall be emphasized in their training. Potential conflicts of interests associated with the use of external support organizations having a relationship with authorized parties are managed in through the definition process of the contracts (see point 3.4).

An ethical code which establishes key expectations for the integrity of inspectors and staff exists.

3.3. STAFFING AND COMPETENCE OF THE REGULATORY BODY

Most of the professional staff of SÚJB work on regulatory functions related to nuclear and radiation safety and a large fraction of the positions comprise nuclear safety and radiation protection inspectors. It has to be noted that the number of people in the nuclear safety section has increased over the past five years, primarily due to the planned construction of two new nuclear units. Some young engineers have been hired in the last five years and also some students are hired on temporary contracts. The IRRS team has however noted that a number of staff are approaching retirement and there are some areas, for example in relation to specific topics of review and assessment, waste and transport safety, with limited human resources, for which challenges may occur to perform regulatory functions. In relation to the licensing process for siting new NPPs, a systematic survey of the necessary resources has been performed (see chapter 5). Such a survey is also planned for other areas including NPPs licensing activities. Technical profiles of the staff performing the various relevant tasks are defined and kept updated.

Considering the large spectrum of SÚJB regulatory responsibilities existing efforts to maintain and further develop SÚJB competence should be strengthened with the development of a long term strategic plan to ensure the continued availability of the necessary qualified human resources.

Training programmes are established at organizational and individual level reflecting the tasks and responsibilities of the each individual member of the staff, according to specific job competence profiles.

In order to maintain or increase SÚJB employee qualification, an internal regulation based upon national regulations for maintaining and increasing qualifications of employees of state administrative bodies sets out the strategy for implementation of systematic education, preparation and periodic evaluation of work performance. On the job training is envisaged, in particular for new inspectors. It also includes an Individual Personal Development Plan (IPOR) which is agreed between the management and each SÚJB employee. In general, the training activities are based on the level of achieved education, length and level of practice and professional specialisation. The IRRS Team has noted that significant progress has been made by SÚJB in the area of education and training implementing a state of the art methodology. The implementation of the systematic approach to training can be further improved by introducing a process for feedback from trainees.

In addition to competence and resources of its own staff, SÚJB uses TSOs as well as other consultants to support regulatory activities, in particular for review and safety assessment purposes. The IRRS team has noted that core competences necessary to develop informed decisions on the basis of the advice provided by support organizations and information submitted by authorized parties and applicants are however not systematically and formally defined (see also chapter 6).

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | <p>Observation: Human and other resources are defined according to a short term plan of activity. Some new staff has been recently recruited. A number of SÚJB’s workforce is however nearing retirement. Some specific needs exist. A longer term strategy for human resource development is currently not in place in order to ensure the discharge of regulatory duties in the future.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 18 states that <i>“The regulatory body shall employ a sufficient number of qualified and competent staff, commensurate with the nature and the number of facilities and activities to be regulated, to perform its functions and to discharge its responsibilities.”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | <p>BASIS: GSR Part 1 Req. 18 Para. 4.11 states that <i>“The regulatory body has to have appropriately qualified and competent staff. A human resources plan shall be developed that states the number of staff necessary and the essential knowledge, skill and abilities for them to perform all the necessary regulatory functions.”</i></p> |
| (3) | <p>BASIS: GSR Part 1 Req. 18 Para. 4.12 states that <i>“The human resources plan for the regulatory body shall cover recruitment and, where relevant, rotation of staff in order to obtain staff with appropriate competence and skills, and shall include a strategy to compensate for departure of qualified staff.”</i></p> |
| R3 | <p>Recommendation: SÚJB should define a long term strategy for human resource development including corporate knowledge management as needed to ensure the accomplishment of key regulatory functions in the future.</p> |
| | <p>Observation: For exercising its responsibilities in the area of review of assessment of the licensee submittals SÚJB makes use of technical or other expert professional advice or services as necessary, in particular in areas where internal capabilities may be not available (e.g. material science, pressurized equipment, thermal hydraulic analysis). This practice shall not relieve the regulatory body of its assigned responsibilities.</p> <p>Core competences necessary to make informed and technically based decisions have been developed for new projects (e.g. siting of new NPPs) and need to be completed and regularly updated for all areas.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 15 states that <i>“The regulatory body shall obtain technical or other expert professional advice or services as necessary in support of its regulatory functions, but this shall not relieve the regulatory body of its assigned responsibilities.”</i></p> |
| (2) | <p>BASIS: GSR Part 1 Para. 4.22 states that <i>“The obtaining of advice and assistance does not relieve the regulatory body of its assigned responsibilities. The regulatory body shall have an adequate core competence to make informed decisions. In making decisions, the regulatory body shall have the necessary means to assess advice provided by advisory bodies and information submitted by authorized parties and applicants.”</i></p> |
| S4 | <p>Suggestion: SÚJB should consider formally define core technical competences in all areas of its activities and ensure that these are represented in the available staff in order to properly discharge its regulatory responsibilities.</p> |
| | <p>Observation: Training of the regulatory body personnel is based on nationally applicable rules for maintaining and improvement of qualification of workers in the state administration. Significant progress has been made by SÚJB in the area of education and training process implementing a state of the art methodology. The implementation of the systematic approach to training still needs one additional step for improvement.</p> |
| (1) | <p>BASIS: GS-G-1-1 Para. 5.5 states that <i>“Efforts commensurate with the size of the regulatory body should be made to develop a systematic approach to the training of the personnel in order to ensure consistency in the conduct of regulatory activity including the application of quality assurance principles to training.”</i></p> |
| S5 | <p>Suggestion: SÚJB should consider introducing a process for feedback from the trainees as a mandatory step for improvement of the systematic approach to training process and quality assurance principles to training.</p> |

3.4. LIAISON WITH ADVISORY BODIES AND SUPPORT ORGANIZATIONS

In order to support its review and assessment activity in the field of nuclear safety, SÚJB contracts expert organizations. Support in the field of radiation protection and chemical and radiation safety is provided by public research institutions functionally related to SÚJB (i.e. National Radiation Protection Institute (SÚRO) and National Institute for Nuclear, Chemical and Biological Protection (SÚJCHBO)). These research institutions are funded within the State budget.

Advisory groups of independent experts in nuclear and radiation safety are in place to advise the SÚJB chair concerning strategic questions on an ad hoc basis.

Expert organizations are selected and contracted according to administrative rules generally applicable to state administrative bodies and the SÚJB budget enables it to use such contractors. Organisations supporting SÚJB do not perform supervisory or inspection activities. They may be invited only to participate in the inspection or to provide independent opinions based on their expertise.

SÚJB has highlighted to the IRRS team the need to improve the process for accessing external qualified technical support in a more timely and systematic manner. To that end, it is planned to establish a permanent TSO which would enable a long-term and expanded support role mainly in connection with the anticipated construction of new nuclear units. A tender for this is currently open.

There are cases in which the advice provided by a supporting organization is from an authorized party itself or is associated with an operating organization. This requests a proper management of potential conflicts of interests. The independence of expert support provided to SÚJB as well as possible conflicting interests are addressed in the respective contracts. The need for establishing a procedure identifying specific management rules in this regard has been identified.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | <p>Observation: For review and assessment activities external expertise e.g. research institutes, universities etc. (called Technical Support Organizations, TSO) are often used. There are cases in which the advice is necessarily provided by a supporting organization which is an authorized party itself or is having a liaison with the operating organization so requiring the proper management of potential conflicts of interests.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 20 Para. 4.18 states that <i>“The regulatory body may decide to give formal status to the process by which it is provided with expert opinion and advice. If the establishment of advisory bodies, whether on a temporary or a permanent basis, is considered necessary, it is essential that such bodies provide independent advice, whether technical or non-technical in nature.”</i></p> |
| (2) | <p>BASIS: GSR Part 1 Req. 20 Para. 4.20 states that <i>“Arrangements shall be made to ensure that there is no conflict of interest for those organizations that provide the regulatory body with advice or services⁸. If this is not possible domestically, than the necessary advice or assistance shall be sought from organizations in other States or, as and where appropriate, from international organizations which have no such conflict of interest. If an organization that provides the regulatory body with advice or services were also to advise an authorized party on the same subject, the potential conflict of interest could compromise its reliability.”</i></p> |
| (3) | <p>BASIS: GSR Part 1 Req. 20 Para. 4.21 states that <i>“If the necessary advise or assistance can be obtained only from organizations whose interests potentially conflict with those of the regulatory body, the seeking of this advice or assistance shall be monitored, and the advice given shall be carefully assessed for conflicts of interest.”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

R4

Recommendation: It is recommended that a specific procedure is developed, identifying the rules to manage the selection process of TSOs and the monitoring of their work, to ensure that potential conflicts of interest do not compromise the reliability of the received advice.

3.5. LIAISON BETWEEN THE REGULATORY BODY AND AUTHORIZED PARTIES

Liaison with authorized parties follows general administrative rules for state administrations.

SÚJB has established both formal and informal mechanisms of communication with authorized parties to ensure professional liaison. Formal mechanisms comprise official correspondence between SÚJB and authorized parties and inspections of the licensed activities. It is also possible for SÚJB to invite authorized parties to participate in official administrative proceedings. The informal mechanisms consist of informal meetings as well as discussions between individuals at different levels of the organizations. Licence holders receive advance communication of regulatory decisions pertaining to their activity and they are invited to formulate observations during the drafting process of regulations by SÚJB.

The SÚJB Chairperson is regularly invited to participate in the Safety Committees established at the Operators' Headquarters.

As a general requirement of administrative proceedings of state administrations the basis for the requirements established for licence holders must be included in a decision.

The Ethical Codex of SÚJB employees define principles and instructions containing elements which apply to liaison with licensees.

SÚJB will provide advice to any person on their rights and duties, and if necessary SÚJB will provide advice on regulations with respect to their personal situation. SÚJB follows the principles of natural justice and will provide affected parties with appropriate opportunities to defend their lawful interests. SÚJB is obliged to act without unreasonable delay so that no party incurs unnecessary cost or burden.

SÚJB inspectors can access any area of the regulated installation, request documentations and other evidence of compliance with regulations and licence conditions and request specific tests, etc. They can issue requests for corrective actions with the inspection report. Inspectors are normally resident on the sites. A formal rotation policy is not in place. However, exchanges of inspectors among installations take place (see chapter 7) in case of special inspections. Inspectors are required to perform their duties in accordance with principles established in the SÚJB ethical code.

3.6. STABILITY AND CONSISTENCY OF REGULATORY CONTROL

SÚJB performs its regulatory functions on the bases of the applicable legal framework. Decrees for the implementation of the Atomic Act setting obligatory requirements are proper bases to provide stable and predictable regulatory expectations. Guidelines recommending ways to meet the binding legislative requirements are issued by SÚJB in the form of instructions. These instructions can become binding if attached to the licence as a condition.

The basis for any regulatory decision has to be provided to the interested licence holder. All regulated activities are subject to the corresponding administrative procedure.

Procedures to be followed by SÚJB staff workers in administrative proceedings, including inspections, are defined in specific provisions of national legislation applicable to all state administrations. In order to

maintain the necessary consistency in the performance of regulatory activities, a set of internal instructions has been established. The established Ethical Code of employees facilitates impartial and objective performance of inspections.

3.7. SAFETY RELATED RECORDS

SÚJB has established and maintains registers and inventories of sealed radioactive sources and radiation generators, occupational doses, authorized legal entities, inspections, authorizations and events, including non-routine releases of radioactive material to the environment.

Other databases cover information about records and documents for safety assessments, inventories of radioactive waste and of spent fuel and a database of materials used in the construction of nuclear installations.

Records are kept both electronically and on paper. They are used by SÚJB in its regular inspection activity and as a basis for its reporting.

The national system of registration of sources of ionising radiation is maintained through an electronic database on the basis of information provided by licence holders and registrants as required by legislation.

For the national system of records of exposure of individuals, information on personal doses of employees (results of personal monitoring) is provided by licence holders through authorized dosimetry services.

In the field of nuclear safety, SÚJB documents all the important events in nuclear power plants and the results of their investigation including the imposed corrective actions. The investigation of events is subject to inspection activity and the results of inspection activity are also archived. The different steps for implementation of the procedure for granting licences are also documented.

Events at NPPs have to be reported to SÚJB. A dedicated “information agreement” with the relevant NPP operator was previously in place. It defines classes of events which have to be reported with the content and timing of the information to be provided. IRRS team was informed that a specific guide has been recently prepared on this subject. It defines classes of events which have to be reported with the content and timing of the information to be provided.

Information on occurrence or suspected occurrence of a radiation accident is immediately reported by licence holders to SÚJB which has established a continuous mechanism for reporting events. Contact Point is functioning continuously. Any event with seizure of radioactive material is also recorded.

Data on radioactive waste are recorded during its collection, sorting, processing, treatment, storage, transportation and disposal. Every radioactive waste management license holder has to deliver to SÚJB a report containing the inventory of radioactive waste in their possession on an annual basis. This information is prepared in the form of an annual report and is made available on SÚJB web site. SÚJB also provides records of inventories of radioactive waste and spent fuel to the IAEA database systems.

3.8. COMMUNICATION AND CONSULTATION WITH INTERESTED PARTIES

SÚJB uses both formal and informal ways of communication and consultation with interest parties taking into account communication rules established in the legislation.

Consultation with applicants and authorized parties are very frequent during the implementation of a specific licensing procedure. It may comprise correspondence, meetings, seminars and personal contacts. The results of inspection are announced to the inspected entity in the form of a record often personally hand delivered by the lead inspector.

The approach of SÚJB to informing the public is defined in a specific internal procedure.

SÚJB issues a detailed annual report on its activities which is published on its website.

Decrees implementing the Atomic Act are officially published in the Collection of Laws of the Czech Republic and they are also available on the SÚJB website. A public consultation process is also conducted during the preparation phase of the new act.

Also Guidelines as well as information on procedures and important decisions of SÚJB are available through the website.

The participation of the public in relation to deciding on new nuclear installations is assured through an environmental impact assessment (EIA) conducted by the Ministry of Environment, where SÚJB is one of the concerned bodies of state administration.

A great deal of detailed information relating to risks associated with ionising radiation is available on the SÚJB website and on the websites of cooperating institutions (e.g. SÚRO).

Information about the operation of nuclear installations including any events occurring at the nuclear installations is published in the Annual SÚJB Report and regularly on the website of SÚJB. In the case of more serious situations, SÚJB provides information directly through the public media.

Information meetings with local community administrations of the nuclear installation sites are held on a periodic basis.

According to its transparency and communication policy, SÚJB is open to receiving submissions, commentary and opinions from interested parties which may result in a review and reconsideration of its regulatory activity. An electronic system for answering questions from the public is available on the SÚJB website and answers are promptly provided. In extraordinary cases, as in the aftermath of the Fukushima accident, special means for communicating with the public through the web are also established.

As part of the procedures related to nuclear installations, SÚJB cooperates with other state administrative bodies (Construction offices, Fire rescue service, Ministry of the Environment). Memoranda of Understanding are in place with other bodies in order to improve coordination.

Policy Discussion 1 – SÚJB Management Scheme

The policy discussion on SÚJB Management Scheme was introduced by a presentation from SÚJB, which highlighted that the objective is to discuss, in the presence of international experts, the pros and cons of possible change in the SÚJB management organization from classical pyramid scheme headed by a chairperson to a collective method of management in the form of five-member commission.

This issue is important in relation to the finalization of the new Atomic Act, which is currently undergoing a broad consultation process among various departments of the Czech government, other authorities of the state administration and non-governmental organizations.

A number of elements addressed in the proposed change were highlighted, including:

- The proposed Commission should have a chair, who will be the SÚJB chairperson and four members, who will be assigned responsibilities in a specific area of nuclear and radiation safety and they will manage these technical departments
- The main role of the commission will be to make strategic and policy decisions for the organization

- Changes in the way the Chairperson and his/ her deputies are selected (e.g. currently the Chair selects the deputies; in the future will be the Parliament) and the relevant requirements for education and experience in nuclear and radiation safety, which should be defined by the new Law; in addition each Commissioner should be appointed for a five-year period
- The current SÚJB Vice-chairs (three) will be replaced by the members of the Commission (four)
- There should be minimal financial implications for the organization, because the change the change would cause an increase in only one post in the Office management.

The IRRS reviewers provided an overview of various approaches used in their countries in relation to corporate governance and provided feedback on the proposed changes. These include:

UK

- ONR has recently transitioned to a new organizational model and is now working towards becoming an independent statutory corporation.
- The ONR Executive Leadership Team is responsible for the running of ONR. The ELT members are the Chief Executive Officer, Chief Nuclear Inspector, Deputy Chief Executive and Director of Finance and the First Deputy Chief Inspector.
- ONR has a Board , with executive and non-executive members and its role is to provide leadership, set strategy, agree the overarching policy framework within which ONR operates as a regulator, agree and monitor resources and performance and ensure good governance
- The position of the Chief Nuclear Inspector will be responsible for all nuclear regulatory decisions, for providing independent regulatory advice to government departments and other government bodies on matters related to the safety, security, radioactive materials transportation, and safeguards of nuclear facilities and activities.
- The UK Corporate Governance Code applies to ONR

US

- The US NRC governance model appears to be very close to the proposed changes in SÚJB governance
- Consideration should be given to the potential financial implications, which may be bigger, due to the costs associated with making public the regulatory decisions, the amount of infrastructure needed to support it, including access to information aspects.
- Assignment of each commissioner to a technical area may be an issue, due to the fact that one Commissioner may drive a certain area of the organization. This situation is avoided by the current arrangements in US. Delineation between managing a technical area and making policy decisions should be maintained.
- No Commissioner may have any direct conversation with US NRC staff

Switzerland

- In Switzerland there is a similar situation, but with two Boards: a Board of Directors, with seven members, who sets yearly goals to the executive Board

Finland

- STUK does not have such a corporate governance and there are no changes foreseen in the near future

Canada

- In Canada there is a Commission (Board), with seven permanent members. Temporary members may be appointed, as needed.
- The Board is separated from CNSC staff and one member of the Board is the CNSC President and CEO
- There is no interaction between CNSC staff and Commission, as per the provisions of the Nuclear Safety and Control Act
- All decision are made by the Commission in a public forum

Australia

- The CEO is appointed by Government. A Senior Management Committee (previously known as the Executive Board of Management) exists, but the CEO is ultimate decision maker.
- Other Australian Government organizations have Boards, e.g. Reserve Bank of Australia which has a non-executive Board
- Having a Commissioner with a line-management responsibility may be of concern creating potential conflicts of interest, but without line management responsibility may create a void above section heads

Netherlands

- In the Netherlands the regulatory body will be reorganized and to be aligned with the Administrative Law there will be a Commission. There will be no direct link with executive operation of RB. The precise role of the Commission and the financial implications are still under discussion.

In the subsequent discussion, it was indicated that:

- While Commissioners will have topical responsibilities, they will not have any assigned staff
- 11 organizational (operational) units will report to Commissioners. Some executive functions, which are currently the responsibility of the deputy chairs will be transferred to the Office Bureau (e.g. for signing contracts)
- The work of the Chairperson will be supported by the Office Bureau, who is currently having 15 staff members.

At the end of the discussion, the IRRS Team Leader observed that improved strategic leadership and management of SÚJB will improve the ability to respond to the IRRS findings, particularly those on the management system and on management of financial and human resources. He also made three specific observations:

Role of Commissioners

SÚJB envisages that the role of the Commissioner will be strategic and that commissioners will not have direct management responsibility for organizational units. If this approach is adopted the impact on effective line management in the organization will need to be considered.

Operation of the Commission

Members of the Commission will have different expertise but will be expected to reach collective decisions based on information provided by the Office Bureau. It will be important to manage potential conflicts of interest in relation to assignment of each commissioner to a technical area.

Costs and benefits

The proposal will result in an increased operational cost for SÚJB. It should be possible to demonstrate, in qualitative and quantitative terms, that the enhanced strategic oversight will lead to improvements in organizational effectiveness and efficiency.

Policy Issue 2: Transparency

The IRRS team held policy discussions related to transparency of SÚJB with the public and the interested parties with Czech's counterpart during the mission. The objective of this policy discussion is to exchange experience with the IRRS team on effective regulatory policy in implementing efficient communication and consultation processes with the public and the interested parties. The policy discussion started with an introduction by Ms Dana Drabova, SÚJB Chairperson, providing an overview of the current activity being conducted by SÚJB to communicate and consult with the public and the interested parties.

The Government of Czech republic has established a long term policy to reach high level of transparency that has been reflected in the legislation and Government directives. The Act on Free Access to Information forms the legal base for Governmental institutes to provide information to the public. Act on Security of Classified Information is limited only to the physical protection of nuclear installations and radioactive material. The Atomic Act provides for SÚJB to submit annual report on its activities which is published in its website. The report contains detailed information including; regulatory analytical and inspection activities, major events, authorizations, drills, radiation situation on Czech territory and the annual financial statement on SÚJB budget. In extraordinary cases such as Fukushima accident SÚJB created special means for communication with public. SÚJB also, organizes training events to the staff on public communication. SÚJB has a good cooperation with the neighbouring countries in the field of exchanging information.

Some of the IRRS team member presented their countries experiences and the good practices in communicating and consulting with the public which can be summarized in the following:

- Using dedicated types of reports for informing different groups, special consideration should be given to the level of technical details in the report.
- Using of the graded approach to deal with public. Public near the vicinity of the plant is more informed and consulted on the safety and the emergency issues
- Selection of appropriate tools for communications to inform the public and the different specialized groups
- Specialized training programmes for the regulatory body staff on how to communicate with public
- The operators should have their own internet sites to communicate with the public to ensure regulatory body independency from licensees.
- Establishment of dedicated sites by the regulatory body using different languages to inform the public in the neighbouring countries

The policy discussion concluded the following:

- The importance of establishing a communication and consultation strategy to inform the public and the interested parties
- The need for developing communication and consultation plans that take in consideration the groups and the communication tools to be used for effective transparency

- To develop system for evaluating the existing methods and practices used for consultation and communication with public to provide feedback for continuous improvement.
- Security of some information need to be considered
- Provision of appropriate funds for communication and consultation processes
- Development of guidelines to establish effective communication and consultation process

3.9. SUMMARY

SÚJB receives its financial resources the State Budget approved every year by the Parliament. The State reimburses about 60% of costs through fees from the licensees. SÚJB has informed the IRRS team that up to now it has not experienced difficulties in planning and allocation from the State Budget the resources it needed. Based upon its position as a governmental organization, SÚJB is fully independent in its decision making process.

The SÚJB organization is well focused on the regulatory tasks established in the legislation. The IRRS team has noted that a large number of staff is approaching retirement and there are some areas with a very limited number of staff so that the development of a long term strategy for recruitment is considered necessary.

Core competences necessary to make informed and technically based decisions have been developed for new projects (e.g. siting of new NPPs) and need to be completed and regularly updated for all areas and to be formally defined, ensuring that all these competences are represented in the available staff.

SÚJB receives support for its review and assessment activity from external organizations. There are cases in which the supporting organization is an authorized party itself or has liaison with the operating organization. This requires a proper management and monitoring of the advice received for which specific rules should be developed.

Significant progress has been made by SÚJB in the area of education and training by implementing a state of the art methodology. The implementation of a systematic approach to training can be however further improved by introducing a process for feedback from the trainees.

The IRRS team recognizes that effective systems for keeping records and communicating with interested parties are in place.

4. MANAGEMENT SYSTEM OF THE REGULATORY BODY

4.1. IMPLEMENTATION AND DOCUMENTATION OF THE MANAGEMENT SYSTEM

The regulatory procedures described in the SÚJB management system are derived from Czech legislation and regulations, SÚJB Management System Policy and international standards and recommendations. The IAEA standards are taken into account when developing SÚJB management system components.

SÚJB considers the current management system documentation structure complicated and an update is required in order to make it streamlined, logical, not overlapping and up-to-date all the time. A dedicated action plan is being implemented by SÚJB with the aim to align the structure of the current the management system documentation to the structure recommended by GS-R-3. The revised management system documentation will be structured in four layers. At the top level will be the SÚJB Management System Policy, secondly the general manual pertaining to SÚJB administration and work principles. The third and fourth level will encompass procedures and work instructions specific for section/department/unit.

The SÚJB Management System Policy is meant to describe the main policy statements and goals of SÚJB. It provides a common understanding of the high quality criteria in SÚJB activities and sets out the, vision, mission and values and prescribes the management objectives.

All internal management system documents are available on the intranet. The Management System Policy and SÚJB Annual Management Objectives are also available on the SÚJB website.

Priority to safety is promoted at the level of management system by means of the Safety Policy and the Management Policy documents.

In addition to the principles and organization of the SÚJB management system documentation, the new SÚJB Management System Manual provides, in the annexes, the lists of the system processes as well as the list of the working instructions.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: In the new SÚJB Management System Manual there is a single sentence dedicated to the graded approach: “In the internal documentation development process, each author shall bear in mind and apply the principles of graded approach.” This appears insufficient to enable an understanding of the expectations regarding the application of the graded approach in the activities of all processes. The graded approach needs to be better described and formalized in a manner that applies to all management system processes. For example, it could be explained how the graded approach is reflected in the levels of approval, the depth of the regulatory reviews, the degree of detail provided in the internal procedures, and training and qualification requirements, etc.</p> |
| (1) | <p>BASIS: GS-R-3 Para. 2.6 states that <i>“The application of management system requirements shall be graded so as to deploy appropriate resources, on the basis of the consideration of:</i></p> <ul style="list-style-type: none">- <i>The significance and complexity of each product or activity;</i>- <i>The hazards and the magnitude of the potential impact (risks) associated with the safety, health, environmental, security, quality and economic elements of each product or activity;</i>- <i>The possible consequences if a product fails or an activity is carried out incorrectly.</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | BASIS: GS-R-3 Para. 2.7 states that <i>“Grading of the application of management system requirements shall be applied to the products and activities of each process.”</i> |
| | Recommendation of the IRRS Team related to this issue is given in item e) of the general Recommendation related to compliance with IAEA safety standard requirements at the end of the chapter. |

GS-G-3.1 provides more guidance on the implementation of the graded approach, in paragraphs 2.37 – 2.44, and may be used to further develop the definition of the graded approach in the SÚJB Management System Manual.

Supervision of safety has priority in all SÚJB activities and this principle is used to develop and maintain a safety culture at the organizational level.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: There is no formal process for promotion and development of safety culture at the level of organization. |
| (1) | BASIS: GS-R-3 Para. 2.5 states that <i>“The management system shall be used to promote and support a strong safety culture.”</i> |
| | Recommendation of the IRRS Team related to this issue is given in item b) of the general Recommendation related to compliance with IAEA safety standard requirements on management systems at the end of the chapter. |

4.2. MANAGEMENT RESPONSIBILITY

A management commitment is expressed through the SÚJB Management System Policy. The expectation of the interested parties are implicitly considered in the SÚJB Management System Policy and further reflected in the system of procedures/instructions concerning the duties and responsibilities of each SÚJB employee.

SÚJB is a part of the broader Government structure and is obligated by law to develop strategies and plans as do other ministries and offices of the central administration in order to ensure proper resources (financial, human) for effective discharge of regulatory duties. Rules of the Government are obligatory to follow in this respect.

Specific short term management goals/objectives are stated annually by each of the three main SÚJB sections and summarized at general level in the document “SÚJB Annual Management Objectives”.

Regular management review meetings are held throughout the year with the purpose to review the activities of the organization as well as the fulfilment of the SÚJB annual management objectives.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: Regarding the management of organizational change, no information is provided in the Management System Manual and there is no specific internal procedure addressing this generic management system process. |
| (1) | BASIS: GS-R-3 Para. 5.28 states that <i>“Organizational changes shall be evaluated and classified according to their importance to safety and each change shall be justified.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | BASIS: GS-R-3 Para. 5.29 states that <i>“The implementation of such changes shall be planned, controlled, communicated, monitored, tracked and recorded to ensure that safety is not compromised.”</i> |
| | Recommendation of the IRRS Team related to this issue is given in item d) of the general Recommendation related to compliance with IAEA safety standard requirements on management systems at the end of the chapter. |

4.3. RESOURCE MANAGEMENT

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). This also includes the SÚJB management system, its maintenance and further development.

SÚJB as a body of the central administration has its own chapter within the Act on State Budget which is approved by the Parliament. Adequate resources needed for its operation are therefore ensured through standard state budget planning procedures required for all parts of the Government (ministries, central offices). There are mainly three year mid-term work/financial planning exercises

Subsequently in the detailed annual SÚJB budget and associated plans/programmes both financial and (subsequently) human resources are allocated to different areas of regulatory activities as well as to administration and to development activities. These plans are discussed first at the different levels of management meetings and finally approved at SÚJB management meeting and signed by SÚJB Chairperson.

The training needs of each employee are discussed annually and consequently the development of personal competencies and skills and a competence development plan is then devised.

4.4. PROCESS IMPLEMENTATION

The SÚJB management system is in a transitional phase moving from a system with 150 documents organized in 2 layers to a system consisting of 4 layers of documents organized into process documents, sub-process documents, working instructions, internal guides, etc. as recommended by GS-R-3.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: Documents of the SÚJB’s Management System are not completely harmonized with the structure and content of the management system documents required by IAEA safety standards (e.g. transitional phase is not yet completed, grouping the management system processes into the core, support and management processes). There are elements and requirements of GS-R-3 which are not currently met in SÚJB management system documents (e.g. use of process flow charts, process measurements criteria, etc.). |
| (1) | BASIS: GSR Part 1 Req. 19 states that <i>“The regulatory body shall establish, implement, and assess and improve a management system that is aligned with its safety goals and contributes to their achievement.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | <p>BASIS: GS-R-3 Para. 5.4 states that <i>“The development of each process shall ensure that the following are achieved:</i></p> <ul style="list-style-type: none"> - <i>Process requirements, such as applicable regulatory, statutory, legal, safety, health, environmental, security, quality and economic requirements, are specified and addressed.</i> - <i>Hazards and risks are identified, together with any necessary mitigatory actions.</i> - <i>Interactions with interfacing processes are identified.</i> - <i>Process inputs are identified.</i> - <i>The process flow is described.</i> - <i>Process outputs (products) are identified.</i> - <i>Process measurement criteria are established”.</i> |
| | <p>BASIS: GS-G-3.1, Para. 5.5 states that <i>“Processes developed using a top-down approach should be hierarchically linked and should be more detailed the closer they are to the technical or task level. At the technical level the process may be better described in a procedure or instruction. The operational framework within an organization is typically made up of a number of processes, most of which have interfaces across the organization. Some organizations have found it beneficial to structure their processes as follows:</i></p> <ul style="list-style-type: none"> - <i>Core processes, the output of which is critical to the success of the facility or activity;</i> - <i>Supporting processes, which provide the infrastructure necessary for the core processes (e.g. procurement training);</i> - <i>Management processes, which ensure the operation of the entire management system.”</i> |
| | <p>Recommendation of the IRRS Team related to this issue is given in item a) of the general Recommendation related to compliance with IAEA requirements on management systems at the end of the chapter.</p> |

While rebuilding the management system processes, SÚJB should consider using sub-processes instead of using multiple independent processes that represent particular activities of the same general process (e.g. use of sub-process for the inspection process).

Development, revision and approval of documents are made in accordance with a specific procedure. The current SÚJB practice for document control conforms to the current standards.

4.5. MEASUREMENT, ASSESSMENT AND IMPROVEMENT

SÚJB has planned a system for monitoring, measurement, assessment and review of activities that include internal audits, self-assessments, management reviews and external audits (IRRS, government audits in specific areas).

While the system of internal audits is requested legally and audits are performed 3-5 times per year, the application of other instruments for measurement, assessment and improvement of the management system is made by means of management decision.

In the present system the key instrument for review and effectiveness evaluation of SÚJB management system is an internal audit. The Internal Audit Unit is directly subordinated to the SÚJB Chairperson. The audit results are discussed in the framework of a management meeting and a corrective plan is approved at the level of SÚJB. Risk analysis is an internal part of annual planning.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The new Management System Manual provides the basis for formalization of the requirements with regards to the periodicity or scope of individual self-assessments or management reviews but this process is not yet completed (e.g. implementation of self-assessments of processes and performance as routine activities). SÚJB took action to review the internal procedures for management reviews and self-assessments in order to achieve better coverage and periodicity at different levels of the organization. |
| (1) | BASIS: GSR-R-3 Para. 6.2 states that <i>“Senior management and management at all other levels in the organization shall carry out self-assessment to evaluate the performance of work and the improvement of the safety culture”.</i> |
| (2) | BASIS: GS-G-3.1 Para. 6.12 states that <i>“Individuals and management (other than senior management) at all levels in the organization should periodically compare present performance with management expectations, worldwide industry standards of excellence and regulatory requirements to identify areas needing improvement”.</i> |
| (3) | BASIS: GS-G-3.1 Para. 6.13 states that <i>“Each unit within the organization should routinely conduct its own self-assessments of processes and performance”.</i> |
| (4) | BASIS: GS-G-3.1 Para. 6.14 states that <i>“Managers and individuals should seek continual improvement by identifying areas needing improvement and then taking corrective actions. The need for improvement should be recognized as a normal part of routine work”.</i> |
| | Recommendation of the IRRS Team related to this issue is given in item c) of the general Recommendation related to compliance with IAEA requirements on management systems at the end of the chapter. |

In addition, SÚJB recently implemented a new system to collect feedback from staff, counterparts and stakeholders including the general public. Implementation of the actions from the corrective action plan is monitored and meetings for review and update the corrective action plan are held every two months.

The external audit is practised both on the international level (IRRS organised by IAEA according to EU directives, other missions organised by IAEA as needed by SÚJB), and on a national level by the relevant bodies in compliance with the procedures laid down within the Czech legislation. The obligation for performing periodic external assessment and criteria for initiating such review is provided in the new Management System Manual.

At several points of this chapter and at a particular point of Chapter 6 reference is made to the general Recommendation below. At these points the Observations related to the issue, the IAEA safety standard requirements or guidance forming the Bases for the recommended actions and reference to the particular issues in the Recommendation below is given and shall not be repeated here.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| R5 | <p>Recommendation: SÚJB should further develop and implement its Integrated Management System for satisfying fully the requirements set out in IAEA safety standards and guides with regard to:</p> <ul style="list-style-type: none">a) process implementation;b) promotion of safety culture;c) measurement, assessment and improvement;d) management of organizational changes;e) application of graded approach |
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4.6. SUMMARY

SÚJB has a management system in place that describes the tasks and responsibilities of all organizational units and persons, as well as management practices and internal communication at all levels. However, there are elements and requirements from IAEA safety standards and guides that are not currently met in SÚJB management system documents. Therefore further development and reviews are necessary for satisfying fully the requirements set out in the IAEA safety requirements.

SÚJB is currently implementing a set of actions for improvement of its management system and expressed their commitment for continuous improvement programme making use of the current IAEA safety standards as well as of the results of the specific management processes such as self-assessment, independent assessment and management system review, conducted at regular intervals.

5. AUTHORIZATION

5.1. GENERIC ISSUES

The Czech Republic has several nuclear facilities, including a uranium mine and tailing storage facilities, nuclear power reactors, research reactors, spent fuel storage and waste repositories, as well as activities involving sources of ionizing radiation in medicine, industry, research, agriculture and transport.

The IAEA safety standards require that a regulatory body shall conduct authorizations and require demonstration of safety from the licensee. The Atomic Act contains provisions which adequately address these requirements, and establishes the SÚJB as the competent authority to perform State administration and supervision of the utilization of nuclear energy and ionizing radiation and in the field of radiation protection and to issue approvals for prescribed activities.

In accordance with the Atomic Act, the applicant is responsible for nuclear and radiation safety, physical protection of nuclear installations and emergency preparedness, including safety verification and for demonstrating compliance with the requirements of the Atomic Act. The SÚJB is required to conduct a review and assessment of the applicant's safety case before issuing an approval. The Atomic Act defines the conditions which have to be fulfilled by the applicant and defines the documentation which has to be submitted to SÚJB. SÚJBs review and assessment results related to the authorization are documented according to SÚJB's management system. Decisions and related documents are available on request to the public according to the legislation.

Any change affecting nuclear safety, radiation protection, physical protection and emergency preparedness of a nuclear installation or category III or IV workplace must be reported to the SÚJB. Changes of this nature include changes to equipment, changes to an activity that formed part of the original authorization, or changes in relevant documentation. SÚJB's approval is required for changes with significant implications for safety prior to making the change.

In addition to authorizing installations and activities as described above, SÚJB authorizes specific licensee staff members (e.g. operators in the control room and personnel providing professional training).

The Administrative Act contains provisions for appealing decisions made by SÚJB. The appeal instructions always form part of the SÚJB authorizations and decisions, which address the rights and obligations of the licensee or the applicant.

5.2. AUTHORIZATION OF NUCLEAR POWER PLANTS

The main stages of the licensing process of NPPs are as follows: completion and acceptance of the Environmental Impact Assessment (EIA) and then licensing of the siting, construction, commissioning, , commercial operation and decommissioning. The EIA process must be completed by the Ministry of Environment prior to SÚJB proving its approval for siting.

The authorization process in the Czech Republic for the siting, construction and operation of a nuclear power plant is regulated by the Atomic Act in conjunction with the Civil Construction Act and involves approvals from several competent authorities and a license by the Construction Office. A licence by the Construction Office can be issued once approval has been obtained from a number of competent authorities addressing specific technical areas, which include nuclear and radiation safety, conventional safety, fire protection and occupational hygiene etc. In accordance with the law and the administration code, the assessments by the various authorities are conducted independently from each other, and have

independent bases. The IRRS team concluded from the presentation of this process that this might lead to undue duplication, and that consideration should be given to additional cooperation.

The licensing of the site is primarily focused on assessment and evaluation of site characteristics and site compliance with the requirements as set up in the Decree 215/1997. The document contains both exclusion criteria (e.g. seismicity of the site) which prevent issuance of a permit, and conditional criteria which allow progress when specified conditions are fulfilled. It is important to note that this authorization stage also includes a preliminary assessment and evaluation of the design concept of the planned NPP and preliminary concepts of radiation protection, waste and spent fuel management, decommissioning, physical protection and emergency planning. Information and data relevant to NPP siting and safety demonstration and justification are submitted by the applicant to SÚJB for evaluation in a form of the Initial Safety Analysis Report. The site licensing also includes SÚJB evaluation and approval of the quality assurance and quality management system of the applicant that is relevant to the siting process.

The licensing of the NPP construction is focused on design evaluation; specifically on whether there is sufficient information and supporting evidence that the proposed design meets all requirements for nuclear and radiation safety and emergency preparedness set up by the different decrees. Information and data relevant to NPP construction, and safety demonstration and justification are submitted by the applicant to SÚJB for evaluation under the form of a Preliminary Safety Analysis Report. The construction licensing process also includes independent evaluation of radioactive waste and spent nuclear fuel generation and management, radiation protection, physical protection and evaluation of the concept of NPP decommissioning. In addition, the construction licensing process includes SÚJB assessment of the readiness of the applicant and its suppliers for construction activities, and also an evaluation and approval of the quality assurance and quality management system of the applicant and its main suppliers relevant to the construction of the NPP.

The licensing of the NPP commissioning and operation is focused on an evaluation of the readiness of the NPP and the personnel for tests performed before the first nuclear fuel loading into the reactor, for the fuel loading into the reactor, for the tests carried out with the nuclear fuel in the reactor and for the trial and commercial operation. SÚJB's assessment of the relevance and completeness of the tests and SÚJB independent assessment of safety is carried out based on reviewing the updated Safety Analysis Report and test documentation. Evaluation of the on-site and off-site emergency preparedness and plans is part of the commissioning authorization process and changes influencing the off-site emergency plan may only be performed subject to an agreement with the relevant District Authority. The final license for operation is granted for an unlimited period of time. To ensure that the licensee keeps the state of nuclear safety of the operated nuclear facility as high as reasonably practicable, SÚJB attaches conditions to the license requiring the licensee to conduct a comprehensive periodic safety review every ten years. Periodic Safety Review follows the IAEA guidance in the area and e.g. ageing management is an essential part of the review.

The regulation covering the design of nuclear power plants is specified in a decree that was issued in 1999. This decree does not adequately address the safety requirements in the IAEA Safety Standards on the design of NPP, IAEA Safety Standard SSR-2/1 (2012). The team was informed that, in particular, the decree does not adequately address the requirements in SSR-2/1 covering periodic safety reviews, the use of probabilistic safety analysis and the assessment of severe accidents. These omissions have been previously addressed by an internal Chairman Binding Instruction requiring SÚJB to produce safety guidelines which are shared with the applicant and attached as license conditions in decision letters, e.g. permission to start-up after refuelling. Further, SÚJB is currently making provisions in order to cover these issues in the new upcoming regulations.

Internal guidance for the authorization process is contained in Internal Documented Instructions (VDS and Chairperson’s binding orders), which cover the authorization stages of siting, commissioning and modifications. Internal guidance addressing other authorization stages, e.g. construction, decommissioning and release from regulatory control, are currently not available. To ensure consistency in the application of the authorization process and to provide clarity and transparency to both the applicant and other interested parties, internal guidance covering all stages in the authorization process should be developed well in advance of these stages. In respect to the release from regulatory control, SÚJB should establish radiological criteria for the release of the land, buildings and structures from further regulatory control (see section 9.6).

SÚJB is currently assessing the siting of Temelín 3 and 4. To ensure that they have sufficient resources, both technical and number, SÚJB has created a systematic matrix tool which includes qualifications, competences and number of people. In addition to human resources, it also addresses the different tools needed for siting assessment. In view of the extent and completeness of this analysis, the IRRS team identified this as a good practice.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The approvals that are required to be completed, before an authorization for a nuclear installation can be issued, are obtained from several competent authorities. Each competent authority is responsible for confirming independently that its relevant legal requirements have been fulfilled. The team considers that not fully formalized cooperation among relevant authorities might lead to undue duplication, e.g. use of electrical devices on NPP, fire protection. |
| (1) | BASIS: GSR Part 1 Req. 7 states that <i>“Where several authorities have responsibilities for safety within the regulatory framework for safety, the government shall make provision for the effective coordination of their regulatory functions, to avoid any omissions or undue duplication and to avoid conflicting requirements being placed on authorized parties”</i> |
| S6 | Suggestion: SÚJB should consider developing provisions for the effective coordination with other relevant authorities having responsibilities within the authorization process of nuclear installations. |
| | Observation: The decree containing the regulatory design requirements for nuclear power plants does not adequately address certain safety requirements in IAEA safety standard on NPP design, SSR-2/1, e.g. requiring an analysis of design extension conditions and the application of the probabilistic safety analysis method. In order to address this issue, SÚJB has issued guidelines which have been attached to approvals as a license condition. |
| (1) | BASIS: GSR Part 1 Req. 32 states that <i>“The regulatory body shall establish or adopt regulations and guides to specify the principles, requirements and associated criteria for safety upon which its regulatory judgements, decisions and actions are based.”</i> |
| (2) | BASIS: SSR-2/1 Req. 20 states that <i>“A set of design extension conditions shall be derived on the basis of engineering judgement, [...]”</i> . |
| (3) | BASIS: SSR-2/1 Req. 42 states that <i>“A safety analysis of the design for the nuclear power plant shall be conducted in which methods of both deterministic analysis and probabilistic analysis shall be applied.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| R6 | Recommendation: SÚJB should review and revise the decree covering the design requirements for NPPs to ensure that the design requirements take into consideration the IAEA safety standard SSR-2/1 “Safety of Nuclear Power Plant Design”. |
| | Observation: Internal guidance covering all authorization stages for nuclear safety, as specified in the Atomic Act, is not available. Currently, the internal guidance is limited to siting, commissioning and modifications. |
| (1) | BASIS: GSR Part 1 Para 4.26 states that <i>“The regulatory process shall be a formal process that is based on specified policies, principles and associated criteria, and that follows specified procedures as established in the management system.”</i> |
| (2) | BASIS: SSG-12 Para. 2.26 states that <i>“The regulatory body should develop regulations for the licensing process of nuclear installations and should provide guidelines for applicants in order to provide clarity and transparency in the licensing process.”</i> |
| S7 | Suggestion: SÚJB should consider developing further the internal guidance on authorization of nuclear installations to cover all stages specified in the Atomic Act well in advance of these stages. |
| | Observation: SÚJB has created a systematic matrix tool to identify resources needed for siting of Temelín 3 and 4. Matrix includes qualifications, competencies and number of people. In addition to human resources, it addresses also different tools needed for siting assessment. |
| (1) | BASIS: GSR Part 1 Para. 4.11 states that <i>“The regulatory body has to have appropriately qualified and competent staff. A human resources plan shall be developed that states the number of staff necessary and the essential knowledge, skills and abilities for them to perform all the necessary regulatory functions.”</i> |
| GP3 | Good Practice: SÚJB has created a systematic matrix tool to identify resources needed for siting assessment of Temelín 3 and 4. This matrix includes qualifications, competencies and number of people. In addition to human resources, it addresses also different tools needed for siting assessment. |

5.3. AUTHORIZATION OF RESEARCH REACTORS

All the life cycle stages, requirements and processes mentioned above for NPPs are identical for RRs, with the application of the graded approach. Also, all experiments and possible modifications are assessed, evaluated and approved by the same procedures as for NPPs, as only the justification for safety is appropriate to the type of the nuclear installation to be assessed, in accordance with a graded approach.

Three nuclear research reactors are under operation in the Czech Republic: a tank type light water reactor LVR-15 of 10MWth power, a pool type light water reactor LR-0 and a pool type training reactor VR-1, both of 5kWth. Current operating licenses are valid for LVR-15 till 2020, LR-0 till 2020, and VR-1 till 2017. The licensing period was determined according to the practice of reassessment of SAR and aging management.

The license amendment process for modifications is provided in the Atomic Act. There have been activities such as power uprate, installation of new experimental loops, refurbishment of I&C system, and change of nuclear fuel type. These were classified as design changes and activities impacting nuclear safety and the related works commenced only after the approval of SÚJB. In accordance with the

requirements of the Atomic Act, the research reactor operators are required to submit regular reports on compliance with nuclear safety. Minor changes are included in the quarterly and annual reports submitted by the licensee and, if necessary, SÚJB requires corrective measures.

The Safety Analysis Reports for the research reactors have been fully revised in accordance with IAEA SS No. 35-G1 (at present, IAEA SSG-20) and updated during the license period.

5.4. AUTHORIZATION OF RADIOACTIVE WASTE MANAGEMENT FACILITIES

The regulatory requirements for Radioactive Active Waste management and spent nuclear management are defined in the Atomic Act and in a Decree. The Decree states that a licence is required for radioactive waste management that includes collection, sorting, processing, treatment, storage and disposal. The Decree details the limits and conditions for the safe management of radioactive waste.

Low-level and intermediate-level RAW is appropriately managed throughout the cycle to disposal in near-surface repositories. Safety cases were developed for the near-surface repositories that considered both low and intermediate-level waste. The IRRS Team concluded that the waste acceptance criteria ensure the integrity of the safety cases for all the near-surface repositories. The Atomic Act provides the basic legal framework in the Czech Republic compatible with those of EU countries and sets out the fundamental principles of the organizational system which is able to provide for all aspects concerning the safe management of radioactive waste and spent nuclear fuel.

The Concept of Radioactive Waste Management and Spent Fuel Management in the Czech Republic was adopted by the Czech Government on 15 May, 2002 and is a fundamental document which defines the RAW and SF management strategies of the Government and its agencies to approximately 2025, with an outlook to the end of the 21st century. The Concept proposes a solution for the disposal of waste in compliance with requirements for the protection of human health and the environment without excessively transferring any of the current impacts of nuclear energy and ionising radiation utilisation to future generations. Currently, SÚJB has not made arrangements for research to be conducted on that issue. The IRRS team considers that such research would ensure the appropriate and effective review of the safety.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | <p>Observation: Observation: SÚRAO has been tasked on behalf of the government to establish a geologic repository for spent nuclear fuel. There is no plan by SÚJB to conduct independent research or assessments and there is very little interaction with SÚRAO or verification of SÚRAO’s research and assessments programmes.</p> |
| (1) | <p>BASIS: GSR Part 1 Para. 2.32 states that <i>“The government shall make provision for appropriate research and development programmes in relation to the disposal of radioactive waste, in particular programmes for verifying safety in the long term.”</i></p> |
| (2) | <p>BASIS: SSG-14 Section 3.7 states that <i>“The regulatory body has to arrange for independent research and assessments, and has to participate in international cooperation as necessary in order to carry out its regulatory functions. It should also periodically review the adequacy of its regulations and guidance. It may not be necessary to undertake independent research if the regulatory body is satisfied that the operator is undertaking appropriate research that is of sufficient quality and that is subject to independent expert review.”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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Suggestion: SÚJB should consider the arrangements necessary, in isolation or in parallel with the government, for the development of independent research and assessments for the disposal of spent nuclear fuel.

5.5. AUTHORIZATION OF RADIATION SOURCES FACILITIES

A license issued by the SÚJB is required for the management of ionising radiation sources (under the Atomic Act). Requirements on the contents of a license application are prescribed in the Act. Further, a Decree defines practices which require a licence. Licensing is the only form of authorisation (i.e. registration is not used). Notification is sufficient for the use of minor sources.

Uses of radiation sources in the Defence Forces are not regulated by the SÚJB. However, these practices and sources are subject to same legal requirements as any other similar practises and sources. It is up to the Ministry of Defence to ensure compliance with the legal requirements.

Application forms for a license and corresponding instructions are available on the SÚJB website. The process of issuing a license is prescribed in SÚJB internal guidance.

A license is valid until further notice. However, if there is a change in the practice, such as new sources acquired or sources transferred from the licensee, the change shall be submitted to the SÚJB and the license will be amended accordingly. The Atomic Act authorizes SÚJB to set conditions in the license and prescribe alteration, cancellation and cessation of a license.

At the end of their use, sources shall be transferred to another licensee for other use, returned to a supplier, or delivered to a recognized installation or to the RAWRA. Recognized installations include facilities storing disused sealed sources with relatively short half-life, especially Ir-192 sources used in industrial radiography. There is not in place clear provisions on conditions or time frames for storing sources at licensee's promises.

Sources may be recycled to further use by another licensee provided that the source certificate provided by the manufacturer is still valid. The use may be continued beyond this period provided that the integrity of the source is checked in accordance with tests prescribed in the Regulation.

Workplaces are divided into four different categories based on potential hazards. Categories I – III are applicable to the use of radiation sources. Category III and IV workplaces are subject to more stringent requirements including the provision for a financial guarantee to cover future disposal costs.

Radiation sources are divided to “insignificant sources”, “minor sources”, “simple sources” and “significant sources” depending on their activity, type (sealed or unsealed), radiation characteristics and use. Regarding sealed radioactive sources, the categorization is not consistent with the categorization established in the IAEA Standards (GSR Part 3 and Safety Guide RS-G-1.9).

The categorizations of workplaces and sources provide basis for a graded approach to regulatory control.

“Insignificant sources” include sealed sources whose activity is not more than 10 times higher than the exemption level. The use of insignificant sources is exempted, however, the manufacture, import, export or distribution of insignificant sealed sources require a license.

In the case of import or export of radioactive sources outside the EU, the Code of Conduct Import/Export Guidance is followed in practice through license conditions. However, there is no legal provision in place which would require an entity to do so. In the case of import, the Customs check that the recipient is authorized by SÚJB to import (or to use, in case of importing for own use) the source.

While import of radioactive waste is prohibited, the re-import of disused sources produced in the Czech Republic is allowed.

Transfers of radioactive sources from/to other EU Member States are conducted in accordance with the EU Regulation 1493/93/Euratom.

The SÚJB maintains a comprehensive regulatory data system which includes the register of licensees, sources, inspections and occupational exposures. It also includes a file management system including electronic versions of related documents such as licenses and inspection protocols. The main sources of information for the source registry are license applications and notifications from licensees. SÚJB receives monthly or quarterly reports from the dealers of sources on their deliveries. This information is cross-checked with the applications and notifications received from the users of sources. Similar cross-checking takes place at the end of the life cycle of the source in cases where a source is returned to the supplier or where a source is delivered to RAWRA through companies authorized to handle disused sources.

The SÚJB has made an arrangement through which the financial status of all (about 8000) licensees is regularly (weekly) checked from the National Registry of Insolvencies allowing for prompt action by the regulatory authority where the licensees financial situation might endanger its capacity to carry its legal obligations over the sources.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: SÚJB has made an arrangement through which the financial status of all (about 8000) licensees is regularly (weekly) checked from the National Registry of Insolvencies allowing for prompt action by the regulatory authority where the licensees financial situation might endanger its capacity to carry its legal obligations over the sources. |
| (1) | BASIS: GSR Part 1 Req. 4 Para. 4 (f) states that <i>“The regulatory process shall provide a high degree of confidence, until the release of facilities and activities from regulatory control, that: ... (f) Authorized parties have the human, organizational, financial and technical capabilities to operate facilities safely or to conduct activities safely under all circumstances until their release from regulatory control.”</i> |
| (2) | BASIS: CoC on the Safety and Security of Radioactive Sources. Para. 22 states that <i>“Every State should ensure that its regulatory body: ... (c) maintains appropriate records of persons with authorizations in respect of radioactive sources,”</i> |
| GP4 | Good Practice: SÚJB has made an arrangement through which the financial status of all licensees of radiation sources is regularly checked from the National Registry of Insolvencies. |

5.6. AUTHORIZATION OF DECOMMISSIONING ACTIVITIES

For decommissioning purposes, the holder of an operational license for a nuclear installation is obligated to create continually a provision so that monetary funds deposited on a blocked 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 SÚJB.

In addition to the Atomic Act, decommissioning is supported by a Decree. The Decree provides for the scope and method of decommissioning for nuclear installations or category III and IV workplaces. The

Decree sets out the scope and form of documentation for the decommissioning activity which must be approved by the regulatory body. Decommissioning plans have to be authorized by the State Office for Nuclear Safety. The licensee upon declaring the end of life of the nuclear installation is required to apply for a decommissioning license. Release from regulatory control following decommissioning or end of life is discussed in subchapter 9.6.

5.7. AUTHORIZATION OF TRANSPORT ACTIVITIES

The transport of radioactive material in the Czech Republic is well established and an appropriate governmental, legal and regulatory framework for the safety of transport of radioactive material is in place.

Transports are typically undertaken by road, rail and air modes as required. A summary of these transports is given in the Annual Report (SÚJB, 2012). Transport is undertaken in accordance with the IAEA Regulations for the Safe Transport of Radioactive Material (TS-R-1 2009) and the relevant Modal Instruments (ADR, RID, ICAO TI's etc. which are given effect to by the Ministry of Transport and Ministry of Foreign Affairs).

The regulatory responsibilities for the safety of the transport of radioactive material are primarily allocated to SÚJB through the Atomic Act, and as amended by a Decree detailing various areas (e.g. type-approval of packaging, ionizing radiation sources and shipment).

The Ministry of Transport has established SÚJB as the enforcement authority for class 7 transport by road and rail (ADR and RID). The Ministry of Foreign Affairs of the Czech Republic maintains up-to-date requirements of ADR and RID for road and rail transports of dangerous goods (including radioactive material) by issuing new Notifications every two years. These notifications contain English and Czech translations of Annexes A and B of the ADR agreement and Appendix C of the RID convention. For sea and air transports the general requirements are given in the appropriate modal regulations while the detailed requirements are stipulated in the current IMDG Code and ICAO-TI.

It is expected that the requirements of SSR-6 (2012) will be given effect in the revised ADR from 2014. In addition to the IAEA transport requirements approval is also required for nuclear material shipments and shipments of radioactive material with an activity greater than 3000A1 or 3000A2, as appropriate, or 1000TBq, whichever is the lower. The processing of approval applications is described in the Atomic Act and in an implementing Decree, on type-approval and shipment.

The work of SÚJB in the area of regulating transport of radioactive material among other items includes the assessment of applications and the associated technical documentation for licensing, assessment of applications and associated technical documentation for issuing of type approval certificates for packages type B(U), B(M) fissile material and Type S (for Storage), verification and validation of type approval certificates for different package types (Type IP-1, IP-2, IP-3, Type B(M), Type C, and fissile material), inspection of facilities and enforcement as required.

Assessments of package designs that do not require approval by the competent authority (such as Type A packages or industrial packages containing fissile-excepted radioactive material) are carried out by the appropriate organizations and the necessary evidence of such assessments is made available to the competent authority, if requested.

Prior to issuing an approval for a special arrangement shipment, SÚJB checks if all requirements stipulated in the Decree, on type-approval and shipment and also all requirements stated in the regulations which had not been met are replaced with special conditions (or technical or administrative) assuring that

that the level of nuclear and radiation safety and physical protection during the shipment is at an identical or higher level. Such conditions are subject to approval by SÚJB.

All aspects relevant for the safety of the shipment must be included in the documents submitted in approval request. The documents are reviewed according to the Atomic Act, implementing decrees and internal guidance. The process is regulated by Act No. 500/2004 Coll., Administrative Procedure Code. The SÚJB approvals are issued for up to 10 years.

5.8. SUMMARY

The authorization process for the regulation of nuclear installations, radioactive waste, ionising radiation sources and transportation is well established with a clear governmental, legal and regulatory framework, and an appropriate application of the graded approach.

SÚJB should consider strengthening the cooperation with the relevant competent authorities involved in the authorization process under the Construction Act. In addition, SÚJB should ensure that the regulatory criteria for the design and operation of operating and future NPPs are fully developed and take into consideration the safety requirements of the appropriate IAEA NPP safety standards. Concerning human resources, the systematic approach to analysing SÚJB's needs to address the siting assessment phase of new build was identified as a good practice.

For radiation sources, the SÚJB maintains a comprehensive and accurate regulatory data system for managing licensees and sources. To ensure up to date records, the SÚJB has made an arrangement through which the financial status of all licensees of radiation sources is regularly checked, this arrangement was also identified as a good practice.

To ensure that SÚJB has the knowledge and information to conduct review and assessment of the disposal of spent fuel, SÚJB should consider the arrangements for the development of independent research.

6. REVIEW AND ASSESSMENT

6.1. GENERIC ISSUES

Prior to the authorization of an activity and over its lifetime, SÚJB reviews and assesses relevant information to determine whether facilities and activities comply with the regulatory requirements. Evaluations are carried out at all lifecycle stages of a nuclear installation, as well as for transportation, radioactive waste and the use of radiation sources.

SÚJB carries out review and assessment for matters related to:

- 1) Nuclear power plants
- 2) Research Reactors
- 3) Fuel Cycle Facilities
- 4) Radioactive Waste Management Facilities
- 5) Radiation Sources
- 6) Transport
- 7) Decommissioning

SÚJB's assessments are based on the graded approach, and therefore adapted to the relevance of the safety issues. Among others, the amount and the level of detail demanded for applications depend on their impact on safety.

Formally, the process of review and assessment is defined in the Atomic Act. Even though there are time constraints set in the act, SÚJB has the possibility to suspend the process in case of a insufficient documentation and to send a request for additional information (RAI) to the applicant within a given time frame.

SÚJB frequently uses the support of technical organisations for the review and assessment of technical documentation. In that case, a specific contract is established to specify the expectations of SÚJB, and the support provided by the TSO is assessed at the end of the contract. In the field of nuclear safety, SÚJB is aiming at having a dedicated TSO established in Czech Republic, in order to have constant access to independent expertise for all technical areas related to nuclear safety. For radiation protection matters such arrangements already exist.

6.2. REVIEW AND ASSESSMENT FOR NUCLEAR POWER PLANTS

6.2.1. MANAGEMENT OF REVIEW AND ASSESSMENT

The goal of the review and assessment process is to establish the basis for a regulatory decision. This process is controlled by an internal procedure: Directive on Documentation Assessment. The extent of documentation necessary for the different cases is laid down on a general level in the Annexes of the Atomic Act. The time frame for the process is determined by the Administrative Proceedings Act and the Atomic Act. Depending on the category of the case this time frame may extend from 30 days to two years.

The Administrative proceedings are formally ruled by an Administrative Proceedings Act which sets general rules for the launch of proceedings (nature and type of the applicant, content of the application,

authority in charge of the authorization process), for the authority's proceedings (possibility to interrupt the process and request additional information) and the end of the authorization process (granting or rejection of the submittal).

SÚJB reviews and assesses the licensing documentation according to the requirements of the Atomic Act, such as OLCs, in-service inspections programme, QA programmes, security arrangements, on-site emergency plans etc.

Review and assessment is performed in the authorization phase of a nuclear power plant, and throughout the lifetime of an NPP (periodic safety review and modifications). The organisation applied at these two different moments differ one from the other:

- 1) Authorization of a facility licensing: an appendix of the Atomic Act gives a generic list of the required licensing documentation, the documentation that must be approved by SÚJB, as well as requirements for the content of the documentation. The vice chair of SÚJB is in charge of managing the proceedings. In case of bigger projects (e.g. siting of new NPP), teams comprising experts from the various necessary areas are appointed by an order of the chairperson or vice-chair. Thus, the team leader is clearly appointed, as well as the other team members and their respective responsibilities. That enables SÚJB to have a clear review and assessment plan for important assessment projects.
- 2) Change in a facility: the review and assessment of modifications is described in an internal instruction of SÚJB. Three categories of changes exist, depending on their potential impact on the safety of the NPPs, which ensures a graded approach. Depending on the category of a modification, the licensee may not be allowed to implement a change prior to SÚJB's approval.

Even though internal guidance exists on the review and assessment (e.g. for modification of a facility), the IRRS team considers that SÚJB's management system is currently missing some of the key processes and procedures for review and assessment. A lot of proceedings are plant- or issue-specific, and are not covered yet by internal procedures. Therefore, there is no assurance that assessments by two different employees of the same submission would result in the same decision by SÚJB in both cases. Additional internal guidance to which the reviewers could refer to for given technical areas would ensure stable and consistent decision-making.

The documentation, monitoring, tracking and quality assurance of the review and assessment process still leave room for improvement. For instance, SÚJB does not systematically document the justifications of its regulatory decisions: e.g., the decision whether to endorse or reject a recommendation suggested by a technical support organisation in the review and assessment process is not systematically documented.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| <p>Observation: SÚJB's management system is currently missing some of the key processes and procedures for review and assessment. For example the procedures in the management system do not currently address review and assessment in different technical areas and the monitoring of these reviews (e.g. document control system). Instead of having generic processes in the management system, SÚJB establishes project or plant specific procedures when needed. Having the processes described in the management systems ensures the stability, consistency and efficiency of the regulatory oversight. It also ensures objectivity in decision making of the regulatory body.</p> |
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RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (1) | <p>BASIS: GSR Part 1 Req. 22 states that <i>“The regulatory process shall be a formal process that is based on specified policies, principles and associated criteria, and that follows specified procedures as established in the management system. The process shall ensure the stability and consistency of regulatory control and shall prevent subjectivity in decision making by the individual staff members of the regulatory body. The regulatory body shall be able to justify its decisions if they are challenged. In connection with its reviews and assessments and its inspections, the regulatory body shall inform applicants of the objectives, principles and associated criteria for safety on which its requirements, judgements and decisions are based.”</i></p> |
| | <p>Recommendation of the IRRS Team related to this issue is given in item a) of the general Recommendation related to compliance with IAEA safety standard requirements at the end of Chapter 4.</p> |
| | <p>Observation: SÚJB does not systematically record and justify the decisions taken on the basis of reports provided by technical support organisations. For instance, SÚJB did not document the reasons for endorsing the recommendations of Řež’s report on the findings in the Belgian RPVs in Doel and Tihange.</p> |
| (1) | <p>BASIS: GSG-4 Para. 4.9 states that <i>“The regulatory body should document the decisions it has made on the basis of input from the external expert.”</i></p> |
| (2) | <p>BASIS: GSR-4 Para. 4.25 states that <i>“The decisions of the regulatory body shall be justified as appropriate, and the basis for the decisions shall be explained.”</i></p> |
| S9 | <p>Suggestion: SÚJB should consider documenting systematically the reasons that lead to rejecting or endorsing a recommendation of technical support organisations.</p> |

6.2.2. ORGANIZATION AND TECHNICAL RESOURCES FOR REVIEW AND ASSESSMENT

The manpower and knowledge management for review and assessment strongly depends on the technical areas and stages of the nuclear power plants. SÚJB has evaluated the needs of human resources and competences for the review and assessment in the licensing process in a comprehensive manner for Temelín 3/4 siting assessment phase (see chapter 5). The required human and financial resources have been granted by the government. However, the evaluation does not seem to have been performed as deeply for the review and safety assessment of currently operated NPPs. It has been mentioned to the IRRS team that half of the team in charge of review and assessment of operating NPPs has reached age of retirement (see suggestion in chapter 3 to evaluate the upcoming needs in that area).

Technical support:

When needed, SÚJB requires technical advice from TSOs e.g. Research Centre Řež. Research Centre Řež identified 8 staff members to provide support to SÚJB. This group works exclusively for SÚJB and is separated from the rest of the institute by what has been presented to the IRRS team as a “Chinese wall”: employees of this part of Research Centre Řež are not allowed to contract with the utility, or to get advice from other employees on a technical issue if those ones work or previously worked for the utility. SÚJB might consider turning to the international community to broaden its independent technical support, rather than using expertise from other experts from Research Centre Řež. Research Centre Řež has been created by Nuclear Research Institute Řež and links between these two institutes are explained in chapter 3.

The IRRS team has been told that in certain areas, SÚJB has to rely on the competence of external support organisations. In these cases, it should ensure that it has an adequate core competence to make informed decisions based on technical advice provided by the support organisation in a timely and comprehensive manner (e.g. findings in the Belgian RPVs in Doel and Tihange, discovered in August 2012).

Operational experience:

SÚJB has issued a regulatory guide about the reporting, investigation and root cause analysis obligations for NPP licensees in case of internal and external events. The whole process undertaken by the operator, which includes examination of root causes, remedial measures and feedback of experience, is provided by specific departments in the relevant NPPs and is described in relevant documentation. The NPP should analyse internal events and international events. Significant incidents that can be used by other operators are transferred by the operator into the WANO network, and experience regarding the most severe events is transmitted by the operator to all NPPs in the WANO network.

A team of SÚJB inspectors reviews the Operating Experience Feedback process, including the completeness of operators' reporting, the operators' screening of events, and the quality of the operators' root cause analyses. This process examines the progress of examination and assessment of sufficiency of remedial measures taken in the course of event management. The results of SÚJB evaluations of the Operating Experience Feedback process are documented in reports. SÚJB has its own database in which national events are recorded, and provides Czech input to the international IAEA/NEA incident reporting system (IRS).

SÚJB gets support from 2 external experts working at the Technical Universities of Pardubice and Bratislava. In addition, staff of SÚJB has been trained for root cause analysis. The IRRS team has not been able to assess whether this root cause analysis is indeed performed, and to which extent.

Tools used for review and assessment:

SÚJB has access to various internal or external (e.g. at Research Centre Rež) tools to review and assess submissions from the licensees.

Even though it is not required by the current regulation, SÚJB has issued a guide about the use of probabilistic analyses, complementary to deterministic analyses. SÚJB has access to the probabilistic safety analysis model designed by the utility CEZ and uses its results, for instance for assessing the temporary unavailability of equipment or by a modification in the facility. The IRRS team considers that in order to use this PSA for independent analyses, SÚJB has two options:

- keeping an independent assessment of the currently used PSA up to date
- developing an independent PSA-model

For both of these two options, the use of technical advice from the international community may be appropriate, considering that it might need significant human resources with a high knowledge of this specific field.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

Observation: For certain technical areas covering nuclear safety, the IRRS team was informed that SÚJB's use of external expert advice is sometimes limited, e.g. in the field of material science or probabilistic analyses. The IRRS team was informed that this may be due to financial limitations and time constraints.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (1) | BASIS: GSR Part 1 Req. 20 states that <i>“The regulatory body shall obtain technical or other expert professional advice or services as necessary in support of its regulatory functions.”</i> |
| S10 | Suggestion: SÚJB should consider developing further their use of expert advice to include technical support organisation from the international community. |
| | Observation: For certain technical areas covering nuclear safety (e.g. material science, pressurized equipment), the IRRS team was informed that SÚJB does not have enough internal resources to assess either the technical documents submitted by the licence-holder or the support provided by the TSO in a timely and comprehensive manner. |
| (1) | BASIS: GSR Part 1 Para. 4.22 states that <i>“The obtaining of advice and assistance does not relieve the regulatory body of its assigned responsibilities. The regulatory body shall have an adequate core competence to make informed decisions. In making decisions, the regulatory body shall have the necessary means to assess advice provided by advisory bodies and information submitted by authorized parties and applicants.”</i> |
| (2) | BASIS: GSG-4 Para. 4.6 states that <i>“The regulatory body should maintain its status as an intelligent customer for all work carried out on its behalf by external experts.”</i> |
| | This issue is covered by Suggestion S5 in section 3.3 and should be addressed in the actions taken in connection with this suggestion |
| | Observation: SÚJB is using the PSA results for Dukovany and Temelín in order to support its decision making. In the past, SÚJB contracted an independent assessment of the probabilistic safety analysis systems used by CEZ for Temelín and Dukovany. The independent assessment of the utility’s PSA has not been updated throughout the years in order to assess the adequate incorporation of the plant modifications and the new knowledge in the PSAs. |
| (1) | BASIS: GSR Part 1 Req. 21 states that <i>“The regulatory body has to carry out a separate independent verification to satisfy itself that the safety assessment is acceptable.”</i> |
| S11 | Suggestion: SÚJB should consider regularly, independently and comprehensively assessing the probabilistic safety analyses for nuclear power plants. |

6.2.3. BASES FOR REVIEW AND ASSESSMENT

The documentary bases on which the review and assessment are performed are clearly stated in the Atomic act. However, additional information can be required easily from the applicants by RAIs (Requests for additional information).

As for the technical bases, SÚJB has developed a number of guides for the safety assessment by the licensees, and by its own staff. These guides implement the safety objectives set in the “design decree” of 1999, and most of these guides are based on IAEA requirements and WENRA reference levels.

For some technical aspects, guidance has been developed even though there is no explicit legal basis for requiring such analyses from the licensee (e.g. probabilistic safety analysis, periodic safety review). On the other hand, there are certain technical areas that are not covered by a safety guide. It seems to the IRRS team that in these situations, consistency of the decision-making of SÚJB may not be ensured, the decisions relying mostly on the knowledge and experience of the SÚJB-employee performing the

assessment. A development and enhancement of the technical guidance in these areas (e.g. I&C) is therefore needed.

The fact that the “design decree” does not fully cover the requirements of the IAEA safety standards (SSR 2-1) has been addressed in chapter 5. This situation impacts the review and assessment process to the same extent as the authorization process.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: SÚJB does not provide, in regulations and their complementary guides, quantitative safety criteria for certain items important to safety of the NPPs (e.g. analysis of transients). Certain safety goals set in SÚJB regulations (e.g. design decree, siting decree) are not quantitative. This has the potential to lead to subjective decisions. |
| (1) | BASIS: GSR Part 1 Req. 32 states that <i>“The regulatory body shall establish or adopt regulations and guides to specify the principles, requirements and associated criteria for safety upon which its regulatory judgements, decisions and actions are based.”</i> |
| (2) | BASIS: GSR Part 4 Req. 16 states that <i>“Criteria for judging safety shall be defined for the safety analysis.”</i> |
| (3) | BASIS: GSR Part 1 Req. 22 states that <i>“The regulatory body shall ensure that regulatory control is stable and consistent.”</i> |
| S12 | Suggestion: SÚJB should consider increasing the coverage of safety relevant issues by regulatory guides complementary to regulations to provide quantitative criteria to allow for the assessment of all items important for nuclear safety. |

6.2.4. PERFORMANCE OF THE REVIEW AND ASSESSMENT

The SÚJB assesses the scope, the completeness and the compliance of submitted documents with the existing requirements. The responsibilities and deadlines of each area of assessment and evaluation are assigned to the relevant specialists by a Chair or Vice-chair Order case by case for important reviews.

SÚJB carries out regulatory oversight and holds meetings with the licensees whenever needed, to discuss objectives, and to understand safety relevant issues. For instance, regular meetings are organized with the management of the nuclear power plants on an agreed frequency, and the IRRS team was told by both the SÚJB and CEZ that various technical meetings and exchanges had taken place in order to finalize the scope of the periodic safety reviews that have been carried out on the Czech NPPs. In compliance with the Atomic Act, SÚJB has established commissions for the verification of the competence of selected personnel who might affect nuclear safety and radiation safety.

Reviews and assessments carried out by SÚJB sometimes lead to additional enforcement actions (e.g. review of the licensee’s in service inspection programme after findings on primary coolant pumps) and to amendments to authorizations (e.g. periodic safety review in Dukovany NPP).

A safety guide issued by SÚJB on the basis on WENRA reference levels gives guidance on the way to carry out the periodic safety review and on the expectations of SÚJB. This guide has been issued as a licence condition both for Dukovany and Temelín NPP. However, the requirement to perform these periodic safety reviews has not been stipulated in an act or a regulation.

The review and assessment of submitted technical documents seems to be done in a clear and thorough way, in compliance with requirement 4.45 of GSR Part 1, even though some improvements in the quality assurance can still be made (see previous sections). In some cases, independent calculations are currently not systematically made (see section 6.2.2. about PSA).

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: The legal basis for the regulatory body to require the licensee to conduct a periodic safety review has not been formally established. This deficiency is addressed operationally for nuclear power plants by attaching conditions to the licence for continued operation after the 10-yearly revision. |
| (1) | BASIS: GSR Part 1 Req. 25 states that <i>“The regulatory body shall review and assess relevant information [...]. This review and assessment of information shall be performed prior to authorization and again over the lifetime of the facility or the duration of the activity, as specified in regulations promulgated by the regulatory body or in the authorization.”</i> |
| R7 | Recommendation: SÚJB should develop binding regulation requiring the licensee to perform a periodic safety review of nuclear installations. |
| | Observation: The new build division of SÚJB has a very detailed chart tracking the on-going analysis of the initial preliminary safety report submitted by CEZ for the construction of Temelín units 3 and 4. It allows tracking of the decision basis for every single paragraph or statement of the submitted report, the regulatory basis used for the analysis of the statement, its result, and whether further documents or justifications are needed. The 700 pages of the report have been broken down into thousands of smaller units. |
| (1) | BASIS: GSG-1.2 Para. 2.5 states that <i>“The review and assessment of nuclear facilities necessitate considerable amounts of work and resources, and appropriate plans should be made for these. The regulatory body should develop a programme to review and assess information provided by the operator.”</i> |
| GP5 | Good Practice: SÚJB tracks the on-going assessment of CEZ’s initial preliminary safety report for Temelín 3/4 with a very detailed and systematic database tool, and justifies properly the assessment of every single statement of the report. |

6.3. REVIEW AND ASSESSMENT FOR RESEARCH REACTORS

The same divisions and personnel pool of SÚJB perform the review and assessment of the three currently operating research reactors and for the nuclear power plants. External experts from research institutes, universities, etc. are used. Since Research Centre in Řež is the licensee of two research reactors LVR-15 and LR-0 and a daughter company of NRI (Nuclear Research Institute) in Řež, the experts who are not directly involved in the project are used to avoid a possible conflict of interest.

According to the Atomic Act and Governmental Order 11/1999, the licensee of LVR-15 performed Level-I PSA (Probabilistic Safety Assessment) to demonstrate that the probability of a radiological accident is less than the allowable value and the designation of emergency planning zone (EPZ) is unnecessary. SÚJB required an update in 2009 as a pre-licensing condition for the next 10 years operation.

To directly address ageing issues, research reactors have been refurbished. After reviewing the updated documents reflecting the major design changes, SÚJB issued the operating licenses of LVR-15 through 2020, LR-0 through 2020, and VR-1 through 2017. Periodic safety reviews are not currently systematically performed for research reactors (see recommendation in Section 6.2.4). The licensees of research reactors are sharing information on aging with other countries through the IAEA RRADB (Research Reactor Ageing Database).

According to the internal guideline (VDMI 046), the impact of reconstruction and other changes on nuclear safety is assessed and categorized but a detailed procedure is needed to cover research reactors (e.g. assessment of experiments). Internal guidelines to address the specific areas of research reactor are not fully developed (see suggestion in Section 5.2).

The current legal framework contains provisions for various licensing phases of a research reactor but there are no regulatory requirements applicable for extended shutdown of research reactors. The framework to address the potential risk of extended shutdown should be established in a timely manner.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The current legal framework for research reactors contains provisions for various phases in the life-cycle of a research reactor, including siting, construction, commissioning, operation, and decommissioning. However, there are no regulatory requirements applicable for extended shutdown of research reactors. Taking into account that extended shutdown of research reactors may occur, such requirements are necessary for ensuring adequate regulatory control, including authorization, review and assessment and oversight. |
| (1) | BASIS: GSR Part 1 Req. 32 states that <i>“The regulatory body shall establish or adopt regulations and guides to specify the principles, requirements and associated criteria for safety upon which its regulatory judgements, decisions and actions are based.”</i> |
| (2) | BASIS: CoC on the Safety of Research Reactors Para. 20 states that <i>“The regulations and guidance established by the State or the regulatory body according to national arrangements should “(b) require the operating organization to prepare and maintain a safety analysis report and to obtain an authorization for siting, construction, commissioning, operation, modifications important to safety, extended shutdown and decommissioning; (t) where necessary in national circumstances, establish criteria for the safety of research reactors in extended shutdown.”</i> |
| S13 | Suggestion: SÚJB should consider preparing regulatory criteria for the safety of research reactors in extended shutdown. |

6.4. REVIEW AND ASSESSMENT FOR WASTE MANAGEMENT AND FUEL CYCLE FACILITIES

The processing, refining, conversion, enrichment, fabrication of fuel (including MOX fuel), spent fuel storage, spent fuel reprocessing, waste conditioning and storage, and fuel cycle research and development facilities are considered as fuel cycle facilities. Only spent fuel storage away from the reactor was considered under this section, the wet fuel storage at the reactor being covered by the NPP sections.

The safety case and its supporting safety assessment is the fundamental document used within the licensing process of any installation or facility regulated by SÚJB. The safety case including the safety assessment has to be submitted to SÚJB in a form of safety documentation as a part of the licensing process.

Different waste management facilities and activities are addressed in different ways. For example, NPPs predisposal waste management facilities are covered in the NPPs safety case while disposal facilities have their own safety cases.

Periodic safety reviews are not currently systematically performed for fuel cycle facilities (see recommendation in Section 6.2.4).

6.5. REVIEW AND ASSESSMENT FOR RADIATION SOURCES FACILITIES

SÚJB performs review and assessment of facilities and activities with radiation sources mainly during licensing. The information to be provided with an application is prescribed in the Atomic Act and further instructions on providing documentation demonstrating safety are provided in application forms. The information required depends on the type of practice and associated risks.

Review and assessment of the documentation demonstrating safety is usually done by SÚJB inspectors. However, in case of a more complex facility SÚJB may use Technical Supporting Organisations (TSO) to review and assess the technical information provided by the applicants. These TSOs include the Faculty of Nuclear Science and Physical Engineering of Czech Technical University, Faculty of Construction of the Technical University of Brno and the National Radiation Protection Institute, SÚRO.

The assessment is done against provisions in the Regulation on Radiation Protection (307/2002 Coll.) and a set of practice specific regulatory guides issued by SÚJB. However, limited internal guidance is available for SÚJB's inspectors to conduct review and assessment.

Periodic review and assessment is not required by SÚJB legislation. However, safety arrangements are regularly checked and verified during inspections. The IRRS team was informed that in case of complex practices, such as radiotherapy or use of accelerators, the quality management system is reviewed every one to two years and the emergency plan every three years. Other documents are reviewed whenever there is a change.

The results and decisions of reviews and assessments for each facility are registered in the SÚJB's archives.

6.6. REVIEW AND ASSESSMENT FOR DECOMMISSIONING ACTIVITIES

Atomic Act and the Decree 185/2003 Coll set the scope and method of decommissioning of nuclear installations or category III and IV workplaces. Documentation related to decommissioning has to consider the condition and history of the nuclear installation or workplace. The decommissioning plan, accompanied by a cost estimate, is updated on a 5 year cycle, and submitted for SÚJB for review.

The information required in the decommissioning plan is described in Section 8 of Decree 185/2003 Coll.

6.7. REVIEW AND ASSESSMENT FOR TRANSPORT ACTIVITIES

The national regulations for safe transport of radioactive materials are maintained up-to-date by the new Notification of the Ministry of Foreign Affairs of the Czech Republic every two years, which gives effect to the ADR and other modal instruments. Safety documentation submitted by an applicant is compared with legal requirements for the design of type-approval and shipment (Decree No. 317/2002 Coll).

Documents describing handling, storing and segregation of packages sufficiently from places occupied by transport workers and members of the public by consignors and carriers are a part of the documentation submitted to SÚJB by a consignor for a shipment approval (the Atomic Act).

The appointed inspector carries out the safety documentation assessment (including a comparison between described properties of the design and those prescribed) and prepares a draft of the type-approval if the safety documentation is satisfactory; otherwise a revised version is requested from the applicant. The assessment results are contained in the part "Reasons for the decision" of the draft approval. The head of Division of Radioactive Waste and Spent Fuel Management reviews the draft and modifies it as necessary and finally signs the Office Decision on type-approval as appropriate. Independent qualified experts / organizations such as relevant Faculties in the Czech Technical University of Prague and the

University of West Bohemia may also be appointed to assist the Office in reviewing the documentation. A review of the compliance assurance programme for type approving packages, special form radioactive material, shipments etc. confirmed that these are being implemented in practice administratively and supported by inspections as appropriate. SÚJB is provided with adequate resources to perform its functions in the area of review and assessment. Various guidance documents are available on the SÚJB website to assist the applicant with the process.

6.8. SUMMARY

It can be stated in general that the review and assessment activities at SÚJB are carried out at a high quality level, with a well implemented graded approach, e.g. with a very detailed tool to assess currently the initial preliminary safety report submitted for Temelín 3/4 identified as a good practice. An appropriate governmental, legal and regulatory framework with respect to review and assessment for the safety of nuclear installations and transport activities as well as for the management of radioactive waste and use of radiation sources is in place.

However, the current organisation and management system of SÚJB for review and assessment still leave room for improvement. In order to ensure consistency and stability in the decision making, additional internal guidance and criteria for judging safety should be defined, and the considerations on TSO inputs should be better documented. In addition, SÚJB should ensure that it maintains technical competences in all the areas in which it engages advice from external experts.

7. INSPECTION

7.1. GENERIC ISSUES

7.1.1. INSPECTION APPROACHES, METHODS AND PLANS

SÚJB carries out inspections to verify whether licensees and entities that perform activities regulated for nuclear and radiation safety comply with legislation and conditions specified in authorizations.

The verifications are carried out in the form of inspections by SÚJB inspectors whose rights and duties are determined by the Atomic Act and the Act on the State Inspection. Within the inspections, inspectors verify compliance of licensees and entities regulated for nuclear and radiation safety with requirements contained in the Atomic Act, implementing regulations and conditions specified in licenses.

The monitoring and assessment of nuclear and radiation safety in all nuclear installations and workplaces with ionizing radiation sources remains a priority. SÚJB fulfils this obligation through its planned and graded inspection programme. SÚJB formally presents the overall results of its inspection and assessment activities to the Government of the Czech Republic on an annual basis and publishes this annual report on its public website.

7.1.2. INSPECTION PROCESSES AND PRACTICES

SÚJB has a formal inspection programme that carries out its functions to ensure licensees comply with legislation, regulations and the terms of their specific licenses. It performs these activities as described in numerous programme documents and internal procedures, based upon the legislative authority under the Atomic Act. The programme covers all nuclear installations and areas, including research reactors, waste treatment facilities, contractors, as well as users of radiation sources.

All common inspection methods mentioned in IAEA GS-G-1.3 are utilized including monitoring, direct observation, discussions, reviews, examinations of procedures, records and documentation. Independent sampling, tests and measurements are conducted in the area of radiation protection and radioactive waste.

SÚJB has a systematic inspection planning and evaluation programme in place since 1996. Overall programme guidance is provided through internal agency documents VDS-008 and VDS-043, Planning, Execution, and Evaluation of Inspection Activities. Inspections performed by SÚJB are conducted in accordance with an inspection plan, which is prepared on a semi-annual basis. If trends in any of the inspected areas indicate increased risk, then more detailed or more frequent inspections are performed. The plans cover activities at Dukovany and Temelín Nuclear Power Plants, CEZ corporate level, research reactors, other nuclear installations, and facilities using radiation sources. The inspection plans are divided by functional areas that provide for inspections to the extent that they will provide sufficient information about the state of nuclear and radiation safety in the respective areas. The inspection frequency depends upon: 1.) the level of the impact on nuclear and radiation safety, 2.) any needs that may arise from feedback, 3.) an evaluation of the inspection of the specific area in the previous period, 4.) the fulfilment of obligatory conditions and requirements of the SÚJB, and 5.) the frequency and significance of activities performed by the inspected person in the given period.

SÚJB implements a graded approach in the conduct of its inspection programme, applying its inspection resources in a manner that is consistent with the safety significance of the regulated activity as well as the potential hazard to the public health and safety or the environment.

As a result of an internal self-assessment, SÚJB has initiated improvements to their inspection programme and planning process. These improvements include the development of long-term planning for the nuclear installation inspection programme for a period longer than six months and adding specific areas for inspection delineated in IAEA GS-G-1.3 Appendix for the Operational Phase, which are not fully covered in the current inspection programme.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: While implementing a systematic inspection planning and evaluation programme, the SÚJB inspection programme for nuclear facilities does not cover all aspects of inspections delineated in GS-G-1.3. Examples of these areas include the development of inspection procedures for the oversight of licensee external OEF process review and evaluation, and for the inspection of authorized persons responsible for the assessment of technical safety regarding classified safety equipment. |
| (1) | BASIS: GSR Part 1 Para. 4.50 states that <i>“The regulatory body... shall stipulate... the areas and programmes to be inspected.”</i> |
| (2) | BASIS: GS-G 1.3 Appendix for Inspection Areas for Nuclear Facilities A.17 states that <i>“for all facilities, inspections should cover the aspects detailed in paragraphs A.18-A.41.”</i> |
| S14 | Suggestion: SÚJB should consider verifying that the inspection programme and related inspector training for nuclear facilities address the applicable inspection areas and aspects for each stage of the authorization process delineated in GS-G 1.3. |

A formal SÚJB documented and signed announcement of the initiation of an inspection is presented to the operator. Upon completion, an exit meeting with the licensee management is conducted to present the results of an inspection. Inspections are documented in reports which contain the identification data of the legal entity or person being inspected, a list of inspectors and invited persons as applicable, the scope of the inspection, the programme of the inspection, the place and time of the inspection and its progress, the findings, and if any, the imposed requirements in accordance with the Act on Inspection. The final report serves to present the formal inspection results to the operator.

Regarding transparency, inspection reports and enforcement actions are provided to the public or external parties upon receipt of a formal request, and SÚJB’s response to such inquiries are based upon the government’s Freedom of Information Act.

7.1.3 INSPECTORS

SÚJB utilizes 50 inspectors to implement its inspection programme at nuclear installations and 40 inspectors at facilities and activities with radiation sources. SÚJB has 12 resident inspectors at their two nuclear power plants (operating six reactors) and performs approximately 200 inspections per year at each of these facilities. The number of inspections at facilities and activities with radiation sources is approximately 1,000 per year, of which about 70% are conducted by regional inspectors. Most of them are announced, but some unannounced are conducted. All SÚJB inspectors are assigned responsibilities involving inspection, review and licensing activities.

Currently, SÚJB resident inspectors spend approximately 80% of their time in direct inspection, inspection preparation and documentation. The remaining 20% of their time is spent in review activities, such as the assessment of plant modifications. SÚJB concludes that the use of inspectors in the review of modifications and licensing activities enhances the inspectors’ effectiveness in overseeing their related implementation and construction. SÚJB has recently initiated a plan to enhance the clarity in the

separation of the roles and responsibilities for resident and system specialist inspectors. All inspections are carried out directly by SÚJB inspectors and cannot be delegated.

To ensure effective implementation of the inspection programme and enable the identification of significant safety issues, SÚJB emphasizes the training and qualification of its inspectors. The competence of inspectors is achieved through a formal training programme developed in compliance with internal procedures within the SÚJB Employee Training and Evaluation System VDS 039/2001 (rev. 2013). In accordance with requirements, inspectors must be university educated, have at least 3 years of professional experience, and must pass a formal internal examination. The inspector's training is concluded with an inspector examination before an SÚJB internal commission.

An inspector refreshment training programme is in place, and every inspector has an individual plan of specialized training, which includes on-the-job training for inspectors, knowledge of Czech and EU legislations, SÚJB competencies, facilities and activities being regulated, internal SÚJB processes and procedures, and other specific office skills. The observance of individual inspector plans and specialized training is periodically evaluated, and the implementation of the training programme is followed closely by the individual inspector's supervisor.

There is no formally established rotation for SÚJB staff assigned to the Dukovany, Temelín and Headquarters. However, the resident inspectors infrequently participate in routine inspections other than their permanently assigned site. The IRRS Team noted that the resident inspectors at Dukovany are assigned to specific units and that the extent of cross coverage could be enhanced, as well as the presence of inspectors at NPPs during non-routine working hours at times other than unit outages. SÚJB applies several tools to harmonize the activities of the inspection staff including standardized procedures, inspection report templates, periodic observation of the inspectors by management, and the Committee for Evaluation of Inspections (CEI) described in section 7.2.

7.2. INSPECTION OF NUCLEAR POWER PLANTS

The IRRS Team visited the Dukovany Nuclear Power Plant and met with plant management and the resident inspection staff. The team observed the resident inspectors participation in the morning videoconference with the Temelín resident inspectors, related regional radiation protection centres, and SÚJB HQ management. The IRRS Team considered the videoconference call a highly effective means to communicate operator events and issues, as well as integrate information and planned regulatory activities.

The resident inspectors described their detailed inspection planning and guidance. The inspector also displayed SÚJB's various tools for maintaining their cognizance of the operator's activities and plant status. Among the tools, the residents highlighted their online access to digital daily logs of the shift supervisor, control room staff, and field operators which provides further detailed and timely information.

The IRRS Team observed the senior resident and one of the other six resident inspectors conduct their walk-downs of the control room, emergency control room, emergency feedwater system, and diesel generator station. These observations included the resident inspector's performance of a specific detailed inspection and verification of the readiness and safety status of the emergency feedwater system and emergency diesel generator. The IRRS Team was also able to observe a portion of the ongoing plant modifications in accordance with the National Action Plan for Fukushima, and discuss these enhancements to plant safety systems and procedures with the resident staff and plant management.

Regarding the oversight of inspections, and the assessment of licensee performance and SÚJB regulatory processes, every inspection report includes the documentation of operator performance assessment. An assessment document serves to classify the severity of the findings, which are integrated into an overall

performance assessment for each report. The assessment of each inspection report is then integrated into an overall performance assessment of the operator over the six-month period. In addition, a separate evaluation document allows inspectors to present proposals for improvements to the SÚJB inspection, assessment and overall regulatory activities.

Approximately every month, a meeting is held during which inspections completed during the past month are evaluated, results are discussed by inspection staff and SÚJB management, and, if applicable, further actions or process enhancements are proposed. These steps may concern all of the regulatory activities (i.e., assessment, licensing, or legislative) of the SÚJB. SÚJB has established a formal inspection programme assessment process overseen by the CEI that reviews each inspection report and its related findings, as well as identifying and implementing inspection programme and other SÚJB internal process improvements that may be warranted. This review includes a statistical and qualitative assessment of the findings during the assessment period and safety performance indicators for nuclear power plants. Examples of regulatory improvements resulting from the CEI process include the recent development of proposed revisions of decrees enhancing SÚJB authority and operations in support of its mission. Another regulatory improvement includes an issuance of a Vice Chair order for the review of nuclear power plant safety system component modifications. Other examples involving regulatory actions include the decision to conduct a reactive inspection at an installation.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: SÚJB has established an inspection programme assessment process overseen by the Committee for Evaluation of Inspections (CEI) that reviews each inspection report and its related findings. The Committee also identifies and implements inspection programme and other SÚJB internal process improvements that may be warranted. This review includes a statistical and qualitative assessment of the findings during the assessment period and safety performance indicators. |
| (1) | BASIS: GSR Part 1 Req. 27 Para.4.51 states that <i>“The regulatory body shall record the results of inspections and shall take appropriate action (including enforcement actions as necessary). Results of inspections shall be used as feedback information for the regulatory process and shall be provided to the authorized party.”</i> |
| GP6 | Good Practice: The representation of SÚJB management in the SÚJB Committee for the Evaluation of Inspections provides an effective methodology for the assessment of licensee performance and overall regulatory programme feedback. |

SÚJB has also implemented a new safety culture assessment process that has recently been incorporated into the nuclear power plant inspection programme and procedures. The assessment process is based on established international research in human organizational development and assessment. The process includes periodic evaluation of eight specific safety culture characteristics and uses a highly detailed methodology for evaluation. SÚJB has completed formal training for their inspection staff in this important area. SÚJB has also communicated its expectations and the evaluation methodology to nuclear power plant operators and has initiated the communication of the programme’s results. This was affirmed during the IRRS team’s visit with Dukovany plant management and site resident inspectors.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: SÚJB has developed and initiated a new programme to assess the safety culture of nuclear power plant operators via a specific internal procedure prescribing the conduct of inspections and evaluations focused on this area. Related inspector training has been completed. |
| (1) | BASIS: GSR Part 1 Req. 29 Para.4.53 states that <i>“In conducting inspections, the regulatory body shall consider a number of aspects, including...safety culture...”</i> |
| GP7 | Good Practice: Nuclear power plant operator safety culture is inspected, evaluated, documented and reported to utilities in systematic and comprehensive manner. |

In addition to core inspections, SÚJB reactive inspections are performed at nuclear installations when necessary. The majority of these reactive inspections investigate the adequacy of established root causes, the completeness of corrective measures, licensee progress in the adoption of corrective measures, and the quality of event investigation records. The methodology for implementing a reactive inspection is described in VDS008, which includes the general inspection planning rules that apply. A decision on conducting a reactive inspection can be made by office management, based upon daily information regarding NPP operations during well-coordinated video conferences with resident and radiation protection inspectors and other discussions of related SÚJB activities at periodic management meetings. In addition, a decision on performing a reactive inspection can also be made at the CEI.

During discussions with SÚJB it was noted that inspectors rarely exercise the right to conduct an unannounced inspection during non-routine working hours and that the planning for such unannounced inspections is not formalized. It was also noted that SÚJB resident inspectors do not respond to the NPP site when an emergency arises. The response of the inspectors during a radiation accident is neither expected nor directed by SÚJB management. This fact seems inconsistent with SÚJB’s legislative authority and regulatory oversight responsibilities.

In addition, while SÚJB does not currently direct inspectors to the site during an emergency, there are sufficient legal arrangements to assure their presence onsite should SÚJB determine such a need. The IRRS Team concludes that the presence of the resident inspectors at the site during an emergency substantially enhances SÚJB’s direct independent oversight, as well as its credibility with the public at these times. This issue is discussed further in section 10.2.

7.3. INSPECTION OF RESEARCH REACTORS

The inspection types applied regularly for research reactors are identical to those for nuclear power plants except daily inspection. SÚJB does not send resident inspectors to the research reactor site and daily inspections are not performed.

The inspection plan which is prepared semi-annually by the nuclear safety and radiation protection departments and the emergency response centre includes the inspection plan for research reactors. Inspections are carried out to evaluate the safety of research reactors in the areas including operation, maintenance, technical and engineering support, radiation protection, transport of nuclear materials, physical protection, emergency preparedness and quality assurance.

Periodic inspections are performed every year at LVR-15, and every two years at both LR-0 and VR-1. At research reactors, one or two inspectors participate in the periodic inspections.

Quality Assurance inspection is performed as one of the inspection items during the periodic inspection for research reactors. Pre-operational inspections are carried out before the issuance of licenses for operation, refurbishment and other changes impacting on the safety of research reactors.

SÚJB is also evaluating the potential implementation of a Safety Culture Assessment Process at research reactors that is already incorporated into nuclear power plant inspection procedures.

7.4. INSPECTION OF FUEL CYCLE AND WASTE MANAGEMENT FACILITIES

Inspections of processing facilities for radioactive waste, the LILW disposal facility and AFR spent nuclear fuel storage facilities are conducted typically twice per year. The Operating Limits and Conditions are used as a form of checklist for conducting the inspections. Inspection reports are documented and filed. They are used for subsequent inspections in order to follow-up on issues.

The IRRS team visited the Dukovany site where the bituminization of liquid waste, the AFR spent fuel storage facility and the LILW disposal facility are located. The operators provided access to the Operating Limits and Conditions which are used to manage the facilities.

7.5. INSPECTION OF RADIATION SOURCES FACILITIES

The general procedure of inspection is prescribed in the SÚJB internal guide VDS 043 Planning, preparation, implementation and evaluation of inspection activity - Radiation Protection Section. A comprehensive set of more detailed practice specific guidance on inspection methodologies are given in VDMI-series internal documents. These documents include practice-specific check lists for inspections.

Practice-specific inspection frequencies have been established based on associated risks. Inspection results are evaluated with a three-level grading: Level 1: no significant non-compliance; Level 2: some findings, but not important for the risk of health; and Level 3: serious non-compliance. The Level is recorded in the regulatory information system allowing for the analysis of inspection outcomes. Important inspection findings and the development or amending the inspection plans are regularly discussed by Inspection Evaluation Teams comprising inspectors from different regional offices.

An inspection report is prepared after the inspection using a standard template. The report should be sent to the licensee within 30 days after the completion of the inspection.

Some members of the IRRS team accompanied two inspectors from SÚJB to inspect the Radiotherapy Department of Faculty Hospital Motol. The Department is equipped with 3 Linear Accelerators for cancer treatment. The inspection included areas such as checking safety documents required by SÚJB (such as calibration certificates, results of the quality audits, emergency plans, and personnel dose records), radiation protection officer training, safety of systems and radiation signs. The inspection started with an interview with the radiation safety officer and the medical physicist. Related documents and records were checked by the inspector. The inspectors then proceeded to the locations where the linear accelerators are housed to conduct visual inspections of the radiation signs in each bunker. Following the observation, an exit briefing was conducted with the radiation protection officer of the facility and findings of the inspection were presented and discussed.

The IRRS team also monitored the conduct of an inspection to Dekra Industrial Ltd, Hradec Kralove. The facility is equipped with Ir-192, Cs-137 and Se-75 radioactive sources and x-ray machines used in industrial radiography activities. The inspection started with a round table discussion with the radiation safety officer (the Manager of the facility) and the relevant staff. The inspection started by checking the documentation on the conduct of the practice. The inspectors then proceeded to the locations where sources were stored to conduct visual inspections of the sources. The inspector conducted a few dose-rate

measurements to verify the presence of sources. The overall number of source containers with sources was verified; however individual identification of source containers was not made. An exit briefing was conducted with the radiation protection officer of the facility and findings of the inspection were presented and discussed.

Further, some members of the IRRS team accompanied two inspectors from SÚJB to inspect the Interventional Cardiology Department of the IKEM Hospital. The inspection included inspection of personnel records (such as training activities, examination results on radiation protection, classification and dose records), delineation and characterization of the areas, optimization issues (such as diagnostic reference levels and procedures). The inspection started with an interview with the Head of the Department and continued with an interview with the Medical Physicists in Charge. Related documents and records were checked by the inspector. The fulfilment of the license conditions was also verified. The inspectors then proceeded by conducting visual inspections of the radiation signs, the protective equipment and the personal dosimeters. Finally, they observed the performance of the radiological procedures in operation at that time. An exit briefing was conducted, during which the findings of the inspection were presented and discussed.

In all inspections, check lists were followed systematically by the inspector. The Team noticed that the main part of the inspections was on checking the documentation on the conduct of the practice and less time was allocated to on-site observations. The inspectors of SÚJB conducted the inspections in a professional manner. Clear and open communication with the radiation safety officer and other facility staff were observed by the IRRS team.

7.6. INSPECTION OF DECOMMISSIONING ACTIVITIES

There are currently no decommissioning projects underway at nuclear installations or Category III or IV workplaces in the Czech Republic except for uranium mines and mills. However, decommissioning is underway at Category I and II workplaces. These workplaces are routinely inspected.

7.7. INSPECTION OF TRANSPORT ACTIVITIES

Transport inspections are planned, performed and assessed in compliance with the Atomic Act and implementing Decree No. 317/2002 Coll., on type-approval, shipment and internal guide VDMI 019/2001: Inspection manual for compliance checking of the shipment of nuclear materials and radionuclide emitters. The scope and frequency of the regulatory inspections corresponds to the potential risks posed by the shipment. All planned inspections are focused on the compliance of the shipment with the relevant provisions of the Decree No. 317/2002 Coll., on type-approval and shipment (and with the requirements of appropriate approval certificate). Reactive inspections are performed only if an abnormal occurrence requires immediate investigation or if there are concerns about the licensee's capability to perform any corrective actions in the event of an incident.

In 2012, SÚJB carried out 10 inspections of the transport of nuclear materials and radioactive substances. They included inspections of international transports of fresh nuclear fuel for the two nuclear power plants and inspections of the international transport of uranium concentrate and irradiated nuclear materials. SÚJB also inspects packages of foreign origin while in transit in its area of jurisdiction. A similar number of inspections have been taken up to November 2013 with similar results.

The compliance assurance programme of SÚJB includes the monitoring of handling and stowage of packages by consignors and carriers. Documents describing handling and stowage of packages by consignors and carriers are a part of the documentation submitted to the SÚJB by a consignor for shipment approval. The relevant aspects of these (e.g. radiation protection during transport (including

dosimetry arrangements), emergency preparedness, physical protection arrangements, driver competence/training, stowage during carriage, segregation, verification of transport documents, etc.) are inspected by the SÚJB staff accompanying the shipment to see if they are in accordance with the legal requirements.

SÚJB ensures through inspections that the requirements for all modes of transport have been met in practice. Upon completion of the inspection, SÚJB provides the user's management with a summary of the results of the inspection, including any non-compliances noted. The inspection report is issued in a standard format known as the 'Protocol'. The Office keeps track of inspection findings as evidence of compliance and retains all official written materials concerning inspections for 15 years.

The SÚJB performs inspections, auditing and/or reviews of the management system established by the operator as well as checking the appropriate quality assurance programme. The audit is governed by internal guides VDS 080/2013 Quality systems assessment and VDMI 020/2001 Inspection manual for quality checking of packaging manufacturing. In the Czech Republic, there are two specialized manufacturers of packaging (UJP Praha and SKODA JS). The SÚJB performs inspections of the manufacturing activities and of the activities in the management system. The results of such inspections are recorded and communicated to the manufacturer.

A similar situation exists for the only testing facility in the Czech Republic (SÚRAO). Following the upgrade of the testing facility during 2005-2006 SÚJB conducted inspections including witnessing the tests and checked that the tests were carried out in accordance with the quality management system. On the basis of the inspection, the testing facility was approved to resume package testing. The results of such inspections are recorded and communicated to the testing facility management. While these inspections have been undertaken, the frequency of these would not be considered optimum, given the current staffing levels and administrative burden on the transport staff.

If an inspection reveals an unsatisfactory situation or a non-compliance, SÚJB follows up to determine the cause of the problem and initiates suitable action to prevent its recurrence (including additional education and training). Penalties for violation of a legal obligation are established under the Atomic Act. The inspection and enforcement programmes are applied to all activities that are important to safety irrespective of whether an approval certificate is required or not.

SÚJB is provided with resources to perform its compliance assurance programme for conducting inspections in the nuclear sector; however these resources in terms of staffing could be augmented. Inspections are undertaken throughout the country. The findings and lessons learned are analysed at regular meetings of the inspection assessment Commission and the results of the assessment are published in the Annual Report of the State Office for Nuclear Safety (see recommendation in Chapter 3.3).

The transport of radioactive material in the Czech Republic is well established and an appropriate governmental, legal and regulatory framework with respect to inspection functions for the safety of transport of radioactive material is in place. However, noting the current complement of two inspectors (one being trained) and the age profile in the Division of Radioactive Waste and Spent Fuel Management specializing in the work associated with the transport sector (review and assessment, issuing approvals, undertaking inspections, witnessing testing etc.) and the administrative burden associated with the implementation of existing EC Directives and the development of new ones, performing necessary regulatory functions and activities poses a constant challenge.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: Noting the current complement of two inspectors (one being trained) and the age profile in the Division of Radioactive Waste and Spent Fuel Management specializing in the work associated with the transport sector (review and assessment, issuing approvals, undertaking inspections, etc.) and the administrative burden associated with the implementation of existing EC Directives and the development of new ones, performing necessary regulatory functions and activities poses a constant challenge.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 18 states that <i>“The regulatory body shall employ a sufficient number of qualified and competent staff, commensurate with the nature and the number of facilities and activities to be regulated, to perform its functions and to discharge its responsibilities.”</i></p> |
| S15 | <p>Suggestion: SÚJB should consider more comprehensive and frequent training for regional inspectors undertaking inspections of the transport of radioactive material.</p> |

7.8. SUMMARY

SÚJB has a formal, graded inspection programme that carries out its functions to ensure its licensees and radiological facilities comply with legislation, regulations and the terms of their licenses.

While some improvement to the programmes can be made, the inspection process is utilized and documented in a structured and appropriate manner. SÚJB has self-initiated an action plan to ensure the programme covers all aspects of related IAEA guidance.

The IRRS team considered the inspectors observed to be trained, competent, and respected by their regulated entities. They conducted their inspections in accordance with internal procedures. The IRRS team considered the Committee for Evaluation of Inspections (CEI) that reviews each inspection report and its related findings as a good practice, as well as SÚJB’s new programme to assess nuclear power plant operator safety culture.

The IRRS Team noted that inspectors rarely exercise the right to conduct an unannounced inspection during non-routine working hours and that the planning for such unannounced inspections is not formalized. It was also noted that SÚJB resident inspectors are not directed to respond to the NPP site when an emergency arises or participate as a member of the SÚJB emergency response team.

The IRRS team acknowledges that SÚJB inspection practices are in line with the IAEA requirements. There is room for improvement and the suggestions and recommendations provided by the IRRS team are aimed to optimize the existing inspection process implemented by SÚJB.

8. ENFORCEMENT

8.1. ENFORCEMENT POLICY AND PROCESSES

SÚJB is empowered to impose corrective measures and enforce their adoption, including sanctions in case of failure to observe the measures, by the Atomic Act. The enforcement process is formally established by the Code of Administrative Procedure. Internal procedures and guidance include SÚJB VDS029 “Guideline on the administrative procedure of imposing penalties.”

SÚJB can take the following enforcement actions depending on the significance of the non-compliance identified:

- a) Demand from the licensee/applicant to rectify the situation in a prescribed time period.
- b) Impose the duty to carry out technical inspections, revisions, or tests of operational capability of equipment, components or systems, if necessary in order to verify nuclear safety, radiation protection, emergency preparedness and further monitoring and interventions in order to reduce or eliminated continuous radiation.
- c) Revoke a certificate of special qualification of a licensee/applicant's employee who has substantially infringed its duties or who does not satisfy professional, physical or mental requirements.
- d) Impose a fine.
- e) If there is a danger due to delay, or in case of an occurrence of undesirable facts important from the point of view of nuclear safety, radiation protection, physical protection, and emergency preparedness, the SÚJB can issue a decision on a preliminary measure. Measures imposed under the Atomic Act are imposed in accordance with the Code of Administrative Procedure.

The Atomic Act also provides SÚJB with the authority to amend or revoke a license issued if it is found that the conditions under which it was issued are no longer complied with or serious violations of nuclear safety or the radiation protection rules have occurred.

SÚJB imposes corrective measures in accordance with the Atomic Act and the Code of Administrative Procedure. Inspectors are empowered to demand a submission of information in writing on elimination of deficiencies found within an inspection based on the Act on Inspection.

As a result of their own self-assessment, SÚJB has identified that internal SÚJB procedures do not appear to identify methods that would provide for commensurability between enforcement actions and the gravity of the non-compliance. To address this issue, SÚJB is initiating new legislation to provide a detailed scale of penalties as part of its Action Plan. The Atomic Act amendment is planned to contain a detailed passage on penalties to ensure the penalties are commensurate with the gravity of non-compliance and the action.

In the IRRS Team’s review of the various areas of enforcement, it was noted that while there are many tools prescribed in the legislation and SÚJB’s internal guidance for the practical application of enforcement, SÚJB has not established an overall policy for enforcement.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: Although the Atomic Act provides SÚJB the authority to impose penalties and SÚJB implements this provision in accordance with internal procedures, existing legislative authority does not authorize a methodology enabling SÚJB to impose penalties commensurate with the severity of the non-compliances. |
| (1) | BASIS: GSR Part 1 Req. 31 Para 4.54 states that <i>“The response of the regulatory body to non-compliances with regulatory requirements or with any conditions specified in the authorization shall be commensurate with the significance for safety of the non-compliance, in accordance with a graded approach.”</i> |
| R8 | Recommendation: SÚJB should finalize efforts to revise the Atomic Act to provide a detailed scale of penalties for nonconformities commensurate with their severity. |
| | Observation: While different tools for enforcement are prescribed in the legislation and there is some internal guidance for their practical application, the SÚJB has not established an overall policy for enforcement. |
| (1) | BASIS: GSR Part 1 Req. 30 states that <i>“The regulatory body shall establish and implement an enforcement policy within the legal framework for responding to non-compliance by authorized parties with regulatory requirements or with any conditions specified in the authorization.”</i> |
| R9 | Recommendation: SÚJB should establish and implement a comprehensive enforcement policy that takes into account all regulated activities, existing legal requirements and internal documents. |

8.2. ENFORCEMENT IMPLEMENTATIONS

Regarding the implementation of enforcement, SÚJB and their inspectors' rights are given by the Atomic Act and the Act on Inspection described above. In general, inspectors are empowered to demand the elimination of findings.

In practice, SÚJB can take appropriate enforcement actions for the elimination of non-compliances through the following actions:

- verbal or written warning by the inspector in the course of inspection;
- imposing remedial measures in the inspection report;
- discussion with the operator, including meeting minutes containing requirements;
- a letter from the SÚJB Chairman or vice-chairs as the case may be, ordaining to eliminate the non-compliance;
- impose remedial measures by decision within an administrative procedure;
- an administrative procedure concerning a penalty;
- imposing to reduce the output power or shut down the unit;
- in the case of licensing a new unit, rejection of application for the license.

SÚJB can take appropriate enforcement actions in situations where an immediate health, safety, or security concern has been identified in accordance with VDS037, Directive on Inspection Activities. If inspectors find a serious non-compliance and there is a threat to humans or the environment, the

inspectors are expected to provide a warning to the inspected person and are required to inform senior SÚJB management.

For nuclear facilities, SÚJB issues findings and/or warnings when violations are found. In each case, the finding and/or warning identifies the nature and importance of each violation. The finding and/or warning specify a period of time to implement remedial actions. The information about implementation of remedial measures is provided by the licensee to SÚJB. SÚJB evaluates the response and, if the nature of finding demands, the effect of the implementation of the measures is verified at the NPP. The compliance with requirements stipulated in reports is tracked by the Committee for the Evaluation of Inspections (CEI) which determines a date by which the inspector is required to inform SÚJB management about the completion in accordance with VDS008, Planning, Execution, and Evaluation of Inspection Activities. In determining a reasonable period of time for completion of corrective actions, SÚJB considers the following:

- the significance of deficiency and its influence on nuclear safety
- the possibilities to temporarily compensate for the deficiency by substitute measures
- the complexity of action, that is necessary to implement, in particular if there are large equipment modifications (unless there is a danger in delay, quality is preferred over timeliness)

The fulfilment of prescribed requirements and the date of completion are verified. The inspected person shall transmit to SÚJB information about its fulfilment of remedial measures in writing. The inspector verifies the fulfilment of remedial measures upon the expiration of the specified period. The step of acceptance of a solution may include the verification of the implementation of remedial measures. Findings within the verification are usually solved during the verification, and a record is made in the verification report. If the inspected person fails to fulfil a requirement within the verification, the inspector makes a record in the inspection report which is assessed for further enforcement, and continues to monitor the progress.

For facilities and activities with radiation sources, usually the order to correct observed non-compliances is issued in an inspection report. The operator of the facility or activity shall provide a written answer on the method of problem resolution, along with the timeline. If SÚJB does not accept the proposal, a decision will be made on the appropriate actions and timeline. The fulfilment of the corrective action is verified either by a separate inspection (in case of Level 3 findings) or during the next regular inspection (Level 2 findings).

As noted in Section 8.1, the IRRS Team's noted that SÚJB has not established an overall policy for enforcement incorporating the various tools and guidance that is available. There is no fully formalized procedure for the assessment for corrective action timeliness. In addition, SÚJB's practices to enforce the elimination of non-compliances include the use of verbal (or written) warnings by the inspector in the course of inspection. SÚJB has not established or documented criteria or a threshold describing when inspectors' findings must be recorded. Documented criteria would institute a threshold for verbal warnings to ensure inspectors' findings are documented and assessed in a transparent and consistent manner throughout the programme.

In its own self-assessment, SÚJB identified the fact that certain SÚJB findings are being identified again, despite the fact that an order had been issued to rectify the situation. SÚJB has initiated an action to enhance their systematic tracking and evaluation of the fulfilment of licensees' remedial measures to prevent from recurrence of findings and ensure effective corrective action.

8.3. SUMMARY

SÚJB is empowered by the Atomic Act to impose corrective measures and enforce their adoption, including sanctions and the revocation of licenses and certificates. SÚJB's enforcement process includes diverse and graded tools, however the IRRS Team observed that SÚJB should establish a comprehensive policy for enforcement.

Regarding nuclear facilities, SÚJB has initiated an action to enhance their systematic tracking and evaluation of the fulfilment of licensees' corrective actions and has self-identified a need and means to provide for commensurability between enforcement actions and the gravity of non-compliances.

The IRRS Team noted that there is no fully formalized procedure for the assessment of the timeliness of corrective action implementation and that SÚJB's enforcement practices allow for unrecorded verbal warnings by inspectors without established criteria.

9. REGULATIONS AND GUIDES

9.1. GENERIC ISSUES

The Czech Republic has a comprehensive legislative framework in place. This framework consists mainly of three levels:

- Acts (Constitution, Conventions and Laws (mainly the Atomic Act))
- Regulations (Decrees and Government Orders)
- Regulatory Guides (mainly SÚJB Guides)

As a member of the EU, the Czech Republic conforms to EU legislation. EU Commission and Council regulations are directly obligatory. EU-Directives have to be transposed into the national legislative framework. Most of the amendments of the Atomic Act were related to Council directives or Council orders.

Acts, Decrees and Government Orders are legally binding. Guides are not legally binding but they contain guidance for the licensees on how to act in accordance with laws and decrees. SÚJB Guides are available for nuclear safety and for radiation protection. In the past it was a declared strategy from SÚJB that the focus for guides should be on the field of radiation protection. In the field of nuclear safety it was the expectation of SÚJB that the licensee himself should come up with adequate proposals.

A complete list of all acts, degrees, government orders and SÚJB guides is available on the SÚJB website.

The current Atomic Act was issued in 1997. Main contents are:

- Scope of the Act
- Clear description of the Competence of SÚJB
- Regulations for Expertise Fees
- General conditions for Performance of Practices
- Conditions for nuclear Energy and ionising radiation utilisation
- Regulations for radioactive waste management
- Regulations for civil liability for nuclear damage
- Regulations for state supervision and penalties
- General, temporary and final provisions

In the Atomic Act main stages of the radiation utilisation are addressed (siting, construction, commissioning, operation, reconstruction and decommissioning). The Atomic Act is executed via a system of decrees. The IRRS team has concluded that the approach provided by the Atomic Act provides for a graded approach.

New Atomic Act

SÚJB had started an intensive project to prepare a new Atomic Act and its corresponding implementing decrees. The objective of SÚJB is to implement the latest knowledge and experience from regulatory practice. The focus of SÚJB was to implement

- EU legislation
- WENRA Recommendations
- ICRP 103
- IAEA Safety Standard GSR-Part 3
- New safety regulation on protection of population, workers and the environment

The new Atomic Act including the related decrees was drafted and sent to the intra-governmental consultation process according to the Czech legislative rules. There is also a requirement for an assessment of regulatory impacts (RIA). The new Atomic Act should come into force in July 2015.

The draft contents of the new Atomic Act were presented to the IRRS-Team. The IRRS Team cross-referenced the contents of the new Atomic Act versus the above-noted points and concluded

- that the new Act contains all the necessary legal provisions to allow SÚJB to discharge its mandate
- there are authorizations given to SÚJB to issue decrees as required. This is considered by the IRRS Team to be a reasonable strategy.
- the prime responsibility for the licensee is fixed in the new Act in a way that the responsibility is with the licensee and cannot be delegated.
- aspects from GRS Part 3 are properly addressed in Section 29 of the new Act
- aspects of Safety Culture are addressed in Section 29 and SÚJB has the authorization to issue decrees on this topic.
- aspects of Safety Assessment are properly addressed in Section 47 and SÚJB has the authorization to issue decrees on this topic.
- regulations for modifications are properly addressed. In the new Act there is a clear definition for modifications and a description for a graded approach to deal with modifications dependent on the safety relevance.
- remedial measures are explicitly addressed in the new Act.

As a result of this limited confirmation, the IRRS Team determined that the new Atomic Act is well designed, covers the main stages of activities and reflects the latest knowledge. Even aspects of ongoing discussions within the EU are covered. The IRRS Team encourages SÚJB to complete this activity.

Process of development of acts, decrees and guides

SÚJB has the right to initiate legislation and is the professional guarantor of legislation in the fields of its competence given by the Atomic Act in the Czech Republic. The first step for issuing new regulations is a decision of the SÚJB management. The draft for the new regulations is prepared inside SÚJB in consultation with relevant stakeholders.

There is a clear structured governmental process (Legislative rules of the government) in place to issue legally binding regulations in the Czech Republic. This process is mandatory. SÚJB uses this process for issuing acts and decrees. This process contains different steps including consultation with selected bodies of the government, professional societies, permit/approval holders and industry. Also it is mandatory for a public commenting period which is conducted via the government website (<https://apps.odok.cz/kpl-detail?pid=KORN9C6AV6D4> for new AA). Following approval by Parliament (in the case of a law) or the Legislative Council of the Czech Republic (in the case of a degree) the regulations come into force.

For issuing guides (nuclear safety and radiation protection) there is an internal process (VDS 027) in place. This process requires consultation with relevant stakeholders. SÚJB publishes the guides on its external webpage.

Issuing decrees by the Czech legislative system is only possible if there is an authorization in the Atomic Act. The authorizations in the current Act do not cover all areas for which nuclear safety regulatory requirements for nuclear facilities should be issued. Considering the current legislative framework for nuclear safety in the Czech Republic, SÚJB has been developing regulatory guides without issuing the corresponding regulatory requirements (e.g. decrees). The current situation may have a negative impact on the stability and consistency of regulatory control. A top-down approach is needed in developing the regulatory framework, by starting with the development of regulatory requirements, followed by the issuance of regulatory guides, as necessary. SÚJB and the relevant authorities have initiated a revision of the Act and are planning to include additional provisions to grant SÚJB the authority to issue regulatory requirements in all areas of nuclear safety. This process should be completed in a timely manner.

Process of reviewing and updating of acts, decrees and guides

In the Czech Republic there is, according to EU-Legislation, a 10 year cycle for reviewing regulations in place. SÚJB itself has no formalized internal process for reviewing and updating acts, regulations and guides. Also there is no formal “trigger” for SÚJB to react in case of a change in IAEA Safety Standards.

SÚJB has clearly recognized that they have to improve the procedure for reviewing and updating regulations and guides. This topic is properly addressed in the SÚJBs action plan. SÚJB proposes that on a 5 year cycle unless there was another incentive, the respective unit or the chairperson shall be responsible for initiating the review, depending on the category of the document. The IRRS Team considers this SÚJB proposal to be reasonable and suitable.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: The Czech legislative framework for nuclear safety requires specific provisions in the Act in order to allow SÚJB to issue regulatory requirements (e.g. decrees). The provisions in the current Act do not cover all areas where nuclear safety regulatory requirements for nuclear facilities should be issued (esp. PSR). Considering the current legislative framework for nuclear safety in the Czech Republic, SÚJB has developed regulatory guides without issuing the corresponding regulatory requirements (e.g. decrees). The current situation may have a negative impact on the stability and consistency of regulatory control. A top-down approach is needed in developing the regulatory framework, by starting with the development of regulatory requirements, followed by the issuance of regulatory guides, as necessary. SÚJB and the relevant authorities have initiated a revision of the Act and are planning to include additional provisions in the Act to allow SÚJB issuing authority for regulatory requirements in all areas of nuclear safety. This process should be completed in a timely manner.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 32 states that <i>“The regulatory body shall establish or adopt regulations and guides to specify the principles, requirements and associated criteria for safety upon which its regulatory judgements, decisions and actions are based.”</i></p> |
| (2) | <p>BASIS: NS-R-4 Para. 3.2 states that <i>“The government shall ensure that an adequate legal infrastructure and regulatory basis for assessing the safety of the research reactor is available. The government is”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| R10 | <p>Recommendation: The Government should ensure a top-down approach is used for issuing regulatory requirements and guides. This may be achieved by ensuring the revised Act will contain all the necessary provisions for allowing SÚJB to develop regulatory requirements for all areas of nuclear and radiation safety for nuclear facilities.</p> |
| | <p>Observation: A cross-reference with the IAEA requirements and guides with the current Czech legislation (Atomic Act, decrees and guidelines) shows that the IAEA requirements are not completely implemented. There is no formalized process in place for the review of regulations and guides which ensures that a systematically periodical review is done (SÚJB did such a cross-reference up to now only for the WENRA reference levels). Especially new developed IAEA requirements should systematically be checked and if appropriate adopted into the Czech legislative framework.</p> |
| (1) | <p>BASIS: GSR Part 1 Req. 33 states that <i>“The Regulations and guides shall be reviewed as necessary to keep them up to date, with due consideration taken of relevant international safety standards and of technical standards and of relevant experience gained...”</i></p> |
| R11 | <p>Recommendation: SÚJB should have a formalized procedure to undertake a gap analysis between new IAEA requirements and the Czech legislative framework in order to draft revisions to the legislative framework to keep legislation up to date. SÚJB should develop a process for reviewing and updating regulations and guides systematically. Especially new developed IAEA requirements should systematically be checked and if appropriate adopted into the Czech legislative framework.</p> |

9.2. REGULATIONS AND GUIDES FOR NUCLEAR POWER PLANTS

There is a comprehensive set of decrees and guides for NPPs in place. The most important decrees are:

215/1997 Coll. Siting

106/1998 Coll. Commissioning and Operation

195/1999 Coll. Basic Design Criteria

307/2002 Coll. on Radiation Protection

318/2002 Coll. Emergency Preparedness

185/2003 Coll. Decommissioning

132/2008 Coll. Quality Assurance System

In 2009 and 2010 SÚJB issued additional guides on the requirements concerning nuclear facility design (BN-JB-1.1 to BN-JB-3.1)

The IRRS Team reviewed these decrees versus the requirements of SSR 2.1 (2012) and SSR 2.2 (2011). The result was the current decrees didn't fully cover the IAEA Requirements. Examples of IAEA requirements not covered were:

- Periodic Safety Review (Requirement 12)
- Probabilistic Safety Assessment (Requirement 12)

- Design Extension Conditions and Severe Accidents in design of NPPs (Requirement 20)
- Safety Culture (Requirement 3, Requirement 5)

SÚJB has recognized that the legally binding requirements for NPPs in the Czech legislative framework have to be updated. Some of the points listed above were integrated by SÚJB to the regulatory practice, e.g. by adding appropriate license conditions (e.g. PSR, PSA) and issuing regulatory guides.. Nevertheless it's the stated goal of SÚJB to update the relevant decrees. It intends to do this through the new Atomic Act. The IRRS Team encourages SÚJB to complete this activity.

9.3. REGULATIONS AND GUIDES FOR RESEARCH REACTORS

The legal and regulatory infrastructure includes provisions for the regulation of research reactors. In general, the research reactors are regulated on the basis of the same principles as nuclear power plants and other nuclear installations.

By considering the design features of relative low risk in research reactors, a team was composed to develop a regulatory guide which can be applied to the design, commissioning and operation of research reactors. The task force team was composed of SÚJB experts, licensees, and independent experts who participated and developed a draft regulatory guide. SÚJB issued it as Regulatory Guide BN-JB-1.15 (Requirements on Nuclear Research Facilities with Respect to Nuclear Safety, Radiation Protection, Physical Protection and Emergency Preparedness) in 2004. Other regulatory guides are being applied to research reactors by considering a graded approach.

Due to out-of-date design and long term operation, there have been several major design changes for research reactors operated in the Czech Republic. In particular, human factors engineering is being used in the design of new digital I&C system. In the licensing review of refurbishment, it is important to check whether human factors are reflected systematically in the design. However, the regulatory framework does not contain comprehensive regulatory requirements for human factors.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: There have been several major design changes for research reactors operated in Czech Republic but the regulatory framework does not contain comprehensive regulatory requirements for taking into consideration human factors in design. |
| (1) | BASIS: GSR Part 1 Req. 32 states that <i>“The regulatory body shall establish or adopt regulations and guides to specify the principles, requirements and associated criteria for safety upon which its regulatory judgements, decisions and actions are based.”</i> |
| (2) | BASIS: GSR Part 1 Para. 4.44 states that <i>“Any proposed modification that might significantly affect the safety of a facility or activity shall be subject to a review and assessment by the regulatory body.”</i> |
| (3) | BASIS: GSR Part 1 Para. 4.45 states that <i>“In the process of its review and assessment of the facility or activity, the regulatory body shall take into account such considerations and factors as: (1) The regulatory requirements;”</i> |
| (4) | BASIS: SSR-2/1 Req. 32 states that <i>“Systematic consideration of human factors, including the human–machine interface, shall be included at an early stage in the design process for a nuclear power plant and shall be continued throughout the entire design.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (5) | BASIS: NS-R-4 Para. 6.61 states that <i>“Human factors are an important aspect in the safety of research reactors as the state of the reactor changes frequently and the operator has easy access to the reactor core and to experiments. Human factors and human–machine interfaces shall be given systematic consideration at an early stage of the design and throughout the entire design process.”</i> |
| R12 | Recommendation: SÚJB should require comprehensive and systematic consideration of human factors at the early stage of the design process of the nuclear facilities and when modifying relevant SSCs. |

9.4. REGULATIONS AND GUIDES FOR FUEL CYCLE AND WASTE MANAGEMENT FACILITIES

The processing, refining, conversion, enrichment, fabrication of fuel (including MOX fuel), spent fuel storage, spent fuel reprocessing, waste conditioning and storage, and fuel cycle research and development facilities are considered as fuel cycle facilities . Only spent fuel storage away from the reactor was considered under this module as the other types of fuel cycle facilities either do not exist in the Czech Republic or are covered by other modules.

The regulatory requirements for RAW management and spent nuclear management are defined in the Atomic Act in Chapter 4 under Sections 24-31 and in Decree No. 307/2002 Coll. under Sections 46-55. Section 46 of Decree 307/2002 Coll states that a licence is required for radioactive waste management that includes collection, sorting, processing, treatment, storage and disposal. Section 53 details the limits and conditions for the safe management of radioactive waste. Under the terms of the Atomic Act, the Government guarantees safe disposal of all radioactive waste, including monitoring and supervision of repositories after their closure. Each radioactive waste management facility develops and implements a Waste Acceptance Criteria. Waste minimization is considered in the overall waste management programme.

Every project for a new fuel cycle facility such as spent fuel storage away from the reactor follows an authorization process that addresses all safety aspects in a similar way as for NPPs..

The authorization is a step by step process starting at the site planning and continuing up to and including the decommissioning of the facility.. The authorization from SÚJB takes the form of licences, which are required by the operating organization of any fuel cycle facility before each step of facility development..

SÚJB ensures that the operating organization has made adequate arrangements for keeping the licensing documentation up to date. SÚJB ensures that the licensing documentation including references to supporting documents and that the operating organization maintains the reference material readily available upon request.

9.5. REGULATIONS AND GUIDES FOR RADIATION SOURCES FACILITES

For radiation sources, the most important regulation is the Radiation Protection Regulation 307/2002 which implements much of what is in the 1996 BSS. The SÚJB has issued a comprehensive set of practice guides. These guides provide the licensees with practical guidance on the implementation of the regulatory requirements. However, the guides are not legally binding and a licensee may choose alternative approaches. In such a case the licensee shall explicitly demonstrate that the requirements are met. The guides also serve as the reference for the inspectors during reviewing and assessing license applications and in conducting inspections.

9.6. REGULATIONS AND GUIDES FOR DECOMMISSIONING ACTIVITIES

In addition to the Atomic Act, decommissioning is supported by Decree 185/2003 Coll. The Decree provides for the scope and method of decommissioning for nuclear installations or category III or IV workplaces. The Decree allows the licensee to propose the type of decommissioning either immediate or deferred. The Decree also sets out the scope and form of documentation for the decommissioning activity which must be approved by the regulatory body. Decommissioning has to be authorized by the SÚJB. Section 6 “Termination of Decommissioning” states that a final decommissioning report must be submitted to the regulatory body. Once submitted to SÚJB an inspection is performed verifying the conclusions of the final decommissioning report. Then SÚJB decides on restricted or unrestricted use of the site. In the case the site cannot be released for unrestricted use, adequate measures have to be taken in order to secure control over the area corresponding to the conditions of the area from the radiation protection viewpoint (Section 6, letter 2 of Decree 185/2003 Coll.). The clearance levels for unrestricted use of the site are listed in Annex 2 of Decree No. 307/2002 Coll.

Decommissioning Plans are required by the SÚJB and are updated on a 5 year cycle. The creation of the decommissioning funds is required by Section 18, para 1, letter h) of Atomic Act and the details of the funds are described in by the Decree No. 360/2002 Coll. of Ministry of Industry and Trade and the estimated cost of decommissioning is also updated on a 5 year cycle. The review of the decommissioning plan by SÚJB and the decommissioning fund by the SÚRAO are conducted in parallel.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: Decree 185/2003 Coll of the State Office for Nuclear Safety and the Atomic Act briefly discusses unrestricted release of a site following decommissioning. SÚJB expectations are not clearly defined for the release from regulatory oversight. |
| (1) | BASIS: WS-R-5 Para. 3.6 states that <i>“The responsibilities of the regulatory body include evaluating the end state of a decommissioned facility and deciding whether the conditions have been met to allow the termination of the practice and/or release from regulatory controls or whether further activities or controls are needed.”</i> |
| (2) | BASIS: WS-G-5.1 Para. 3.7 states that <i>“The regulatory body should establish safety requirements and guidelines for the planning, approval and conduct of cleanup activities, for the management of contaminated material and the waste that arises from this process, and for the release of land, buildings and structures from regulatory control.”</i> |
| R13 | Recommendation: SÚJB should include in its licensing scheme a method for restricted or unrestricted release of the land, buildings and structures from further regulatory control. Regulatory criteria and procedures for restricted or unrestricted release of the land, buildings and structures from further regulatory control should also be provided. |

9.7. REGULATIONS AND GUIDES FOR TRANSPORT ACTIVITIES

The development of a new version of the Atomic Act and new implementing regulations are at an advanced stage and take into account technical development, new knowledge resulting from membership of the Czech Republic in the European Union, membership in international organisations, staff experience and feedback.

The legal framework for shipment in the Czech Republic is clearly specified on the SÚJB website <http://www.sujb.cz/en/nuclear-safety/radiation-material-transportation/legal-framework>.

A comprehensive list of the UN and IAEA Transport Regulation and Safety Guides as well as a glossary of terms is also included.

A summary of the application for shipment approval as well as an overview of the safety documentation required and the items to be included in the emergency procedures are specified on the website <http://www.sujb.cz> in the nuclear safety section. A section on the safety of transport of radioactive material and the approvals required from SÚJB are also provided. A list of type approvals for Czech made packages, international packages and for radioactive material is also available. Safety Guide No. BN-JB-1.13 Transport of Radioactive Material, 2011 is a useful reference for users and relevant SÚJB staff.

The competent authority also provides training to its own personnel. The contents of such training is outlined in an Internal document – Directive No. 039 /2001 (rev. 3/2012) System of education, training and assessment for the employees of the State Office for Nuclear Safety. This training includes information on transport regulations and transport safety in general.

Additionally it is expected that relevant requirements of the new European Commission Basic Safety Standards Directive, the Directive 2006/117 on waste, the Directive on inland transport of dangerous goods and the main provisions of IAEA TS-G-1.4 (The Management System for the Safe Transport of Radioactive Material) and IAEA TS-G-1.5 (Compliance Assurance for the Safe Transport of Radioactive Material) will be incorporated in the new Atomic Act. It is anticipated that the planned provisions will provide a good basis for compliance with the transport safety standard and the aforementioned IAEA Guidance.

9.8. SUMMARY

The Czech Republic has a well-established legislative and regulatory framework for the use of nuclear energy, the uses of radiation sources and for the protection of people and the environment from the harmful effects of ionising radiation. In the Atomic Act main stages of radiation utilisation are addressed (siting, construction, commissioning, operation, reconstruction and decommissioning). The system of decrees and guides is enabled by the Atomic Act.

The IRRS Team recognized that the IAEA Requirements are not fully implemented in the current system of regulations. Where SÚJB regards the matter as appropriate, new IAEA Safety Standards are made obligatory through licence conditions. In addition there is no formalized process in place for reviewing and updating regulations.

SÚJB has clearly recognized that the Czech legislative and regulatory framework have to be updated. SÚJB has therefore started an intensive project to prepare and implement a new Atomic Act and its related decrees. The target of SÚJB is to implement the latest knowledge and experience from regulatory practice. As a result of a limited review of the draft of the new Atomic Act, the IRRS Team determined that the new Atomic Act is well designed, covers the main stages of activities and reflects the latest knowledge. Even aspects of on-going discussions within the EU are covered. The IRRS Team encourages SÚJB to complete this activity.

10. EMERGENCY PREPAREDNESS AND RESPONSE

10.1. GENERAL REQUIREMENTS

Basic responsibilities

The emergency management system implemented in the Czech Republic has the following structure:

- The National Security Council is a permanent working body of the Government for crisis preparedness. The Central Crisis Staff which is the working body of the Government for response coordinates all response activities of the Ministries and Central Administration Offices in crisis situations. In case of a nuclear or radiological emergency the chairperson of SÚJB is member of the Central Crisis Staff.
- The Ministry of Interior is the lead organisation for the Central Crisis Staff in case of civil crisis and is among others, responsible for Fire Rescue Service, the Integrated Rescue System and the operational information centres as warning points at international, national and regional level of the Czech Republic.
- SÚJB is the regulator responsible for regulating and inspecting on-site emergency preparedness for all nuclear facilities and practices with radiation sources including the emergency preparedness and response for transport of radioactive material. In emergency situations, SÚJB (through its Crisis Staff) is responsible for evaluating radiological situations based on information from the licensee, prognoses from the decision support system Emergency Source Term Evaluation System (ESTE) and measurement data from the Radiation Monitoring Network. SÚJB is also responsible for recommending protective actions to the government or to the Head of the affected region (depending on the type of emergency situation). In addition SÚJB is the competent authority according to international emergency conventions.
- Regional Authorities are responsible for elaborating regional emergency plans (including the Off-Site Emergency Plan for the NPPs). In addition, these authorities operate the regional operation and information centres.
- The licensee is responsible for the on-site emergency response in accordance with the On-Site Emergency Plans prepared by the Licensee and approved by SÚJB.

Based on information provided by SÚJB and Ministry of Interior - General Directorate of the Fire Rescue Service, the IRRS team concluded that arrangements for response to a nuclear or radiological emergency in the Czech Republic are well co-ordinated and well incorporated with the arrangements for response to conventional emergencies.

The national legislation establishes an Integrated Response System under which a Crisis Management System is established. For response purposes, a Central Crisis Staff at state level and Regional Crisis Staff at regional level are established. SÚJB is a member of the Central Crisis Staff if a nuclear or radiological emergency occurs. These arrangements for response to nuclear or radiological emergencies are well integrated with the arrangements for response to conventional emergencies.

The national and the regional operational information centres of Fire Rescue act as warning points as well as performing their operational responsibilities. The integrated rescue system prepares for and responds to emergencies from all hazards.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: Preparation and response to nuclear and radiological emergencies are very well integrated into the national infrastructure to face conventional emergencies. The integrated rescue system considers among others the arrangements to respond to a nuclear or radiological emergency. SÚJB has in this regard a well-recognized role and it is a permanent member of the National Security Council and if a nuclear or radiological emergency would occur also member of the Central Crisis Staff.</p> |
| (1) | <p>BASIS: GS-R-2 Para. 4.09 states that <i>“Arrangements for a nuclear or radiological emergency shall be integrated with arrangements at the national and local level for response to conventional emergencies.”</i></p> |
| GP8 | <p>Good Practice: The nuclear and radiological emergencies are very well integrated on the national structure to face all other emergencies (e.g. conventional emergencies) where SÚJB would play a key role if a radiation emergency occurs.</p> |

Legal requirements

The Czech government has enacted legislation for emergency preparedness and response to all crisis situations including nuclear and radiological accidents. The Czech Republic has agreements on information exchange and cooperation in the field of nuclear and radiation safety with all neighbouring states. The Czech Republic is party to the Convention on Early Notification of a Nuclear Accident and to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

Some areas were identified where the legislation (Atomic Act and subsequent decrees) is not in line with GS-R-2. Specifically the team considers that:

- Threat categorization is not fully in line with GS-R-2, as the categorization to threats in the Czech system is based on emergency classes. These classes, according to GS-R-2 shall be established for the prompt identification of an actual or potential nuclear or radiological emergency and determination of the appropriate level of response established for notification.
- There is no national emergency plan for nuclear and radiological emergencies to cover all threat categories. There are several plans (as described in the functional requirements section) covering specific threats and responsibilities at national and regional level but a national emergency plan considering all nuclear and radiological threats is missing.
- General recovery actions are governed by Czech legislation but recovery after a radiation accident is not explicitly addressed.

The IRRS team were informed that these inconsistencies with GS-R-2 are intended to be solved in the new Atomic Act.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: The Czech legislation is not fully in compliance with GS-R-2 requirements in relation to threat categorization; a national emergency plan to cover all threat categories and recovery actions. The first two elements were also highlighted on the SÚJB action plan.</p> |
| (1) | <p>BASIS: GS-R-2 Para. 3.9 states that <i>“In fulfilling its statutory obligations, the regulatory body... shall establish, promote or adopt regulations and guides upon which its regulatory actions are based; ...”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | BASIS: GS-R-2 Para. 3.15 states that <i>“The threat assessment shall be so conducted as to provide a basis for establishing detailed requirements for arrangements for preparedness and response by categorizing facilities and practices consistent with the five threat categories shown in Table I.”</i> |
| (3) | BASIS: GS-R-2 Para. 5.13 states that <i>“Plans or other arrangements shall be made for co-ordinating the national response to the range of potential nuclear and radiological emergencies. These arrangements for a co-ordinated national response shall specify the organization responsible for the development and maintenance of the arrangements; shall describe the responsibilities of the operators and other response organizations; and shall describe the co-ordination effected between these arrangements and the arrangements for response to a conventional emergency...”</i> |
| (4) | BASIS: GS-R-2 Para. 4.100 states (under the title conducting recovery operation states) that <i>“... The regulatory body shall provide any necessary input to the intervention process. Such input may be advice to the government or regulatory control of intervention activities. Principles and criteria for intervention actions shall be established and the regulatory body shall provide any necessary advice in this regard. This process shall include public consultation.”</i> |
| R14 | Recommendation: The Government should ensure that threat categorization, national emergency plan and recovery actions in the Czech legislation will be in line with GS-R-2 requirements. |

Assessment of Threats:

Threat categorisation according to GS-R-2 is not legally implemented in the Czech Republic. In accordance with national legal requirements, the Czech Republic has its own classification system that was developed based on different levels of extraordinary events (Level 1 to Level 3). These levels are emergency classes rather than threat categories. Furthermore, the threat category V as defined in GS-R-2 is not considered in the referred legislation.

The time period within which the licensee must notify the SÚJB, of extraordinary events for the different levels is defined by legal requirements. For preparation of the Advance Reference Material (ARM) SÚJB applied the GS-R-2 threat categorisation to classify their nuclear installations and practices. SÚJB informed the IRRS team that for the research reactor at the Řež site no emergency planning zone was established (as described on chapter 6.3) and therefore this research reactor was classified in the ARM as threat category III.

10.2. FUNCTIONAL REQUIREMENTS

Establishing emergency management and operations

Currently, the following emergency plans for nuclear and radiological emergencies are legally required:

- Crisis Plans, at all levels (Government, Central Administration Offices, Self-Administration Offices);
- Off-Site Emergency Plans by the regional Fire Rescue Service for Emergency Planning Zones based on input by the NPP. These plans are discussed between all relevant organisation and stakeholders including SÚJB and are approved by the Head of the respective regions.

- On-Site Emergency Plans by Licensees and approved by SÚJB. As part of this approval process and according to the Atomic Act, discussions are required between the operator and relevant regional authorities to ensure the compatibility between the off-site and on-site emergency plans.
- A special plan for medical response is part of both the on-site and off-site emergency plans.
- Emergency Rules for transportation of radioactive material approved by SÚJB

There is no overarching national plan required for nuclear and radiological emergencies. The IRRS team was informed that preparation of the national radiation emergency plan is planned to be included in the upcoming new Atomic Act.

Identifying, notifying and activating

In emergency response, SÚJB is responsible for analysing the radiation situation based on prognoses and measurement results. Based on this analysis SÚJB will recommend protective actions for the population affected.

For this purpose and to support an effective response from the SÚJB crisis staff, SÚJB has developed state of the art software which is tailored to their needs (as detailed below).

The IRRS team was informed that there is no legal basis for establishing emergency action levels (EALs). In addition, SÚJB has not defined criteria for EALs for the licensee and is not required to approve EALs. According to the Atomic Act, the licensee is obliged to notify SÚJB in the event of an emergency. The licensee is also obliged to inform other organizations, involved in the response management, of any extraordinary event, when the licensees pre-set emergency action levels (EALs) are exceeded. EALs are well established at the NPPs.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The NPP has action levels in their procedures for declaring a nuclear emergency (emergency action levels) but these levels are not required by Czech regulatory framework. |
| (1) | BASIS: GS-R-2 Para. 4.20 states that <i>“The emergency classification system for facilities or practices in threat category I, II, III or IV shall take into account all postulated nuclear and radiological emergencies. The criteria for classification shall be predefined emergency action levels (EALs) that relate to abnormal conditions for the facility or practice concerned, security related concerns, releases of radioactive material, environmental measurements and other observable indications (see para. 4.70) ...”</i> |
| (2) | BASIS: GS-R-2 Para. 4.70 states that <i>“The operators of facilities in threat category I, II or III shall make arrangements to assess promptly: abnormal conditions at the facility; exposures and releases of radioactive material; radiological conditions on and off the site; and any actual or potential exposures of the public. These assessments shall be used for mitigatory actions by the operator, emergency classification, urgent protective actions to be taken on the site, the protection of workers and recommendations for urgent protective actions to be taken off the site (see para. 4.20). These arrangements shall include access to instruments displaying or measuring those parameters that can readily be measured or observed in the event of a nuclear or radiological emergency and which form the basis for the EALs (see para. 4.20) used to classify emergencies ...”</i> |
| R15 | Recommendation: SÚJB should establish requirements for emergency action levels in the Czech regulatory framework. |

During the IRRS mission, the team observed an exercise where SÚJB crisis staff and the NPP Dukovany emergency staff were involved. SÚJB crisis staff was activated based on an alert of a level 2 extraordinary event in the NPP. It was observed that the personnel of SÚJB crisis staff were well organized and familiar with the internal procedures to assess the situation. Notification and information forms at international and national level were prepared accordingly. After the exercise was finalized with a brief meeting a final situation report was generated and initial feedback was received. According to internal procedures, a detailed evaluation of the exercise has to be prepared by all participants and SÚJB high level management has to be informed.

The IRRS team was informed that emergency exercises are subject of SÚJB inspections but the local inspector from SÚJB does not participate during these exercises. The team was also informed that there are no provisions to have a SÚJB representative on site during emergency situations.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: During an exercise observed by the IRRS team and also during a site visit to Dukovany NPP, it was noted that the local SÚJB inspector is not on site at the Emergency Control Centre (ECC). In addition, SÚJB informed the IRRS team that there are no provisions to have any SÚJB representative on site during emergency situations. The IRRS Team considers that it would be valuable to have a liaison officer of SÚJB in the NPP ECC ensuring the SÚJB independent assessment of the situation development and communicating to the SÚJB Crisis Staff on the overall status of the operator’s emergency response (without intervening in the emergency response of the operator nor removing the responsibility of the operator to provide this information through already well-established official channels). |
| (1) | BASIS: GS-R-2 Para. 4.5 states that <i>“Information necessary for making decisions on the allocation of resources shall be appraised throughout the emergency.”</i> |
| (2) | BASIS: GSR Part 1 Req. 8 Para. 2.23 states that <i>“The government shall specify and shall assign clear responsibilities for decision making in an emergency, and shall make provision for effective liaison between authorized parties and competent authorities and for an effective means of communication.”</i> |
| (3) | BASIS: GSR Part 1 Req. 27 states that <i>“The regulatory body shall carry out inspections of facilities and activities to verify that the authorized party is in compliance with the regulatory requirements and with the conditions specified in the authorization.”</i> |
| S16 | Suggestion: SÚJB should consider having an inspector present on site in the Emergency Control Centre in emergency situations, in order to provide independent oversight and to communicate with the SÚJB Crisis Staff. |

Since the 1990s the bilateral cooperation between SÚJB and the Austrian competent authority in the field of 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 ESTE data exchange; 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.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: Since the 1990s the bilateral cooperation with Austria in the field of EPR has evolved to very detail agreements on information pathways and procedures; provision of information on source term and plant conditions; installation and data exchange of the ESTE decision support system; exchange of dispersion results and trajectories from the Austrian prognosis system; exchange of measurement data of the automatic monitoring networks; bilateral exercises and yearly bilateral expert meetings.</p> |
| (1) | <p>BASIS: GS-R-2 Para. 4.15 states that <i>“In the event o transnational emergency the notifying state shall promptly notify directly or through IAEA those states that may be affected. The notifying state shall provide information concerning the nature of the emergency and any potential transnational consequences and shall respond to requests from other states and from the IAEA for information with intent of minimizing the consequences.”</i></p> |
| (2) | <p>BASIS: GS-R-2 Para. 4.30 states that <i>“The State shall make arrangements for promptly notifying and providing relevant information to, directly or through the IAEA, those States that may be affected by a transnational emergency. The State shall make arrangements for promptly responding to requests from other States or from the IAEA for information in respect of a transnational emergency, in particular with regard to minimizing any transnational consequences.”</i></p> |
| GP9 | <p>Good Practice: SÚJB promotes and is part of a very detailed bilateral cooperation with Austrian competent authority including provision of real time data (source term, on site weather data and measurement data) as input to Austrian’s decision support system. This cooperation is periodically tested in yearly exercises.</p> |

Taking mitigatory actions

The IRRS team was informed that an NPP licensee that it is obliged to send reports to SÚJB during an emergency situation on its site. In case of an NPP licensee these reports include e.g. information on the source term, the estimated time when release will start (warning time) or the time when the actual release started. The report includes trend information on the situation, including estimates of when the release is reduced by e.g. the impact of mitigation actions in a severe accident. In case of automatic data transmission interruption, a reduced set of technological, radiation and meteorological parameters and data has to be sent to SÚJB.

Taking urgent protective action

The following urgent protective measures are prepared in Emergency Planning Zone (EPZ):

- Evacuation will be decided by the government and implemented by the affected region(s) and municipalities considering recommendations from SÚJB.
- In the Precautionary Action Zone (PAZ), the whole zone is planned to be evacuated
- In the UPZ, evacuation will be recommended only in villages which are or could be affected (based on prognoses).
- Sirens warning, sheltering and Iodine Prophylaxis are automatically implemented in whole EPZ after declaration of extraordinary event level 3.

The population that may need to be evacuated is approximately as follows:

- Temelín’s urgent protective action planning zones (13 km): 32.000 people, including 10.000 people within the PAZ established at a radius of 5 km around the NPP.
- Dukovany’s urgent protective action planning zones (20 km): 96.000 people, including 13.000 people within the PAZ established at a radius of 10 km around the NPP.

In case of accidents abroad affecting Czech Republic only sheltering in place is expected to be required. The same applies to Czech NPPs accidents with consequences beyond the emergency planning zone.

SÚJB in this regard, recommends protective actions to the Government through the Central Crisis Staff.

Providing information and issuing instructions and keeping the public informed

The NPP licensee is obliged by the legislation to provide instructions to the public in the emergency planning zone. In this regard the licensees prepare, in advance, information for the public in the EPZ. One example for this is a calendar, which includes dates where the sirens are tested, as well as the notices to be left by the self-evacuated people for the purposes of verifying evacuation. These notices include information about the number of persons that were in the house, means of evacuation, and other information, including contact details. SÚJB has been actively involved during the development of this information material.

The off-site emergency plan includes a specific “Plan of Communication with the Public” in the emergency planning zone; this plan establishes that every organization should provide information on the topics that are under its competence. In case of emergency situations, crisis staff at different levels issue information to the public after their meetings whenever needed.

SÚJB has its own arrangements to provide information to the public. These arrangements were effectively tested during previous events (i.e. Fukushima, as described in chapter 12.1) where SÚJB had a role in providing information to the public. Nonetheless a comprehensive strategy for informing the public and media about nuclear and radiological emergencies is missing.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: There is no comprehensive strategy on SÚJB to communicate with the public and media in case of nuclear and radiological emergencies. |
| (1) | BASIS: GS-R-2 Para. 4.84 states that <i>“The operator, the response organizations, other States and the IAEA shall make arrangements for co-ordinating the provision of information to the public and to the news and information media in the event of a nuclear or radiological emergency.”</i> |
| S17 | Suggestion: SÚJB should consider improving its arrangements to provide information to the public and to the media during a radiation emergency, by establishing a comprehensive strategy in this regard. |

Protecting emergency workers

The dose reference levels for emergency workers (intervening persons) are defined in the legal system. This legal system establishes that emergency workers shall be informed about the risks relating to their participation in an intervention and shall participate on a voluntary basis only.

The IRRS team was informed that emergency workers at NPPs are mobilized from the Technical Support Centre (which is situated in a shelter).

SÚJB informed the IRRS team that sufficient protective equipment and dosimeters, which are stored in the on-site shelters, are required for the on-site emergency workers; these items are among others subject of SÚJB inspections and currently the operators fulfil these requirements.

In addition, first responders' special teams from the Integrated Recue System are equipped with personal dosimeters and personal protective equipment. Each intervention team has also a dosimeter with acoustic alarm.

The IRRS team was informed that a central dose register has been established in the Czech Republic which also includes doses of emergency workers. Inhalation doses are estimated based on prognoses or measurements depending on the availability of data (including whole body counters for fast scanning in the NPPs).

Conducting recovery operations

Czech legislation does not consider specific recovery actions in case of nuclear and radiological emergencies.

It is intended nonetheless to include a separate chapter on remediation under the new Atomic Act which, the IRRS team was informed, will bring the legal requirements in line with GS-R-2.

SÚJB is responsible for recommending agricultural countermeasures, countermeasures against ingestion and longer term protective actions. These recommendations, for distribution and consumption of foodstuffs, drinking water and fodder, or other products are based on the monitoring of the radiation situation.

10.3. REQUIREMENTS FOR INFRASTRUCTURE

The emergency response centre of SÚJB is directly under the supervision of the SÚJB chair. Three persons are responsible for inspections in the field of EPR arrangements for NPPs and other relevant licensees. The five members of the emergency response centre organise shifts, develop emergency related procedures, checklists and others. They also ensure and maintain the infrastructure at the SÚJB emergency response centre which is the SÚJB crisis staff workplace.

For the crisis staff 50 persons from SÚJB are available, with 8 persons having on call duty function for the period of a week. In case of an emergency and if full activation is needed all 8 persons need to come to the emergency response centre and the shifts are planned to change after 8-12 hrs. In addition some staff (up to 20 persons depending on type and size of the occurred event) from the TSOs (such as from the National Radiation Protection Institute) can support the SÚJB crisis staff. The staff is also supported by persons ensuring aerial survey and mobile group radiation situation monitoring.

The licensee has to establish a general quality assurance programme, which is approved by SÚJB. This general programme includes EPR. The IRRS team was informed that SÚJB does not have EPR specific requirements for it.

As stated above, SÚJB has developed specific software which is tailored to its needs and user friendly to support its emergency response capabilities under emergency environmental working conditions. This software can be summarized as follows:

- A decision support and source term evaluation system (ESTE) based on technological parameters from the plant, radiation measurement data, and weather prognoses from Czech Hydro-meteorological Institute and on-site weather data,

- An integrated system for analysing and visualisation of all measurement data (MonRaS) including data from automatic early warning network, mobile monitoring teams and laboratory measurements of environmental samples or foodstuff,
- Software for managing the on call duty system by sending messages not only to SÚJB personnel but also to other relevant personnel from regional and national organizations to inform them about the SÚJB crisis staff shift composition and contact numbers on a weekly basis,
- Integrated System for the contact point of the SÚJB's crisis staff for sending and receiving all relevant alerting information via phone calls, e-mail, fax and SMS.

SÚJB is actively involved in the preparation, implementation and evaluation of emergency exercises in all relevant practices at different levels. This includes international exercises, national full scale exercises (e.g. ZONA) with the participation of relevant response organizations, NPP related exercises testing interfaces with SÚJB and legally binding exercises of licensees, all of which are inspected by SÚJB. SÚJB also has a role in developing national exercise programmes.

While the Ministry of Interior leads the evaluation and follow up process for exercises at the national level, SÚJB follows up the implementation of improvement measures of all other nuclear and radiological exercises. A similar approach is followed for internal exercises where SÚJB response capabilities are periodically tested.

Emergency drills and exercises are also conducted for transport of radioactive material.

10.4. SUMMARY

The nuclear and radiological emergency preparedness and response is well integrated in the national crisis management structure. SÚJB plays a key role if a nuclear or radiological emergency occurs, its role is recognized at the national level being a permanent member of the National Security Council for preparedness purposes and being also a member of the Central Crisis Staff in emergency situations.

It needs to be mentioned that there are some elements of the national legislation that are not fully in line with the IAEA's GS-R-2 requirements. Specifically this applies to threat categorization, national emergency plan for nuclear and radiological emergencies and recovery actions.

SÚJB should improve as well the way the emergency action levels are defined in their regulatory framework, the role of a SÚJB representative on the NPPs during emergencies and its strategy to communicate with the public in emergency situations.

In the response phase of nuclear or radiological emergencies, SÚJB will assess the radiological situation. Based on this assessment they are obliged to provide recommendations at the national level for the implementation and termination of protective measures. For an effective radiological assessment, SÚJB has developed a series of customised tools as support to its decision making.

11. ADDITIONAL AREAS

11.1. CONTROL OF MEDICAL EXPOSURES

The legal basis for medical exposure control in the Czech Republic is given by the Atomic Act and the implementing Radiation Protection Regulation No 307/2002, which is based on the IAEA BSS 115 and transposes the EC Directives 96/26 and 97/43 into the national legislation. Two new pieces of legislation have been issued, Acts Nos. 372/2011 and 373 /2011 and the Regulation 410/2012 amend articles of the Regulation No 307/2002 regarding “Medical Exposure”, implementing thus the majority of IAEA GSR Part 3 requirements.

There are two authorities involved in the regulatory framework of radiation protection and safety related to medical exposures: the Ministry of Health and SÚJB.

SÚJB has issued several regulations and guides establishing conditions, requirements, limits, diagnostic reference levels (DRLs), dose constraints, guidance levels, etc. In establishing this guidance, SÚJB collaborates with the Ministry of Health, SÚRO (the National Radiation Protection Institute) as well as Scientific and Professional Bodies.

The Atomic Act empowers SÚJB to issue licenses and to perform inspections of medical facilities. The competency to inspect compliance with legal requirements related to medical exposure rests at SÚJB according the Act 372/2011.

Only individuals who have the required qualifications, expertise and training (Act No. 373/2011) may take clinical responsibility for medical exposure (medical practitioner - usually a physician), and the same applies to responsibility for the practical part of the medical exposure (radiology assistant, technician, nuclear medicine nurse and medical physicist).

The qualifications of medical and paramedical staff involved in the medical exposure and the requirements for staffing of medical facilities are regulated by the Acts Nos. 94/2004 and 95/2004 and Regulations 55/2011 and 99/2012. Medical equipment requirements are regulated by the Act No. 123/2000 and the Regulation 92/2012. The calibration of equipment is regulated by the Act 505/90 and the Decree 345/2002.

Justification of medical exposure

The general requirement for justification is given by the Atomic Act. According to Act 373/2011, the Ministry of Health regulates the issue of justification of medical exposures defining the terms and procedures for recognition of new methods and for issuing national referral guidelines. IRRS team members were informed that the Ministry of Health consults the relevant professional bodies before issuing referral guidelines. SÚJB agreement with the justification process for referrals is mandated by law.

The referral guidelines were issued as a Ministry of Health Bulletin No. 11/2003 and are based on the European Commission Report RP 118. The Bulletin includes referral guidelines for many radiological procedures; however only a limited set of referral guidelines for interventional radiology and cardiology were published. The Ministry of Health encouraged the professional societies for cardiology and interventional radiology to review their referral guidelines. IRRS Team members were informed during the site visit at IKEM Hospital that the referral guidelines issued by scientific societies or professional bodies are used in practice.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: Legislation includes specific requirements for the generic justification of radiological procedures. The Ministry of Health has published referral guidelines for radiological procedures in 2003.</p> <p>More detailed and up to date referral guidelines of the Czech professional societies for interventional radiology and cardiology exist but have not yet been incorporated into the national system of referral guidance.</p> |
| (1) | <p>BASIS: GSR Part 3 Para. 3.157 states that <i>“Relevant national or international referral guidelines shall be taken into account for the justification of the medical exposure of an individual patient in a radiological procedure.”</i></p> |
| S18 | <p>Suggestion: The Government should consider reviewing its national strategy regarding the official recognition of referral guidelines in order to facilitate their systematic review, update and dissemination.</p> |

In the Regulation 410/2012 attention is given to the justification of medical exposures of pregnant or breast feeding women and children. This regulation sets down further details for justification of medical exposure to individuals undergoing health screening. Requirements are also provided for medical exposure of volunteers in biomedical research, which is carried out with the consent of Ethics Committees.

Act 373/2011 establishes a system of clinical audits that allows for verification that appropriate justification is taking place and that referral criteria are in use by the physicians, however audits have not yet commenced.

Optimisation of medical exposure

Dose constraints for volunteers in biomedical research are listed in the Regulation 410/2012.

In the Radiation Protection Regulation 307/2002, DRL values are annexed for a standard patient and standard examination procedure, dose constraints for carers and comforters, and requirements for release of the patients to home care after radiopharmaceutical administration.

The first set of published DRLs was taken from IAEA BSS 115. SÚJB commissioned several studies and national DRLs for a series of radiological procedures have been established, however DRLs for some procedures are missing (procedures in interventional radiology, cardiology and paediatric CT) and SÚJB has already initiated a relevant project for their establishment.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: SÚJB has published many DRLs, however DRLs for some procedures are missing (interventional radiology, interventional cardiology, paediatric CT).</p> |
| (1) | <p>BASIS: GSR Part 3 Para. 3.147 states that <i>“The government shall ensure, as part of the responsibilities specified in para. 2.15, that as a result of consultation between the health authority, relevant professional bodies and the regulatory body, a set of diagnostic reference levels is established for medical exposures incurred in medical imaging, including image guided interventional procedures....”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Recommendation of the IRRS Team related to this issue is given in item a) of the general Recommendation related to compliance with GSR Part 3 at the end of the chapter.</p> |
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During SÚJB inspections, licensees are required to provide the values of the local reference levels for radiological procedures for which local DRLs exist. Where the local reference level exceeds the national DRL, the licensee is required to investigate the cause and develop an action plan for optimisation. When local reference levels are significantly lower than the national DRLs the licensee needs to evaluate whether image quality is adequate.

Registrants and licensees are obliged to have in place QA/QC programmes that must be approved by the SÚJB. The activities related to medical exposure may be carried out only by individuals with appropriate qualification, expertise and specialization. Activities carried out by those individuals, their responsibilities and competencies are described in the licensee’s quality assurance programme which is a document approved by SÚJB.

Radiation protection courses are included in the University curricula of the B.Sc. degree for technologists, dentists and orthodontist. For medical specialists in radiology, radiotherapy and nuclear medicine, radiation protection courses are included in their specialty training. There are legal requirements for the recognition of Medical Physicists. In SÚJB Regulation 146/1997, there are requirements for the recognition of a Radiation Protection Expert and Radiation Protection Officer. During inspections, SÚJB verifies the adequacy and training of the personnel as regards radiation protection by checking documents and examination results.

Pregnant and breast feeding women

GSR Part 3 requirements regarding the pregnant and breast feeding women are included in legislation and SÚJB verifies their implementation during the inspections. Information leaflets were produced by SÚJB and are available at X-ray departments. In nuclear medicine departments a written statement from the patients that they are not breastfeeding is required. The IRRS Team has noted that there are no signs requesting female patients to notify staff in the event of a pregnancy or breast-feeding posted in radiological centres or nuclear medicine departments.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation: In the regulations there is no requirement to place signs on appropriate places within radiological departments requesting female patients to notify the radiological medical practitioner, medical radiation technologist or other person in the event of a pregnancy or breast-feeding.</p> |
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| <p>(1)</p> | <p>BASIS: GSR Part 3 Para. 3.174 states that <i>“Registrants and licensees shall ensure that signs in appropriate languages are placed in public places, cubicle and other places ... to request female patients who are to undergo a radiological procedure to notify the radiological medical practitioner, medical radiation technologist or other person, in the event that:</i></p> <p><i>(a) she is or she might be pregnant</i></p> <p><i>(b) she is breast-feeding and the scheduled radiological procedure includes administration of a radiopharmaceutical.”</i></p> |
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RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

Recommendation of the IRRS Team related to this issue is given in item b) of the general Recommendation related to compliance with GSR Part 3 at the end of the chapter.

Release of patients

Release criteria and procedures for patients undergoing nuclear medicine procedures have been published. Information is provided to patients and accompanying persons. Special instructions are given to the patients with I-125 seeds permanently implanted and accompanying persons (provisions are taken for the case of eventual death and subsequent cremation). All patients undergoing nuclear medicine procedures are provided with a special certificate in order to avoid complications in case they are monitored for security reasons at ports or airports.

Unintended medical exposures

In case of unintended exposure, the legislation includes all the necessary provisions for investigation, dose calculations, corrective actions, prevention of reoccurrence, provision of information and record keeping. IRRS Team members had the opportunity to verify compliance with this requirement during an inspection performed by SÚJB at the Radiotherapy Department of the Motol University Hospital.

SÚJB and SÚRO have performed a thorough analysis of the accidents/incidents that have occurred in radiotherapy since 2005.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | Observation: SÚJB and SÚRO have performed a thorough analysis of the accidents and incidents that have occurred in radiotherapy since 2005. The results of the analysis have been presented in workshops and congresses at national and international level and the lessons learned have been used for the optimisation of the methods and procedures in the radiotherapy departments and for training personnel with the aim of preventing reoccurrence. |
| (1) | BASIS: GSR part 3 Req. 41 states that <i>“Registrants and licensees shall ensure that all practicable measures are taken to minimize the likelihood of unintended or accidental medical exposures. Registrants and licensees shall promptly investigate any such exposure and, if appropriate shall implement corrective actions.”</i> |
| GP10 | Good Practice: SÚJB and SÚRO have performed thorough analysis of the accidents and incidents in radiotherapy, the results of which have been communicated and used for optimisation and training purposes. |

Review and records

The performance of radiological reviews at the medical radiological facilities (GSR Part 3) is mandatory.

Clinical Audits are established by the Act 373/2011. Specific provisions are included in regulation 410/2012. Ministry of Health requires internal (annually) and external (once every 5 years) clinical audits to be undertaken at all licensees premises by accredited companies, with the objective of systematic verification and evaluation of medical radiological procedures in order to improve the quality and outcome of patient care. Radiological practices, procedures and results are compared with the requirements of National Radiological Standards. The clinical audits have not yet been implemented.

The implementation of the optimisation principle is verified during the systematic QA/QC internal reviews.

In the general national legislation as well as in the regulations and guidelines issued by Ministry of Health and SÚJB there are specific provisions for the type of documents and the period of their record keeping. All records related to radiation protection are kept for 10 years and all medical records for 30 years. The fact that the application of QA/QC systems is mandatory and is subject to inspection assures the effectiveness of the documentation and record keeping. During site visits in the hospitals, the IRRS Team members observed good documentation control and record keeping by the licensees and SÚJB.

IRRS Team members acknowledged the excellent collaboration between SÚJB and SÚRO as a TSO. The added value of SÚJB's commitment to the continuous improvement of the safety culture within the medical sector was acknowledged during the site visits.

11.2. OCCUPATIONAL RADIATION PROTECTION

Legal and regulatory framework

An adequate and functioning legislative and regulatory framework to provide for occupational radiation protection has been established within the Czech Republic. It is mainly based on the Radiation Protection Regulation under the Atomic Act, although a number of elements derive directly from the general Labour Code.

There are a number of areas in which the Czech Republic is yet to adopt the new Basic Safety Standards, GSR part 3. Dose limits in line with the international requirements are specified, except for the lens of the eye, where the Czech Republic is using an annual dose limit of 150mSv for adults and 50mSv for apprentices and students between 16 and 18 years old. This deviation from the international requirements was identified by SÚJB during the self-evaluation. Additionally, with respect to the equivalent dose limit applicable to the skin, the Czech regulation does not specify that it is applicable to the most exposed part of the skin. Furthermore, in the Czech Republic, the dose limits for apprentices and students are applicable from the start of the year that the apprentices or students will attain the age of 16 years.

Nevertheless, the regulations foresee that in case an ionising radiation source can cause a single exposure exceeding 5 times the annual dose limit for exposed workers, the operational monitoring should be such that it allows determination of the dose and the dose distribution in the worker's body to allow for a reconstruction of the accident. Some examples were discussed, e.g. using multiple dosimeters distributed to higher irradiated parts of the body and using on-line dosimetric systems allowing a dosimetric follow-up with a high temporal resolution.

The regulatory framework requires SÚJB to review all supporting documents before authorising new or modified practices. It also requires the enforcement of the requirements for monitoring and recording occupational exposures. As a result of this requirement, SÚJB is maintaining a detailed and highly effective register containing all occupational doses since 1997. During a demonstration of the system, it was noted that a correction factor is being applied systematically to the doses higher than 20mSv registered in radiology to take into account that the dosimeter is being worn above the lead apron, as required by regulations. This correction factor takes only into account the energy of the contributing photons and the thickness of the lead apron. This type of correction is however not systematically being applied in all cases where a lead apron is worn. However, there is a Guide issued by SÚJB recommending that it be applied to doses higher than 10mSv.

The regulations do not foresee that the exposure of workers undertaking remedial actions in existing exposure situations are to be controlled in accordance with the requirements for occupational exposures in

planned exposure situations. This is a direct result of the fact that the concepts of planned and existing exposure situations have not yet been implemented in the legal and regulatory framework of the Czech Republic. However, current remedial actions are being licensed as a practice. This way the related exposures are controlled as occupational, hence implementing the requirement indirectly.

The regulatory framework establishes a strategy for occupational radiation protection against the exposure to radon in workplaces and a reference level of 400Bq/m³ is established.

General responsibilities of registrants, licensees and employers

The regulations define and assign the responsibilities for the protection of workers, occupational exposure and for compliance with the requirements of these regulations to the licensees.

The regulations require licensees to ensure that occupational exposure is controlled so that the dose limits are not exceeded, except for workers exposed to radiation from sources not required or not directly related to their work. In this case the regulations do not specify explicitly that the activity should be regulated in accordance with the requirements for public exposure. The Labour Code however contains the requirement to reduce the number of workers exposed to occupational hazards to the minimal practicable number. As a result, when a worker is exposed incidentally to radiation during employment it is not considered an occupational exposure.

The regulations require that occupational protection and safety is optimised and that exposures are kept as low as reasonably achievable. The concept of a dose constraint is being implemented as a high general investigation level valid for all applications and practices, instead of being a source specific value, used for optimisation of the radiation protection of a single source.

Action levels are set for contamination levels in the workplace, on the body and on protective clothing of workers. Although this could be seen as a good practice in itself, the IRRS team suggests to explicitly exclude removable contamination.

The requirement to give priority to safety by design and technical measures within the hierarchy of protective measures for controlling occupational exposure is addressed in the Labour Code.

The regulations require legal persons to give all necessary importance to safety. However, the promotion of a safety culture is not addressed by the regulations.

General Responsibilities of workers

Given the precise formulation of the competences of SÚJB, the Legislative Council of the Czech Republic ruled that SÚJB has no authority over individual workers. As a result, no requirements specifically related to occupational exposure control are present in the regulations issued by SÚJB. However, the general Labour Code specifies in very general terms the obligations and responsibilities of workers in general. These legal dispositions cover the international requirements in the field of occupational exposure, although they do not make a specific reference to them. As a consequence, in order to impose responsibilities upon workers, SÚJB imposes requirements on the employer to ensure that employees fulfil their safety obligations.

Requirements for radiation protection programmes

Licensees are required to designate the relevant areas of their workplaces as controlled or supervised areas and to establish the necessary infrastructure and procedures or local rules for keeping exposures under control. However, the requirement to have a suitable storage area for personal clothing at entrances to controlled areas is not explicitly present in the regulations.

Licensees are required to establish and maintain a programme for workplace monitoring that has to be approved by the regulatory body.

In the Czech Republic two systems exist under the Labour Code providing for additional payment for work in an ‘arduous working environment’ and additional holidays for work ‘harmful to the worker’s health’ (sections 117 and 215 of the Labour Code and Government Decree No. 567/2006 Coll.). The definition of an arduous working environment is clearly hazard-based and includes presence at the workspace of e.g. dust, noise, chemicals, carcinogens and ionising radiation. Specifically for the ionising radiation hazard, all category A workers performing radiation work in a controlled area are eligible, irrespective of the actual working conditions. For the implementation of the system of additional holidays, work harmful to health is considered to include exposure to a direct risk of infection, attending to patients suffering of contagious tuberculosis, attending to the mentally sick and being exposed to adverse effects of ionising radiation at work. It is stressed by SÚJB that the legal basis for these additional payments and holidays does not allow employers to use these as a substitute for protection and safety measures, as is covered to some extent by the provision of section 103 (1)(k) and 104 (5) of the Labour Code. In spite of this, SÚJB has found it necessary to make a formal statement that these financial and social benefits for work in a hazardous working environment are not radiation protection measures and cannot be seen as such by the employers. SÚJB continued its formal comment by stating that proposals for social measures and salary rises should be subject of negotiation between employee and employer representatives. The IRRS team considers that the above-mentioned systems, solely based on the presence of occupational hazards, may have an adverse impact on the credibility of the system of nuclear and radiation safety. The team reiterates that the total set of safety measures, as they are required by the legal and regulatory framework, are being provided for in order to make radiation work as safe as any other type of work. For this reason, the IRRS team decided to make a recommendation to the Government of the Czech Republic to ensure that the conditions of service of workers are independent of whether they are or could be subject to occupational exposure to ionising radiation.

Monitoring programmes and technical services

There are several organisations active in individual exposure monitoring: 5 perform measurement of external doses (of which 2 offer their services nationwide), 3 perform internal dosimetry and 10 institutes are active in the field of natural radioactivity. This is currently covering the needs of the country.

The service providers for individual monitoring, calibration services and workplace monitoring require a license from both SÚJB and the Czech Metrology Institute. The responsibilities of these licensing organisations are clearly defined.

The organisations offering training services for personnel which have a direct responsibility for radiation protection (RPO) and for supervising personnel (RPE) require approval by SÚJB.

Site visit to an industrial U mining and milling facility

Some members of the IRRS team accompanied two inspectors from SÚJB during an inspection of the uranium mining and milling facility GEAM at Dolní Rožínka operated by the state enterprise DIAMO. The purposes of this visit were related to the following issues:

- Progress in implementation of the remediation projects of the tailing ponds after completion of the activities;
- Verification of the on-going remediation activity (covering of surface with a protection layer of soil, installation of an anti-erosion layer and grass planting);
- Verification of the technology for water decontamination used in the cycle of “yellow cake” production;

- Verification of the activities to be performed by the operator (DIAMO) in the frame of the Environmental Monitoring Programme approved by SÚJB and demonstration of monitoring stations installed around the tailings pond in use;
- Inspection of the occupational exposure conditions of the workers in the R-7S shaft of the uranium mine.

The inspection was conducted in a professional and knowledgeable manner by the SÚJB inspectors. In particular it was noted that the inspectors performed several independent measurements of the radiation levels and the radon concentrations present at the working places.. Given the specific conditions of the mining and milling facility, no separate discussion with the licensee representatives took place.

| RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES | |
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| | Observation: The Czech Republic has a system of benefits for workers based on the presence of certain occupational hazards at the workplace where arduous working conditions, as defined by the legislation, exist, which also include work with radiation in a controlled area. This may have an adverse impact on the credibility of the system of nuclear and radiation safety. |
| (1) | BASIS: GSR part 3 Para. 3.111 states that <i>“The conditions of service of workers shall be independent of whether they are or could be subject to occupational exposure. Special compensatory arrangements, or preferential consideration with respect to salary, special insurance coverage, working hours, length of vacation, additional holidays or retirement benefits, shall neither be granted nor be used as substitutes for measures for protection and safety in accordance with the requirements of these Standards.”</i> |
| R16 | Recommendation: The Government should ensure that the conditions of service of workers shall be independent of whether they are or could be subject to occupational exposure and that there can be no substitute for measures for protection and safety. |
| | Observation: The annual equivalent dose limit to the lens of the eye is 150mSv (adults) or 50mSv (apprentices and students between 16 and 18 years of age); the regulations do not foresee that the exposure of workers in remedial actions are controlled as occupational exposures in planned exposure situations; the promotion of safety culture is not required by the regulations; it is not specified that the equivalent dose limit to the skin is applicable to 1 cm ² of the most exposed part of the skin; dose limits for apprentices and students are already applicable before they become fully 16 years of age; suitable storage for personal clothing at the entrances to controlled areas are not explicitly required in the regulations. |
| (1) | BASIS: GSR Part 3 Schedule III-1 states that <i>“For occupational exposure of workers over the age of 18 years, the dose limits are: (b) An equivalent dose to the lens of the eye of 20mSv per year averaged over 5 consecutive years (100mSv in 5 years) and of 50mSv in any single year”</i> |
| (2) | BASIS: GSR Part 3 Schedule III-2 states that <i>“For occupational exposure of apprentices of 16 to 18 years of age who are being trained for employment involving radiation and for exposure of students of age 16 to 18 who use sources in the course of their studies, the dose limits are: ... (b) An equivalent dose to the lens of the eye of 20mSv in a year;”</i> |
| (3) | BASIS: GSR Part 3 Para. 5.26 states that <i>“Employers shall ensure that the exposure of workers undertaking remedial actions is controlled in accordance with the relevant requirements for occupational exposure in planned exposure situations established in Section 3.”</i> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (4) | <p>BASIS: GSR Part 3 Para. 3.76 states that “Employers, registrants and licensees shall ensure, for all workers engaged in activities in which they are or could be subject to occupational exposure, that:</p> <p>(k) Necessary conditions for promoting a safety culture are provided.”</p> |
| (5) | <p>BASIS: GSR Part 3 Schedule III-1.c states that “The equivalent dose limits for the skin apply to the average dose over 1 cm² of the most highly irradiated area of the skin.”</p> |
| (6) | <p>BASIS: GSR Part 3 Para. 3.90 states that “Registrants and licensees:</p> <p>(f) Shall provide, as appropriate, at entrances to controlled areas:</p> <p>(iii) Suitable storage for personal clothing;”</p> |
| | <p>Recommendation of the IRRS Team related to this issue is given in items c) through h) of the general Recommendation related to compliance with GSR Part 3 at the end of the chapter.</p> |

11.3. CONTROL OF DISCHARGES, MATERIALS FOR CLEARANCE, AND CHRONIC EXPOSURES; ENVIRONMENTAL MONITORING FOR PUBLIC RADIATION PROTECTION

Control of radioactive discharges and materials for clearance

General safety rules for radionuclide discharges control are given in the Atomic Act and in the Decree on Radiation Protection No. 307/2002 (Radiation Protection Decree): “The dose constraint for a total discharge of radioactive substances from a workplace where radiation activities are performed shall be an average effective dose of 0.25mSv per calendar year for the appropriate critical group of the public, from which 0.2mSv shall be for discharges into the atmosphere and 0.05mSv for discharges into watercourses from nuclear installations”. Limits for authorized discharges from different types of facilities (NPP’s, mining and milling uranium facility) are established in the licences issued by SÚJB. As stated in the Annex H of the Atomic Act, such limits should be presented to SÚJB by the applicant as a part of a set of documents for issuing a “License on radioactive discharge into the environment”. SÚJB provided licence applications for discharge, to the IRRS Team. These demonstrated the process and indicated that the Atomic Act and Decree requirements were being implemented in practice by DIAMO, the U mining and milling operator.

The regulatory system for exemption and clearance is established in the Radiation Protection Decree. Exemption and Clearance levels are also established in the Radiation Protection Decree (Tables in Annexes 1 and 2). The exemption levels established in the Table 1, Annex 1 of the Decree are identical with the levels given in the Table I-1 in the GSR-Part 3 (IAEA 2011) for exemption of moderate amounts of material. However, the exemption levels for bulk amounts of material are not yet established but these are planned to be implemented in the future. The clearance levels are based on the general requirement of 10µSv/y, however some differences in values of activity concentrations were noted with respect to Requirement 8 of GSR Part 3 (incl. Schedule I “Exemption and Clearance”).

Environmental monitoring

Regulatory requirements related to the programmes for source monitoring and environmental monitoring are established in the Atomic Act and the Radiation Protection Decree. Recording and reporting of the data in the framework of the programmes for source monitoring and environmental monitoring implementation and management are required in the Atomic Act and in Radiation Protection Decree.

Examples of Environmental Monitoring Programmes and Programmes for discharges monitoring including Reports developed by Licensee (DIAMO – operator of mining and milling facilities) were demonstrated.

Moreover SÚJB provides independent monitoring of the environment. For such purposes a special procedure has been developed by SÚJB for independent monitoring of discharges and for environmental monitoring.

Requirements for publishing and/or making available the results of source monitoring and environmental monitoring programmes are in the Atomic Act (SÚJB is obliged to give out information about the environment and access to information requested) and publish an annual report on its activities and submit it to the Government and to the public. Additionally SÚJB issues an Annual Report embracing results from source monitoring and environmental monitoring programmes and assessments of doses from public exposure.

SÚJB uses a powerful and comprehensive database system MonRaS (Monitoring of Radiation Situation) of radiation monitoring of the whole territory of the country. This system was implemented according to the requirement of the Decree No. 319/2002 Coll. on function and organisation of the National Radiation Monitoring Network (NRMN). As was mentioned in Chapter 10, this specific software is useful to support issues related to emergency response capabilities under emergency environmental working conditions. The system is maintained by qualified experts of SÚJB.

The database radiation monitoring system MonRaS enables the collection of data from all components of the NRMN (e.g. early warning system, foodstuff contamination, dose rate monitoring made by mobile groups, environmental samples, etc.), automatic receiving of measured data from the early warning system, measuring points of air contamination, etc. to the database, automatic sending of information and warning messages to an expert on duty and to other relevant personnel from regional and national organizations that may be involved during a radiation emergency. Data verification and assessment in “real time”, access of public to the data via web site of SÚJB, use of the data for evaluation of public exposure and for preparing recommendations for decision making regarding countermeasures during an extraordinary radiation event, export of the data for reporting etc. are also an integral part of the system.

Regulatory framework for the control of public exposure

The set of requirements needed for the control of public exposure is established in the Atomic Act and in Radiation Protection Decree.

Practical implementation of the principle of optimization was demonstrated in examples of optimization of dose exposures for Temelín NPP workers and for approval of levels for discharges of radionuclides into the environment for Temelín NPP based on past practical experience.

Radiation protection of visitors is implemented taking into account requirements established for safety rules to be followed in controlled/supervised areas. Special conditions for access to such areas are established by licence holders taking into account level of radiation risks.

Requirements for control of customer products are in place and established in the Atomic Act for authorization of customer products, “Adding of Radioactive Substances into Customer product during their manufacturing or preparation or export or import of such products” and further requirements are specified in the Radiation Protection Regulation. However, existing requirements do not fully comply with Requirements 33 of GSR Part 3.

Remediation safety requirements

The national strategy related to remediation is formulated in Governmental Resolution No. 244/1995 “The Uranium Industry Contraction Programme” and related to remedial activities in uranium mining and milling industry. In this Resolution the Government sets requirements and tasks for different authorities to be involved in implementation of remediation activity. The Ministry of Industry and Trade (MPO) authorizes all projects and their financing. The main task of SÚJB in the frame of “The Uranium Industry Contraction Programme” is to issue a License for DIAMO (License Holder) for decommissioning of number of sites and facilities that are a consequence uranium mining and milling.

The description of the remediation strategy in Czech Republic is described also in IAEA TECDOC N 1244 “Impact of new environmental and safety regulations on uranium exploration, mining, milling and management of its waste”.

Financial support is provided according to the specific documentation called “Actualization of the Uranium Industry Contraction Programme” which is prepared annually and submitted to the Ministry of Industry and Trade for its authorization. There is no definition of the term “remediation” in national legislation. There are no special requirements established for regulating remediation activities. Such facilities as mining and milling facilities are licensed by SÚJB according to the provisions given for decommissioning of Category III workplaces as required by the Atomic Act.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| | <p>Observation:</p> <ol style="list-style-type: none"> 1) The regulatory system for exemption and clearance is established in Section 5 (Exemption) and Section 57 (Clearance) in Radiation Protection Decree. Exemption and Clearance levels are established also (the Tables in Annexes 1 and 2 to Radiation Protection Decree). The exemption levels established in the Table 1, Annex 1 of the Decree are identical with the levels given in the Table I-1 in the GSR-Part 3 (IAEA 2011) for exemption of moderate amounts of material. However, the exemption levels for bulk amounts of material are not yet established. The clearance levels are based on general requirement of 10μSv/y, however some differences in values of activity concentrations were noted with respect to Requirement 8 of GSR Part 3 (incl. Schedule I “Exemption and Clearance”). 2) Requirements for control of customer products established in Sections 58, 59 “Adding of Radioactive Substances into Customer products” and “Services Significant from radiation protection viewpoint” do not fully comply with some Requirements 33 of GSR Part 3 (Interim Edition). |
| (1) | <p>BASIS: GSR Part 3 Req. 8 states that <i>“Exemption and clearance” states that: “The government or the regulatory body shall determine which practices or sources within practices are to be exempted from some or all of the requirements of these Standards. The regulatory body shall approve which sources, including materials and objects, within notified practices or authorized practices may be cleared from regulatory control.”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| (2) | <p>BASIS: GSR Part 3 Req. 33 Para. 3.141 states that “ <i>Providers of consumer products shall ensure that:</i></p> <p style="padding-left: 40px;"><i>(a) Where practicable, a legible label is firmly affixed to a visible surface of each such consumer product that:</i></p> <p style="padding-left: 80px;"><i>i. States that the product contains radioactive substances and identifying the radionuclides and their activities;</i></p> <p style="padding-left: 80px;"><i>ii. States that the provision of the product to the public has been authorized by the regulatory body; (iii) Provides information about required or recommended options for recycling or disposal;</i></p> <p style="padding-left: 40px;"><i>(b) The information specified in a) above is also printed legibly on the retail packaging of the consumer product.”</i></p> |
| (3) | <p>BASIS: GSR Part 3 Req. 33 Para. 3.142 states that “<i>Providers of consumer products shall provide clear and appropriate information and instructions with each such consumer product on:</i></p> <p style="padding-left: 40px;"><i>(a) Correct installation, use and maintenance of the product;</i></p> <p style="padding-left: 40px;"><i>(b) Servicing and repair;</i></p> <p style="padding-left: 40px;"><i>(c) The radionuclides and their activities at a specified date;</i></p> <p style="padding-left: 40px;"><i>(d) Dose rates in normal operation and during servicing and repair;</i></p> <p style="padding-left: 40px;"><i>(e) (e) Required or recommended options for recycling or disposal.”</i></p> |
| | <p>Recommendation of the IRRS Team related to this issue is given in items i) and j) of the general Recommendation related to compliance with GSR Part 3 at the end of the chapter.</p> |
| | <p>Observation: In the regulatory system there is no definition of the term “remediation” and there are no special requirements for regulating of remediation activity established. Such facilities as mining and milling facilities are licensed by SÚJB according to provisions given for decommissioning of workplaces category III as required by the Appendix G of The Atomic Act.</p> |
| | <p>BASIS: WS-R-3 Para. 1.9 states that “<i>The purpose of this publication is to specify the safety requirements relating to the remediation of areas affected by radioactive residues as a result of uncontrolled events, such as accidents, and certain types of past activities.”</i></p> |
| R17 | <p>Recommendation: SÚJB should add the requirements related to remediation activity to the national legislation taking into account relevant statements established in WS-R-3 “Remediation of Areas Contaminated by Past Activities and Accident”.</p> |
| | <p>Observation: The Czech regulatory body uses a powerful and comprehensive database system MonRaS (Monitoring of Radiation Situation) on radiation monitoring of the whole territory of the country.</p> |
| (1) | <p>BASIS: GSR Part 3 Req. 32 states that “<i>The regulatory body and relevant parties shall ensure that programmes for source monitoring and environmental monitoring are in place and that the results from the monitoring are recorded and are made available.”</i></p> |

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

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| GP11 | <p>Good Practice: The database radiation monitoring system MonRaS enables:</p> <ul style="list-style-type: none"> • Collection of data from all components of the NRMN including foodstuff contamination, dose rate monitoring made by mobile groups and environmental samples, • Automatic sending of information and warning messages to an expert on duty and to other relevant personnel from regional and national organizations that may be involved during a radiation emergency, • Using the data for preparing recommendation on making decision about countermeasures in an extraordinary radiation event. |
|-------------|--|

At several points of this chapter reference is made to the general Recommendation below. At these points the Observations related to the issue, the IAEA safety standard requirements or guidance forming the Bases for the recommended actions and reference to the particular issues in the Recommendation below are given and shall not be repeated here.

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| R18 | <p>Recommendation: The regulatory body should revise the current legal and regulatory framework to bring it in line with the requirements of GSR Part 3, including the following issues:</p> <ol style="list-style-type: none"> a) complete the process for the determination of national DRLs for the remaining diagnostic procedures (interventional radiology, interventional cardiology, paediatric CT); b) require registrants and licensees that signs in appropriate languages are placed to request female patients undergoing a radiological procedure to notify, in case of pregnancy or breast feeding (for nuclear medicine); c) revise the equivalent dose limit for the lens of the eye; d) specify that the equivalent dose limit to the skin is to be applied to the most highly irradiated area of the skin; e) review the precise formulation for the dose limits applicable to apprentices and students younger than 18 years of age; f) implement the concepts of existing and planned exposure situations and require that doses of workers during remedial actions in existing exposure situations are controlled by the requirements for occupational exposures in planned exposure situations; g) implement the concept of safety culture and require that the necessary conditions to promote a safety culture are provided. h) require explicitly that registrants and licensees shall provide, as appropriate, suitable storage for personal clothing at entrances to controlled areas where there is a risk for radioactive contamination; i) update the exemption levels for bulk amount of materials and clearance levels; j) update the existing regulations on consumer products. |
|------------|--|

11.4. SUMMARY

The legislative and regulatory framework of the Czech Republic in the field of radiation protection is in place and well-developed. There is however a discrepancy with respect to the requirements of GSR Part 3, in particular for planned and existing exposure situations mainly with respect to occupational and public exposure. The legislative framework regarding medical exposure and its level of implementation is well advanced. The above mentioned discrepancies should however be resolved during the transposition of the new EURATOM BSS, which is expected to be published in early 2014.

The Czech Republic has a system of benefits for workers based on the presence of certain occupational hazards at the workplace which include work with radiation. This may have an adverse impact on the credibility of the system of nuclear and radiation safety. For this reason it is recommended to the government of the Czech Republic to ensure that the conditions of service of workers shall be independent of whether they are or could be subject to occupational exposure.

Requirements related to the control of discharges and environmental monitoring have been established. These are implemented in practice and are used for the optimisation of discharge levels.

The national strategy related to the remediation situation is developed and remediation projects are underway. However, the national legislation should be updated taking into account the requirements of WS-R-3.

12. REGULATORY IMPLICATIONS OF THE TEPCO FUKUSHIMA DAI-ICHI ACCIDENT

12.1. IMMEDIATE ACTIONS TAKEN BY THE REGULATORY BODY

On the day of the TEPCO Fukushima Dai-ichi accident the emergency team of SÚJB was activated and requested to evaluate the accident situation in Japan. The evaluation and assessment work was assisted by experts from the Řež Research Centre and from the National Radiation Protection Institute (SÚRO). Following the first activation the radiation status in Japan and its consequences in the Czech Republic were analysed and reported with a frequency of twice a day. This frequency was reduced to two times a week in parallel with the stabilization of the situation in Japan. SÚRO prepared and published daily summaries of the accident related events of the previous day. Up-to-date information on the accident progression was published daily on the SÚJB website.

The frequency of taking air-samples at the operating Czech power plants was increased and the results of the countrywide environmental and radiation monitoring were made public through the websites of SÚJB and SÚRO.

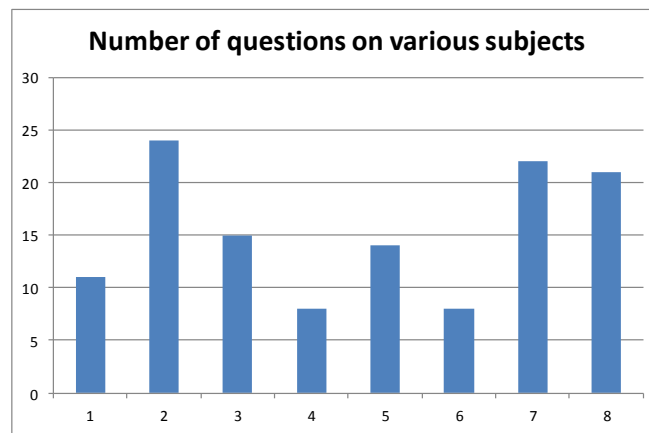
As an immediate action resulting from the accident SÚJB emergency response centre was provided with a satellite phone, battery-operated lamps and manual phone chargers in order to make their activity possible in case of loss of electrical power.

As the accident posed no direct threat on Czech Republic the most important task of SÚJB was the professionally correct explanation of the events to the government, to the media and to the public. For this purpose SÚJB took advantage of the majority of the available reliable information sources including the Incident and Emergency Centre of IAEA, the CTBT monitoring network, measurements performed at the French embassy in Tokyo and the official Japanese communication.

Similar to most European countries the communication pressure on SÚJB was rather high. The Chairperson of SÚJB was a frequent invitee of the mass media and also was tasked to inform high level governmental organs on the events and consequences of the accident. The Chairperson was in direct contact with the government at the time of the highest public interest and she appeared together with the Prime Minister at a press conference informing the public on the governmental position related to the accident. The government considered SÚJB as a reliable source of information in nuclear emergency matters. Links to the SÚJB media appearances were available from the SÚJB website. SÚJB also organized a forum with participation of governmental departments and the Office of the Government of Czech Republic in July 2011 in order to provide information on the accident.

An outstanding and rather efficient way of interaction with the public was realized via a dedicated webpage of the SÚJB website, where any reader might pose questions on any issue related to the accident and received answers through the same webpage usually within 24 hours but no later than within 72 hours. Between March and September 2011 altogether 335 questions related to nuclear safety issues in connection with the accident were received and answered by SÚJB experts. As for direct contacts with the public, there were 200 telephone calls and 63 e-mail inquiries with SÚJB and 70 e-mail contacts with its TSO during the first three months after the accident. The figure below gives an impression on the distribution of the questions posed through the web-site discussion forum during the first six months after the accident.

- 1 iodine prophylaxis
- 2 import shipments and checks at border crossing
- 3 radioactive particles in air
- 4 radiation situation in the CR
- 5 radiation situation in Japan
- 6 stay in Japan
- 7 stay abroad
- 8 general questions



The website of SÚJB provided full coverage of the events and issues of interest related to the accident. The number of different visitors of the SÚJB website two months after the accident was about six times higher than before the event, whereas the number of visits increased by a factor of sixteen during the same period.

The following data may characterise the media presence of SÚJB: SÚJB and SÚRO senior experts appeared in TV programmes about 15 times, in radio programmes about 20 times. The SÚJB website that regularly updated the information on the accident progression as well as the interactive webpage were regularly referred to by the press. Press release issued by SÚJB was forwarded to the media by the Czech News Agency.

SÚJB kept contact with the Czech embassy in Tokyo and provided advice to the Czech citizens in Japan on travel and radiation protection matters. Potassium iodine pills were sent to the embassy for the case of possible deterioration of the radiological situation but ultimately they were not distributed. Food, animal and goods arriving from Japan to the Czech Republic were monitored for radioactivity, yet no excessive radiation level was detected.

SÚJB kept contact with the international organizations such as the IAEA, OECD NEA and the EU at the time when information exchange and data update on the accident were essential.

Public opinion polls were conducted soon after the accident that have shown that confidence in the safe use of atomic energy and in the activity of the regulatory body remained at a high level among the Czech citizens. Specifically, in a poll conducted in March 2011, a week after the accident 69% of the answers declared trust in the safety of the Czech nuclear power plants, more than 60% were at the opinion that further development of the nuclear energy capacity would serve ecologically clean energy production purposes and 55% thought that the independent, self-satisfying Czech energy policy should rely on nuclear energy. More than 67% of the answers expressed confidence in the statement by the SÚJB Chairperson that the application of nuclear energy in the Czech Republic is safe. Note at the same time that the majority of the answerers felt under-informed in nuclear matters. Another poll was conducted in April 2011 and the opinion was compared to a previous one taken in the nineties. This poll demonstrated that the trust in safe nuclear energy increased to 61% in 2011 from 59% in 1993 and 56% in 1995.

Licensees were not requested by SÚJB to take special measures immediately after the accident, whereas – at the initiative by WANO – a prompt revision of protection of the NPPs against the extreme conditions similar to those in Fukushima was conducted. This review did not identify any reason for immediate actions. Later on, SÚJB extended its standard inspection practice on inspection of activities and equipment having potential roles in coping with possible extreme conditions compromising nuclear safety.

12.2 TECHNICAL AND OTHER ISSUES CONSIDERED IN THE LIGHT OF THE ACCIDENT

SÚJB summarized the lessons learned from the accident approximately one year after the event. The summary concerned topics of emergency preparedness, public and media communication and international cooperation and communication. The conclusions can be briefly summarized as follows:

- In emergency preparedness a review of on-site and off-site emergency plans is needed, strategies for protection the population need reassessment and the technical and expert support need to be maintained
- In communication initiatives were put forward for educating SÚJB staff on media appearances, preparing educational material for the public and keeping close contact with the media
- In international cooperation enhancement of European regulatory coordination and communication was initiated and harmonization of emergency preparedness approaches was foreseen.

Implementation of the actions resulting from the prompt lessons learned above has been started. Revision of the on-site emergency plans (that has already been once performed) is underway. Updating of the off-site emergency plan of the Temelín NPP is completed and that of the Dukovany NPP is in progress.

In order to enhance public communication of SÚJB a dedicated expert was employed, who is responsible for the communication of SÚJB and who is under direct supervision by the Chairperson of SÚJB. Preparation of educational material for communication purposes has also been initiated.

Czech Republic participated in the European Stress Test initiative for the re-evaluation of the safety and safety margins of the nuclear power plants in the light of the accident. The re-evaluation was performed by the licensee for both nuclear sites and was submitted to SÚJB. The re-assessment included the review of design basis; compliance of the plants with it; robustness against beyond design basis accidents; and the possibility of maintaining the fundamental safety functions in case of extreme conditions.

TSO's of SÚJB evaluated the re-assessment reports and SÚJB developed the National Report on the Stress Test exercise and submitted it to the European Nuclear Regulators Group for review. The re-evaluation followed the ENSREG methodology and investigated the possible consequences of and protection against the usual phenomena of earthquakes; floods; other extreme external hazards; loss of fundamental safety functions; severe accident management; and emergency management and response.

The Czech National Stress Test Report concludes that *“In the majority of accident scenarios, external risk evaluation and analysis of safety margins against these risks proved that the current design of both power plants provides sufficient margins in parameters and time needed for the personnel to react in order to avoid severe accidents”*. Although this conclusion does not call for any urgent intervention or action, the Report identifies a number of areas where enhancement of nuclear and radiological safety is feasible.

Typical (but not exclusive) examples of such areas and activities, identified for both nuclear power sites are:

- Damage mitigation guidelines for using alternative means of mitigation of consequences of extreme events
- Ability of emergency response organization to function outside the emergency control centre
- Analysis of shelter availability after extreme external events
- Possibility of ensuring sufficient number of personnel after extreme events

- Alternative ways of providing electricity, power source, cooling substance or heat removal
- Development of various procedures for emergency or severe accident management

The above and other foreseen activities and technical modifications were summarized in a National Action Plan (see also in the next section), also reviewed by the European nuclear community. Important issues from the Action Plan related to the activity of SÚJB are detailed in the next section. For more on the actions identified as necessary for safety enhancement, see the module-wise summaries in section 12.4.

It is definitely worth mentioning that the actions and related data stemming from the National Action Plan are stored and managed in a dedicated database of SÚJB. This database is equally meant for tracking the actions taken by the licensee and for data handling, scheduling, record keeping and reporting purposes. Use of the database was ordered by the SÚJB Chairperson and the potential users (inspectors) obtained education and training on its use. Note that there exists another database managed by the licensee that contains the respective Action Plan and related data from the point of view of the operators. It is remarkable that data from this database is also periodically provided to the SÚJB.

Note also that certain lessons learned from the accident have already been implemented into the actual regulatory practice. As an example, the IRRS Team was informed that the latest operational license of Unit 2 of the Temelín NPP, issued following the periodic safety review in 2012 contains as license conditions three requirements that are direct consequences of the lessons learned from the accident. These conditions include the requirement of extending the scope of the next PSR so that it takes into account the knowledge so far accumulated in connection with the accident, as well as the need to complete the actions set by the National Action Plan.

CONCLUSION [1]

The IRRS Team considers that SÚJB took appropriate actions in order to cope with the implications of the TEPCO Fukushima Dai-ichi accident. SÚJB was effective and efficient in public communication as well as in the management of the Stress Test process.

12.3 PLANS FOR UPCOMING ACTIONS TO FURTHER ADDRESS THE REGULATORY IMPLICATIONS OF THE ACCIDENT

Long term plans related to the implications of the accident on nuclear safety in the Czech Republic are summarized in the *National Action Plan (NAcP) on Strengthening Nuclear Safety of Nuclear Facilities in the Czech Republic*. The NAcP contains a compilation of all the major conclusions and recommendations contained in the National Stress Tests Report on nuclear power plants of the Czech Republic discussed in the previous section; reports from the peer review process of the Stress Test Report by the ENSREG group, as well as in the Final Summary Report of the 2nd Extraordinary Meeting of the Contracting Parties to the Convention on Nuclear Safety held in Vienna in 2012. The version valid at the time of the IRRS mission (Revision 1) was issued in July 2013.

The NAcP includes altogether 84 actions the majority of which assume the activity of the operators or the licensee. The actions are grouped according to their topics, the main groups are: natural hazard, emergency preparedness and response, severe accident management, design, and national organizations. Completion of the actions is supervised by SÚJB as described in the previous section. Some of the actions in the NAcP have already been completed, such as

- Preparation of procedures for managing extreme conditions at both sites
- Protection against flooding
- Ensuring availability of the regional weather forecasts and predictions for the shift engineer
- Issuance of a new procedure for coping with extreme conditions at sites (wind, temperature, snow, earthquake)
- Exclusion of the mid-loop modes of operation during shutdown unit state at the Temelín NPP
- Preparation and validation of procedures for the use of the safety DG of the other unit in case of an SBO. Assessment of seismic hazards of both sites

The majority of the actions are due by the end of 2015; however, there are actions that will be determined and scheduled only on the basis of results of analyses included and may be performed in a longer timeframe (e.g. method of corium stabilization at Temelín NPP).

Important developments have been decided in the severe accident management system. Thus, among others the following activities are foreseen

- Installing passive catalytic hydrogen recombiners in the containments of both NPPs
- In-vessel molten core retention by external cooling at the Dukovany NPP
- Maintaining long term containment integrity at the Temelín NPP
- Issuance of a new procedure for coping with extreme conditions at both sites
- Development of various accident management procedures and guidelines
- Analysis of habitability of the main and emergency control rooms at both sites during severe accidents
- Analysis of severe accident scenarios based on the current "state of art" and on the results of experiments and research

A limited number of actions are in the responsibility of SÚJB. These include

- Revision of the legislation related to nuclear energy in order to reflect the new (not yet finalized) recommendations by WENRA, the informal association of European top nuclear regulators
- Enhancing transparency and openness of SÚJB in communication with the public and with the stakeholders
- Establishing the legal requirements for safety culture assessment and performing regular assessments
- Developing further the working relationship with the operators
- Regular updating of the emergency plan

The revision of the legal framework, with main emphasis on the issuance of a revised Atomic Act and the associated SÚJB Decrees is scheduled to 2015. All other actions are foreseen on a continuous basis.

No action specific to the core activities, working method or regulatory practice of SÚJB is included into the Action Plan that indicates that SÚJB and all participants of the Stress Test process are satisfied with the actual regulatory methods and practice of SÚJB.

CONCLUSION [2]

The IRRS Team concludes that the possible implications of the TEPCO Fukushima Dai-ichi accident on nuclear and radiation safety in the Czech Republic were thoroughly assessed and the actions that may further enhance the nuclear and radiation safety in the country in general and the safety of the operating nuclear power plants in specific were determined and scheduled for realization in an Action Plan. SÚJB is in the position to thoroughly supervise, and, if necessary, enforce the action in the Action Plan. No short or medium term change in the nuclear and radiation safety regulatory practice was deemed necessary as a consequence of the lessons learned from the accident.

12.4 CONCLUSIONS BY REVIEWED AREAS

Note: The significance of Fukushima implications was considered as part of the review of each IRRS module. The review conclusions below and the plans presented by the Czech Republic to further address TEPCO Fukushima Dai-ichi issues in the coming years should be included in the scope of the follow-up IRRS mission to be invited by the Czech Republic.

Module 1: Responsibilities and Functions of the Government

Responsibilities are given to SÚJB within the legal and regulatory framework to regulate nuclear safety and radiation protection under all exposure situations. Personnel involved in the Integrated Rescue Service have adequate dosimetry. SÚJB has a well-defined role within the Integrated Rescue Service. Authorised operators have clear responsibilities in emergency exposure situations consistent with the EC Directive on Nuclear Safety which has been transposed into the Czech legislation. SÚJB has direct access to the Cabinet in all exposure situations and the safety framework ensures effective independence in all cases.

Operators are required to provide adequate occupational dosimetry service in the event of emergency exposure situations. Governmental provisions are not made to ensure the availability of personal internal dosimetry service for the public. Dosimetry for the public is provided by the early warning network complemented by teledosimetric systems in the vicinity of Dukovany and Temelín nuclear power plants. The equipment of the early warning network and teledosimetric systems allows continuous measurement of photon dose equivalent rates at 135 locations in the Czech territory (of which 51 locations are part of the teledosimetric system networks in the immediate vicinity of nuclear power plants and 15 locations in the surroundings of nuclear power plants). SÚJB informs the public on radiation situation and its consequences to the radiation safety.

CONCLUSION [3]

The IRRS Team considers that with respect to the governmental responsibilities and legal framework implications of the TEPCO Fukushima Dai-ichi accident no concern is raised.

Module 2: Global Nuclear Safety Regime

The Czech Republic has ratified all relevant international conventions. The Czech Government (represented also by SÚJB) is an active participant in the CNS review meetings and its 2013 Report is comprehensive. SÚJB is the contact point within Czech Republic and has excellent communications with the IAEA and with the EC. The Czech Government is an active participant in international peer review missions.

CONCLUSION [4]

The IRRS Team considers that the Czech Republic in general and SÚJB in specific are active participants of the international co-operation in nuclear safety and the TEPCO Fukushima Dai-ichi accident raised no concern whatsoever in this respect.

Module 3: Responsibilities and Functions of the Regulatory Body

SÚJB is an independent state administration body in the field of nuclear safety and radiation protection. SÚJB is entitled by the law to intervene without being influenced by the cost implications on the authorized party.

Following the TEPCO Fukushima Dai-ichi accident, SÚJB reacted promptly and duly as described in section 12.1.

SÚJB requested the NPP operator to perform EU stress tests of both nuclear power plants (Dukovany NPP and Temelín NPP). An independent assessment of results was carried out. An Action plan for the implementation of identified corrective measures has been set up. Implementation of actions is enforced through the licence conditions (c.f. sections 12.2 and 12.3).

In case of an extraordinary event in Czech Republic immediate notification has to be provided to the SÚJB by the operator. In the case of a natural disaster the availability of means of communication to reach the local population had been investigated in the context of EU Stress Tests and appropriate improvements, such as alternative means for internal and external communication, notification and warning of staff and population during loss of existing infrastructure, have been identified and included in National Action Plan (NAcP) for future implementation.

In relation to information on radiation risks and protective measures emergency plans envisage that urgent measures (i.e. sheltering and iodine prophylaxis) are automatically applied to the full emergency planning zone once warning sirens are activated. The iodine prophylaxis measures are executed on the basis of pre-prepared instructions, which are broadcasted on TV and radio. Every citizen in the emergency planning zone and every workplace are provided with a sufficient amount of potassium iodine to ensure iodine prophylaxis. The “evacuation” protective measure is implemented based upon the decision of the Governor, (as an administrative act) of the affected region/regions based on evaluation of the monitoring of the radiation situation in the emergency planning zone and on recommendation of the SÚJB or based upon decision of the Government, if it has taken over the coordination function of the emergency response.

Regarding coordination for public information in case of extraordinary events, the Government sets up the Central Crisis Staff which include a professional media group. The central offices employ press persons to inform the public, or set up their media groups. Every central office, including SÚJB, is then responsible for its own information campaign.

CONCLUSION [5]

The IRRS Team considers that SÚJB has committed to act in requiring and enforcing the safety enhancement measures decided in the light of the TEPCO Fukushima Dai-ichi accident. In most issues the existing status is appropriate, in a few issues further actions have been planned and are being implemented.

Module 4: Management System of the Regulatory Body

After the TEPCO-Fukushima Dai-ichi accident, SÚJB has created a task force with the goals to identify any gaps and opportunities for further improvement. A review of the SÚJB management system has been performed and a set of actions for improvement of the management system has been identified with the aim of the harmonisation with the IAEA safety standard GS-R-3 requirements.

The management system of SÚJB will be subjected to a continuous improvement programme making use of the current IAEA safety standards as well as of the results of specific management processes such as self-assessment, independent assessment and management system review, conducted at regular intervals, with the aim to identify any non-conformances and the associated corrective actions and opportunities for improvement.

CONCLUSION [6]

The IRRS team concludes that SÚJB has reviewed its management system in the light of the TEPCO Fukushima Dai-ichi accident and a set of actions for improvement of the management system has been identified and are planned for implementation.

Module 5: Authorization

Following the TEPCO Fukushima Dai-ichi accident, SÚJB required the Czech utility to perform reassessment in various areas in the light of the EU Stress Test requirements. On the bases of these assessments an action plan has been developed which include various actions (e.g. at the Dukovany site improved protection against flooding at the site, extension of capacity of hydrogen recombiners, additional emergency feedwater pump, see also section 12.3). Implementation of the action plan is a condition for the utility to obtain approval for continued operation after expiration of the current operational license (2015 for Dukovany NPP).

Some of the modifications will be performed on the basis of an approval issued by SÚJB.

SÚJB is currently drafting the Atomic Act and the implementing decrees. SÚJB has identified certain areas to improve regulations. Related to the authorization process new Act and decrees will provide the necessary legislative basis and content for conducting periodic safety reviews.

CONCLUSION [7]

The IRRS Team considers that SÚJB has an adequate authorization process in place both to enforce necessary safety improvements as well as to authorize their implementation. SÚJB and the Czech NPP operator have participated in the EU level Stress Test exercise and safety enhancement needs have been identified and partly implemented at the NPPs. Further actions are needed and are suggested to enhance safety as well as to develop the legislative framework for e.g. conducting periodic safety review of the NPPs in Czech Republic.

Module 6: Review and Assessment

As mentioned above several times, in the EU level Stress Test exercise a specific action plan has been established to enhance safety of the NPPs, in particular to ensure core and fuel cooling and confinement of radioactive material in design basis as well as in design extension conditions.

SÚJB has identified deficiencies in the current Atomic Act and relevant decrees e.g. in addressing design extension conditions, including severe accidents as well as on the use of probabilistic safety assessment

and periodic safety reviews. Currently these gaps are filled with setting specific license conditions on the NPPs. To update and improve the legislative basis, SÚJB is in a process on renewing the Atomic Act as well as the decrees by 2015. In addition to legislative basis, also related regulatory guides as well as internal SÚJB documentation will be updated and established for further guidance both to utility and SÚJB.

CONCLUSION [8]

The IRRS Team considers that SÚJB and the utility have conducted a Stress Tests exercise to assess the safety of Czech NPPs against extreme external events, loss of safety functions and severe accidents. Further actions are needed and suggested to ensure the adequacy of legislative basis and enhancement of safety by setting in force the new Atomic Act and the decrees.

Module 7: Inspection

SÚJB has conducted inspections to review the implementation of actions specified in the National Action Plan (NAcP). Periodic resident and specialist inspections have been completed to verify the operator's improvements to safety systems, and fire brigade and operator actions and procedures related to accident management to date. Several of these modifications were underway prior to the TEPCO Fukushima Dai-ichi accident. During a site tour of the Dukovany NPP by members of the IAEA Team, SÚJB oversight of the licensee's implementation of NAcP actions was noted, including enhancements and new construction on the emergency feedwater system and the installation of flood protection barriers for the emergency diesel generators and the plant auxiliary building. Observation by the SÚJB resident and specialist inspection staff of on-going modifications to the hydrogen recombiner system and broader oversight of the conduct of the European Stress Tests were discussed. SÚJB management confirmed that the inspections of these actions are documented in related inspection reports.

SÚJB has not revised its formal inspection programme in response to the lessons learned from the TEPCO Fukushima Dai-ichi accident. SÚJB utilized existing inspection programme doctrine for these oversight activities and issued programme directives to its inspection staff in the conduct of oversight activities related to the NAcP. SÚJB plans to continue inspections to verify that the operators have properly implemented the planned modifications following from the stress test conclusions.

CONCLUSION [9]

SÚJB has conducted inspections to verify the implementation of measures taken to date by the operator in response to the TEPCO Fukushima Dai-ichi accident. The IRRS Team concludes that the formal inspection programme could be reviewed for enhancement and for the incorporation of relevant inspections and programme directives that have been issued to verify the modifications to systems and procedures by the operator. The IRRS Team considered that SÚJB is committed to act as necessary.

Module 8: Enforcement

SÚJB is empowered to impose corrective measures and enforce their adoption, including sanctions in the case of failure to observe the measures by the Atomic Act and the Act on State Inspections. The schedule for the corrective actions as based on the proposal by the licensee has been approved by SÚJB, and is included in the NAcP. The licensee's action plan has been submitted to SÚJB, and its fulfilment is imposed by a condition of authorization for operation. Completion times for implementation are being monitored. The IRRS team concludes that SÚJB is fully capable to implement the enforcement process

with independency and authority in the case of any implication of the TEPCO Fukushima Dai-ichi accident.

CONCLUSION [10]

The Team concluded that SÚJB has demonstrated its ability to impose corrective actions related to the TEPCO Fukushima Dai-ichi accident and that the regulatory body is committed to act as necessary.

Module 9: Regulations and Guides

In the aftermath of the TEPCO Fukushima Dai-ichi accident, SÚJB was able to act immediately and appropriately on the basis of the Atomic Act as described in sections 12.1 through 12.3 and in connection with the Modules above.

SÚJB took active part in the European Stress Test including the development of a National Action Plan on Strengthening Nuclear Safety in the Czech Republic (NACp). Reviewing and possible revision of legislation in the field of nuclear energy is also scheduled in the National Action Plan. The new Atomic Act and its regulations (SÚJB Decrees) are currently under development. One basis for this development of new legislations was among other also the lessons learned from the accident.

Implementation of actions for enhancement nuclear safety with respect to the TEPCO Fukushima Dai-ichi accident was enforceable as conditions to operating licence or even pre-condition for licence issuance. SÚJB required licensee to address the aspects related to the accident in the scope of subsequent Periodic Safety Review.

CONCLUSION [11]

The IRRS Team noted that the regulatory body participated in a “stress test”-type exercise. The necessary further actions have been initiated. The regulatory body is committed to act as necessary to renew the regulations and guidelines.

Module 10: Emergency Preparedness and Response

In the interviews, the IRRS Team noted that SÚJB has not yet integrated long lasting multiple releases of radionuclides into the threat assessment process that forms a basis of emergency preparedness and response.

For long lasting and/or repeated releases, the strategy for implementation of protective actions needs to be reviewed (e.g. regarding the intake of KI and the limited time of maximum 2 days for implementing sheltering) and eventually adapted. SÚJB has recognised the need for this but have not yet developed a protective measure strategy dealing with the long lasting and/or multiple releases of radionuclides.

The source term database of SÚJB in the decision support system ESTE and in the emergency action guides initially included only source terms of the reactor. After the TEPCO Fukushima Dai-ichi accident, it was updated to include also source terms in spent fuel pool accidents.

If protective measures have to be implemented outside the EPZ the strategy of SÚJB is to recommend sheltering.

Back-up Emergency Control Centres for Dukovany and Temelín NPPs are under construction as part of the implementation of the National Action Plan. According to this plan these centres will be operative by September 2014.

CONCLUSION [12]

The IRRS Team considers that SÚJB has recognised and partly taken necessary actions in response to the TEPCO Fukushima Dai-ichi accident. Appropriate actions have been taken by means of establishing a National Action Plan. SÚJB has already finalised some improvement measures in the field of EPR, and has recognised that the NPP threat assessment should include long lasting and/or multiple releases. SÚJB is also aware that the protective measures strategy needs to be reviewed and eventually adapted to such scenarios.

Transport of Radioactive Material

SÚJB has undertaken a preliminary review of the lessons learned from the Fukushima Daiichi Accident with respect to transport safety as indicated in the draft list of issues for TRANSSC consideration on the IAEA Transport Safety Standard. From the 16 items for initial review proposed in TRANSSC 24, the majority are considered within the scope of the national regulatory framework for transport safety, such as requirements on package cooling, tightness, gas generation etc. The additional remaining items were excluded from consideration as the environmental conditions during transport do not justify their detailed assessment. However, the impact of some of these items on transport safety may be further explored in SÚJB guidelines.

Based on this review the emergency response arrangements currently in place does not give rise to concerns on the ability of the current regulatory framework to prevent the occurrence of regulatory related shortcomings as identified in the light of the Fukushima accident with respect to the transport of radioactive material.

The emergency response organizations and personnel have an adequate level of preparedness so that they are ready to provide the necessary response to accidents including transport accidents involving all types of dangerous goods, including radioactive material. Emergency drills and exercises are conducted for transport of radioactive material.

CONCLUSION [13]

The IRRS review team considers that the Government is committed to act in the light of the Fukushima accident and that appropriate actions have been taken and emergency response systems are in place to deal with a transport related accident.

APPENDIX I – LIST OF PARTICIPANTS

| INTERNATIONAL EXPERTS | | |
|---------------------------------|---|--|
| 1. LACEY Derek | Office for Nuclear Regulation (ONR) | derek.lacey@hse.gsi.gov.uk |
| 2. JOHNSTON Peter | Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) | peter.johnston@arpansa.gov.au |
| 3. ALTORFER Felix | Swiss Federal Nuclear Safety Inspectorate (ENSI) | felix.altorfer@ensi.ch |
| 4. CIUREA-ERCAU Cantemir | National Commission for Nuclear Activities Control (CNCAN) | cantemir.ciurea@cncan.ro |
| 5. DUFFY Jarlath | Radiological Protection Institute of Ireland (RPII) | jduffy@rpii.ie |
| 6. HOFER Peter | Federal Ministry of Agriculture, Forestry, Environment and Water Management | peter.hofer@lebensministerium.at |
| 7. HOWARD Don | Canadian Nuclear Safety Commission (CNSC) | don.howard@cnsccsn.gc.ca |
| 8. KAMENOPOULOU Vasiliki | Greek Atomic Energy Commission (GAEC) | vkamenop@eeae.gr |
| 9. KILOCHYTSKA Tetiana | State Nuclear Regulatory Inspectorate of Ukraine (SNRC) | kilochytska@hq.snrc.gov.ua |
| 10. KRAFT Florian | French Nuclear Safety Authority (ASN) | florien.kraft@asn.fr |

| | | |
|---------------------------------|---|--|
| 11. LEE Jin-ho | Korea Institute of Nuclear Safety (KINS) | peacelee@kins.re.kr |
| 12. MARKKANEN Mika | Radiation and Nuclear Safety Authority (STUK) | mika.markkanen@stuk.fi |
| 13. MATTEOCCI Lamberto | Institute for Environmental Protection and Research (ISPRA) | lamberto.matteocci@isprambiente.it |
| 14. SONCK Michel | Federal Agency for Nuclear Control (FANC) | michel.sonck@fanc.fgov.be |
| 15. TIIPPANA Petteri | Radiation and Nuclear Safety Authority (STUK) | petteri.tiippana@stuk.fi |
| 16. TRACY Glenn | U.S. Nuclear Regulatory Commission (NRC) | glenn.tracy@nrc.gov |
| 17. UHRIK Peter | Nuclear Regulatory Authority (UJD) | peter.uhrik@ujd.gov.sk |
| 18. VAN LIMBORGH Anneke | Ministry of Economic Affairs | a.vanlimborgh@minez.nl |
| 19. WILDERMANN Thomas | Ministry of Environment, Climate Protection and the Energy Sector | thomas.wildermann@um.bwl.de |
| 20. RANGUELOVA Vesselina | Joint Research Centre - European Commission | vesselina.ranguelova@ec.europa.eu |

IAEA STAFF MEMBERS

| | | |
|---------------------------|---|--|
| 1. NICIC Adriana | Division of Nuclear Installation Safety | a.nicic@iaea.org |
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| 3. JONES Geoffrey | Division of Nuclear Installation Safety | g.jones@iaea.org |
| 4. LUX Ivan | Division of Nuclear Installation Safety | i.lux@iaea.org |
| 5. SALINAS Rodrigo | Incident and Emergency Centre | r.salinas@iaea.org |
| 6. DANI Mario | Division of Nuclear Installation Safety | m.dani@iaea.org |

LIAISON OFFICER

| | | |
|--------------------|--|--|
| TICHY Milos | State Office for Nuclear Safety (SÚJB) | milos.tichy@subj.cz |
|--------------------|--|--|

TEAM PHOTO



Second Week, 25 to 29 November

| | MON | TUE | WED | THU | FRI | |
|-------------|--|--|---|---------------------------------|---|--|
| 9:00-10:00 | Individual discussions of Rs, Ss and GPs with counterparts | Cross-Reading TL, DTL, TC and DTC read everything Finalisation | Common read through and finalisation by the Team Submission of the Draft to the Host | Discussion with Host | Submission of the Final Draft | 9:00-10:00 |
| 10:00-12:00 | | | | | Exit Meeting Press Conference | 10:00-12:00 |
| 13:00-15:00 | Policy Discussions | Discussion of the report by the team | TC, DTC prepare Executive Summary and exit presentation | Host reads Draft | Written comments by the Host Team meeting for finalisation of the Report | 13:00-15:00 |
| 15:00-17:00 | Individual discussions of Rs, Ss and GPs with counterparts | | | | | TL finalises Executive Summary and exit presentation |
| 17:00-18:00 | Daily Team Meeting | | | Discussion of Executive Summary | Briefing of the Director Finalisation of the press release | 17:00-18:00 |
| 19:00-21:00 | Secretariat includes changes | | | Secretariat finalises text | Free | Free |
| 21:00-24:00 | | 21:00-24:00 | | | | |

APPENDIX III – SITE VISITS

| Facilities visited: |
|--|
| 1. NPP Dukovany (Brandejs, Tipek, Lietava, Tippana, Tracy, Uhrik, Howard) |
| 2. Prague, Hospital IKEM, Intervention Radiology (Nožičková, Jursíková, Zachariášová, Kamenopoulu, Sonck) |
| 3. Pardubice, Dekra, Industrial Radiography (Pašková, Kropáček, Schmutzer, Markkanen, Shadad) |
| 4. Prague, Hospital Motol, Radiotherapy (Pašková, Štědrová, Kropáček, Markkanen, Shadad) |
| 5. Prague, Czech Technical University, Research Reactor VR-1 (Nekuža, Ratajová, Lee) |
| 6. Rožínka, Diamo, Remediation and Mining Facility (Jurda, Němec, Kilochytska, Shadad) |

APPENDIX IV – LIST OF COUNTERPARTS

| | IRRS EXPERTS | SÚJB Lead Counterparts |
|-----------|---|---|
| 1. | RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT | |
| | F. Altorfer, P. Johnston, M. Markkanen, A. Van Limborgh | D. Drábová, P. Krs, J. Chára |
| 2. | GLOBAL NUCLEAR SAFETY REGIME | |
| | F. Altorfer, P. Johnston, A. Van Limborgh | D. Drábová, P. Krs, J. Chára |
| 3. | RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY | |
| | C. Ciurea-Ercau, J. Duffy, L. Matteocci, T. Wildermann | D. Drábová, P. Krs, J. Chára |
| 4. | MANAGEMENT SYSTEM OF THE REGULATORY BODY | |
| | C. Ciurea-Ercau, L. Matteocci, T. Wildermann | D. Drábová, P. Krs, J. Chára |
| 5. | AUTHORIZATION | |
| | D. Howard, F. Kraft, J. Lee, M. Markkanen, P. Tiippana | P. Brandejs, J. Štuller, Z. Witkovský, J. Šípek, Nekuža, M. Ratajová, P. Lietava, V. Ducháček |
| 6. | REVIEW AND ASSESSMENT | |
| | D. Howard, F. Kraft, J. Lee, M. Markkanen, P. Tiippana | P. Brandejs, J. Štuller, J. Veselý, J. Šípek, M. Nekuža, M. Ratajová, P. Lietava, V. Ducháček |
| 7. | INSPECTION | |
| | J. Duffy, D. Howard, J. Lee, M. Markkanen, G. Tracy, P. Uhrík | Z. Típek, M. Nekuža, M. Ratajová, P. Lietava, V. Ducháček |

| | IRRS EXPERTS | SÚJB Lead Counterparts |
|-----|---|--|
| | ENFORCEMENT | |
| 8. | J. Lee, M. Markkanen, G. Tracy, P. Uhrík | Z. Típek, M. Nekuža, M. Ratajová, P. Lietava, V. Ducháček |
| | REGULATIONS AND GUIDES | |
| 9. | C. Ciurea-Ercau, J. Duffy, D. Howard, J. Lee, L. Matteocci, T. Wildermann | D. Drábová, P. Krs, T. Kadeřábek, J. Šípek, J. Chára, P. Lietava, V. Ducháček, Š. Kochánek |
| | EMERGENCY PREPAREDNESS AND RESPONSE | |
| 10. | P. Hofer, R. Salinas | V. Starostová, F. Koldus, M. Boďová, Z. Votruba |
| | CONTROL OF MEDICAL EXPOSURES, OCCUPATIONAL RADIATION PROTECTION, CONTROL OF DISCHARGES, MATERIALS FOR CLEARANCE AND CHRONIC EXPOSURES AND ENVIRONMENTAL MONITORING FOR PUBLIC RADIATION PROTECTION | |
| 11. | V. Kamenopoulou, T. Kilochytska, M. Sonck | K. Petrová, I. Zachariášová, Z. Pašková, J. Davidková, J. Kropáček, Vinklář, V. Štědrová, Schmutzer, Válek Č. Berčík, J. Nožičková, I. Horáková, H. Podškubková, A. Heribanová, J. Stěpánková, P. Papírník, E. Jursíková, P. Lietava, V. Ducháček, K. Jindřich |
| | REGULATORY IMPLICATIONS OF THE TEPCO DAI-ICHI ACCIDENT | |
| 12. | I. Lux | M. Ratajová, Z. Típek, V. Starostová |

APPENDIX V – RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|---|--|---|
| 1. RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT | R1 | The Government should establish a national policy and strategy for safety to ensure that the Safety Fundamentals are explicitly adopted in a high level document. |
| | GP1 | SÚJB reports directly to the Cabinet and is able to draft new legislation for Government consideration and the ability to establish regulations with legal effect, which gives it a high degree of independence. |
| | GP2 | Creation of a comprehensive State strategy to deal with unregulated radiation risks. |
| | S1 | The Government should consider establishing a national strategy for gaining or regaining control over orphan sources. |
| | S2 | The Government should consider adopting a process for periodic review of the document “Concept of Radioactive Waste and Spent Nuclear Fuel Management”. |
| 2. GLOBAL NUCLEAR SAFETY REGIME | R2 | In drafting amendments to the national regulatory framework, SÚJB should fully take into account IAEA Safety Standards and requirements. |
| | S3 | SÚJB should consider the development and implementation of a process for systematic review and evaluation of international events and the dissemination of relevant information, lessons learned and feedback on the measures undertaken. |
| 3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY | R3 | SÚJB should define a long term strategy for human resource development including corporate knowledge management as needed to ensure the accomplishment of key regulatory functions in the future. |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|--|---|---|
| | S4 | SÚJB should consider formally define core technical competences in all areas of its activities and ensure that these are represented in the available staff in order to properly discharge its regulatory responsibilities. |
| | S5 | SÚJB should consider introducing a process for feedback from the trainees as a mandatory step for improvement of the systematic approach to training process and quality assurance principles to training. |
| | R4 | It is recommended that a specific procedure is developed, identifying the rules to manage the selection process of TSOs and the monitoring of their work, to ensure that potential conflicts of interest do not compromise the reliability of the received advice. |
| 4. MANAGEMENT SYSTEM OF THE REGULATORY BODY | R5 | <p>SÚJB should further develop and implement its Integrated Management System for satisfying fully the requirements set out in IAEA safety standards and guides with regard to:</p> <ul style="list-style-type: none"> a) process implementation; b) promotion of safety culture; c) measurement, assessment and improvement; d) management of organizational changes; e) application of graded approach |
| 5. AUTHORIZATION | S6 | SÚJB should consider developing provisions for the effective coordination with other relevant authorities having responsibilities within the authorization process of nuclear installations. |
| | R6 | SÚJB should review and revise the decree covering the design requirements for NPPs to ensure that the design requirements take into consideration the IAEA safety standard SSR-2/1 “Safety of Nuclear Power Plant Design”. |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|---------------------------------|---|--|
| | S7 | SÚJB should consider developing further the internal guidance on authorization of nuclear installations to cover all stages specified in the Atomic Act well in advance of these stages. |
| | GP3 | SÚJB has created a systematic matrix tool to identify resources needed for siting assessment of Temelín 3 and 4. This matrix includes qualifications, competencies and number of people. In addition to human resources, it addresses also different tools needed for siting assessment. |
| | S8 | SÚJB should consider the arrangements necessary, in isolation or in parallel with the government, for the development of independent research and assessments for the disposal of spent nuclear fuel. |
| | GP4 | SÚJB has made an arrangement through which the financial status of all licensees of radiation sources is regularly checked from the National Registry of Insolvencies. |
| 6. REVIEW AND ASSESSMENT | S9 | SÚJB should consider documenting systematically the reasons that lead to rejecting or endorsing a recommendation of technical support organisations. |
| | S10 | SÚJB should consider developing further their use of expert advice to include technical support organisation from the international community. |
| | S11 | SÚJB should consider regularly, independently and comprehensively assessing the probabilistic safety analyses for nuclear power plants. |
| | S12 | SÚJB should consider increasing the coverage of safety relevant issues by regulatory guides complementary to regulations to provide quantitative criteria to allow for the assessment of all items important for nuclear safety. |
| | R7 | SÚJB should develop binding regulation requiring the licensee to perform a periodic safety review of nuclear installations. |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|-----------------------|---|--|
| | GP5 | SÚJB tracks the on-going assessment of CEZ's initial preliminary safety report for Temelín 3/4 with a very detailed and systematic database tool, and justifies properly the assessment of every single statement of the report. |
| | S13 | SÚJB should consider preparing regulatory criteria for the safety of research reactors in extended shutdown. |
| 7. INSPECTION | S14 | SÚJB should consider verifying that the inspection programme and related inspector training for nuclear facilities address the applicable inspection areas and aspects for each stage of the authorization process delineated in GS-G 1.3. |
| | GP6 | The representation of SÚJB management in the SÚJB Committee for the Evaluation of Inspections provides an effective methodology for the assessment of licensee performance and overall regulatory programme feedback. |
| | GP7 | Nuclear power plant operator safety culture is inspected, evaluated, documented and reported to utilities in systematic and comprehensive manner. |
| | S15 | SÚJB should consider more comprehensive and frequent training for regional inspectors undertaking inspections of the transport of radioactive material. |
| 8. ENFORCEMENT | R8 | SÚJB should finalize efforts to revise the Atomic Act to provide a detailed scale of penalties for nonconformities commensurate with their severity. |
| | R9 | SÚJB should establish and implement a comprehensive enforcement policy that takes into account all regulated activities, existing legal requirements and internal documents. |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|--|---|---|
| 9. REGULATIONS AND GUIDES | R10 | The Government should ensure a top-down approach is used for issuing regulatory requirements and guides. This may be achieved by ensuring the revised Act will contain all the necessary provisions for allowing SÚJB to develop regulatory requirements for all areas of nuclear and radiation safety for nuclear facilities. |
| | R11 | SÚJB should have a formalized procedure to undertake a gap analysis between new IAEA requirements and the Czech legislative framework in order to draft revisions to the legislative framework to keep legislation up to date. SÚJB should develop a process for reviewing and updating regulations and guides systematically. Especially new developed IAEA requirements should systematically be checked and if appropriate adopted into the Czech legislative framework. |
| | R12 | SÚJB should require comprehensive and systematic consideration of human factors at the early stage of the design process of the nuclear facilities and when modifying relevant SSCs. |
| | R13 | SÚJB should include in its licensing scheme a method for restricted or unrestricted release of the land, buildings and structures from further regulatory control. Regulatory criteria and procedures for restricted or unrestricted release of the land, buildings and structures from further regulatory control should also be provided. |
| 10. EMERGENCY PREPAREDNESS AND RESPONSE | GP8 | The nuclear and radiological emergencies are very well integrated on the national structure to face all other emergencies (e.g. conventional emergencies) where SÚJB would play a key role if a radiation emergency occurs. |
| | R14 | The Government should ensure that threat categorization, national emergency plan and recovery actions in the Czech legislation will be in line with GS-R-2 requirements. |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|----------------------------|---|--|
| | R15 | SÚJB should establish requirements for emergency action levels in the Czech regulatory framework. |
| | S16 | SÚJB should consider having an inspector present on site in the Emergency Control Centre in emergency situations, in order to provide independent oversight and to communicate with the SÚJB Crisis Staff. |
| | GP9 | SÚJB promotes and is part of a very detailed bilateral cooperation with Austrian competent authority including provision of real time data (source term, on site weather data and measurement data) as input to Austrian's decision support system. This cooperation is periodically tested in yearly exercises. |
| | S17 | SÚJB should consider improving its arrangements to provide information to the public and to the media during a radiation emergency, by establishing a comprehensive strategy in this regard. |
| 11.ADDITIONAL AREAS | S18 | The Government should consider reviewing its national strategy regarding the official recognition of referral guidelines in order to facilitate their systematic review, update and dissemination. |
| | GP10 | SÚJB and SÚRO have performed thorough analysis of the accidents and incidents in radiotherapy, the results of which have been communicated and used for optimisation and training purposes. |
| | R16 | The Government should ensure that the conditions of service of workers shall be independent of whether they are or could be subject to occupational exposure and that there can be no substitute for measures for protection and safety. |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|------|---|---|
| | R17 | SÚJB should add the requirements related to remediation activity to the national legislation taking into account relevant statements established in WS-R-3 “Remediation of Areas Contaminated by Past Activities and Accident”. |
| | GP11 | <p>The database radiation monitoring system MonRaS enables:</p> <ul style="list-style-type: none"> • Collection of data from all components of the NRMN including foodstuff contamination, dose rate monitoring made by mobile groups and environmental samples, • Automatic sending of information and warning messages to an expert on duty and to other relevant personnel from regional and national organizations that may be involved during a radiation emergency, • Using the data for preparing recommendation on making decision about countermeasures in an extraordinary radiation event. |
| | R18 | <p>The regulatory body should revise the current legal and regulatory framework to bring it in line with the requirements of GSR Part 3, including the following issues:</p> <ol style="list-style-type: none"> a. complete the process for the determination of national DRLs for the remaining diagnostic procedures (interventional radiology, interventional cardiology, paediatric CT); b. require registrants and licensees that signs in appropriate languages are placed to request female patients undergoing a radiological procedure to notify, in case of pregnancy or breast feeding (for nuclear medicine); c. revise the equivalent dose limit for the lens of the eye; |

| AREA | R: Recommendations S: Suggestions G: Good Practices | Recommendations, Suggestions or Good Practices |
|------|---|--|
| | | <ul style="list-style-type: none"> d. specify that the equivalent dose limit to the skin is to be applied to the most highly irradiated area of the skin; e. review the precise formulation for the dose limits applicable to apprentices and students younger than 18 years of age; f. implement the concepts of existing and planned exposure situations and require that doses of workers during remedial actions in existing exposure situations are controlled by the requirements for occupational exposures in planned exposure situations; g. implement the concept of safety culture and require that the necessary conditions to promote a safety culture are provided. h. require explicitly that registrants and licensees shall provide, as appropriate, suitable storage for personal clothing at entrances to controlled areas where there is a risk for radioactive contamination; i. update the exemption levels for bulk amount of materials and clearance levels; j. update the existing regulations on consumer products. |

**APPENDIX VI – CONCLUSIONS ON THE REGULATORY IMPLICATIONS OF THE TEPCO
FUKUSHIMA DAI-ICHI ACCIDENT**

| AREA | NO. | CONCLUSION |
|--|------------|--|
| TECHNICAL AND OTHER ISSUES CONSIDERED IN THE LIGHT OF THE ACCIDENT | C 1 | The IRRS Team considers that SÚJB took appropriate actions in order to cope with the implications of the TEPCO Fukushima Dai-ichi accident. SÚJB was effective and efficient in public communication as well as in the management of the Stress Test process. |
| PLANS FOR UPCOMING ACTIONS TO FURTHER ADDRESS THE REGULATORY IMPLICATIONS OF THE ACCIDENT | C 2 | The IRRS Team concludes that the possible implications of the TEPCO Fukushima Dai-ichi accident on nuclear and radiation safety in the Czech Republic were thoroughly assessed and the actions that may further enhance the nuclear and radiation safety in the country in general and the safety of the operating nuclear power plants in specific were determined and scheduled for realization in an Action Plan. SÚJB is in the position to thoroughly supervise, and, if necessary, enforce the action in the Action Plan. No short or medium term change in the nuclear and radiation safety regulatory practice was deemed necessary as a consequence of the lessons learned from the accident. |
| RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT | C 3 | The IRRS Team considers that with respect to the governmental responsibilities and legal framework implications of the TEPCO Fukushima Dai-ichi accident no concern is raised. |
| GLOBAL NUCLEAR SAFETY REGIME | C 4 | The IRRS Team considers that the Czech Republic in general and SÚJB in specific are active participants of the international co-operation in nuclear safety and the TEPCO Fukushima Dai-ichi accident raised no concern whatsoever in this respect. |

| AREA | NO. | CONCLUSION |
|--|------------|--|
| RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY | C 5 | The IRRS Team considers that SÚJB has committed to act in requiring and enforcing the safety enhancement measures decided in the light of the TEPCO Fukushima Dai-ichi accident. In most issues the existing status is appropriate, in a few issues further actions have been planned and are being implemented. |
| MANAGEMENT SYSTEM | C 6 | The IRRS team concludes that SÚJB has reviewed its management system in the light of the TEPCO Fukushima Dai-ichi accident and a set of actions for improvement of the management system has been identified and are planned for implementation. |
| AUTHORIZATION | C 7 | The IRRS Team considers that SÚJB has an adequate authorization process in place both to enforce necessary safety improvements as well as to authorize their implementation. SÚJB and the Czech NPP operator have participated in the EU level Stress Test exercise and safety enhancement needs have been identified and partly implemented at the NPPs. Further actions are needed and are suggested to enhance safety as well as to develop the legislative framework for e.g. conducting periodic safety review of the NPPs in Czech Republic. |
| REVIEW AND ASSESSMENT | C 8 | The IRRS Team considers that SÚJB and the utility have conducted a Stress Tests exercise to assess the safety of Czech NPPs against extreme external events, loss of safety functions and severe accidents. Further actions are needed and suggested to ensure the adequacy of legislative basis and enhancement of safety by setting in force the new Atomic Act and the decrees. |
| INSPECTION | C 9 | SÚJB has conducted inspections to verify the implementation of measures taken to date by the operator in response to the TEPCO Fukushima Dai-ichi accident. The IRRS Team concludes that the formal inspection programme could be reviewed for enhancement and for the incorporation of relevant inspections and programme directives that have been issued to verify the modifications to systems and procedures by the operator. |

| AREA | NO. | CONCLUSION |
|--|-------------|--|
| | | The IRRS team considered that SÚJB is committed to act as necessary. |
| ENFORCEMENT | C 10 | The IRRS team concluded that SÚJB has demonstrated its ability to impose corrective actions related to the TEPCO Fukushima Dai-ichi accident and that the regulatory body is committed to act as necessary. |
| REGULATIONS AND GUIDES | C 11 | The IRRS Team noted that the regulatory body participated in a “stress test”-type exercise. The necessary further actions have been initiated. The regulatory body is committed to act as necessary to renew the regulations and guidelines. |
| EMERGENCY PREPAREDNESS AND RESPONSE | C 12 | The IRRS Team considers that SÚJB has recognised and partly taken necessary actions in response to the TEPCO Fukushima Dai-ichi accident. Appropriate actions have been taken by means of establishing a National Action Plan. SÚJB has already finalised some improvement measures in the field of EPR, and has recognised that the NPP threat assessment should include long lasting and/or multiple releases. SÚJB is also aware that the protective measures strategy needs to be reviewed and eventually adapted to such scenarios. |

APPENDIX VII – SÚJB REFERENCE MATERIAL USED FOR THE REVIEW

| | |
|-----------------------|---|
| [1] | IRRS Questions and Answers: |
| | <ul style="list-style-type: none"> - <i>Module 1: Responsibilities and Functions of the Government</i> - <i>Module 2: Global Nuclear Safety Regime</i> - <i>Module 3: Responsibilities and Functions of the Regulatory Body</i> - <i>Module 4: Management System of the Regulatory Body</i> - <i>Module 5: Authorization</i> - <i>Module 6: Review and Assessment</i> - <i>Module 7: Inspection</i> - <i>Module 8: Enforcement</i> - <i>Module 9: Regulations and Guides</i> - <i>Module 10: Emergency Preparedness and Response</i> - <i>Module 11: Control of Medical Exposures, Occupational Radiation Protection, Control of Discharges and Materials for Clearance; Environmental Monitoring for Public Radiation Protection.</i> - <i>Module 12: Regulatory Implications of the TEPCO Fukushima Dai-Ichi Accident</i> |
| [2] | Relevant Documentation |
| SÚJB Documents | |
| | <ol style="list-style-type: none"> 1. <i>-Atomic Energy ACT No. 18/1997 on Peaceful Utilisation of Nuclear Energy and Ionising Radiation (the Atomic Act)</i> 2. <i>LAW on Fire Protection No. 133/1985</i> 3. <i>LAW on the integrated rescue system and on the amendment of some laws, June 28th, 2000</i> 4. <i>CRISIS MANAGEMENT ACT N. 240/2000 Coll</i> 5. <i>DECREE on Quality Assurance System in Performing and Ensuring Activities Related to the Utilisation of Nuclear Energy and Radiation Activities, and on Quality Assurance of Selected Equipment with Regard to their Ranking into Safety Classes, April 4, 2008</i> 6. <i>DECREE of the State Office for Nuclear Safety of 18 June 1997</i> 7. <i>REGULATION No. 307/2002 Coll. of the State Office for Nuclear Safety on Radiation Protection</i> 8. <i>DECREE of the State Office for Nuclear Safety of 13 June 2002</i> 9. <i>DECREE of the State Office for Nuclear Safety On function and organisation of the National Radiation Monitoring Network, 13 June 2002</i> 10. <i>DECREE of the State Office for Nuclear Safety On personal radiation passports, September 18, 2002</i> 11. <i>GOVERNMENT ORDER of 9 December 1998 on emergency planning zone</i> 12. <i>PROCEDURE FOR RADIOACTIVE MATERIAL SEIZURE</i> 13. <i>REPORT ON SÚJB RESULTS ACHIEVED IN THE SUPERVISION OF NUCLEAR SAFETY OF NUCLEAR INSTALLATIONS AND RADIATION PROTECTION FOR 2012</i> 14. <i>MANAGEMENT SYSTEM MANUAL of SÚJB</i> 15. <i>Draft DECREE on the provision of technical safety for selected equipment</i> 16. <i>Management System Policy of the State Office for Nuclear Safety</i> 17. <i>Draft of the NEW Atomic Act</i> 18. <i>REGULATION of 9 December 2003 amending the Regulation No. 318/2002 Coll., on details for emergency preparedness assurance at nuclear installations and workplaces with ionising radiation sources and on requirements for the content of on-site emergency plans and of emergency rules</i> 19. <i>REGULATION of 23 January 2006 amending the Regulation of the State Office for Nuclear Safety No. 319/2002 Coll., on function and organisation of the National Radiation Monitoring Network</i> 20. <i>REGULATION of 1 March 2011 on activities of health professionals and other professionals</i> 21. <i>REGULATION of 15 March 2012 on requirements for minimum technical and material equipment of health facilities and contact workplaces for home care</i> |

22. *Regulation No. 98/2012 Coll., on Medical Records*
23. *REGULATION of 22 March 2012 on requirements for minimum human resources required to provide health services*
24. *ACT of 14 June 2012 on Inspection Activities (Inspection Rules)*
25. *ACT of 6 November 2011 on Health Services and Conditions of their Provision (Act on Health Services)*
26. *ACT of 6 November 2011 on Specific Health Services*
27. *REGULATION of 16 November 2012 amending the Regulation of the State Office for Nuclear Safety No. 307/2002 Coll., on radiation protection, as amended by Regulation No. 499/2005 Coll.*
28. *REGULATION of 21 November 2012 establishing rules and procedures applicable to medical exposure*
29. *REGULATION of 6 December 2005 amending the Regulation of the State Office for Nuclear Safety No. 307/2002 Coll., on radiation protection*
30. *Act No. 505/1991 Coll., on Metrology, as amended*
31. *GOVERNMENT DECREE of 9 December 1998 on emergency zone planning*
32. *The Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic*
33. *Safety Policy of the State Office for Nuclear Safety*
34. *STATE ENERGY POLICY OF THE CZECH REPUBLIC (approved by Government Decision No. 211 of March 10, 2004)*
35. *Ethical Code for Employees of the State Office for Nuclear Safety*
36. *REGULATION 144/1997 of the State Office for Nuclear Safety on Physical Protection of Nuclear Material and Nuclear Facilities and their Classification*
37. *Regulation No. 146/1997 Sb. of the State Office for Nuclear Safety Specifying Activities Directly Affecting Nuclear Safety and Activities Especially Important from Radiation Protection Viewpoint, Requirements on Qualification and Professional Training, on Method to be used for Verification of Special Professional Competency and for Issue Authorisations to Selected Personnel and the Form of Documentation to be Approved for the Licensing of Expert Training of Selected Personnel*
38. *REGULATION No. 215/1997 Sb. of the State Office for Nuclear Safety on Criteria for Siting Nuclear Facilities and Very Significant Ionising Radiation Sources*
39. *R E G U L A T I O N No. 106/1998 Sb. of the State Office for Nuclear Safety on Nuclear Safety and Radiation Protection Assurance during Commissioning and Operation of Nuclear Facilities*
40. *DECREE of the State Office for Nuclear Safety of 13 June 2002, On type-approval of packaging for shipment, storage and disposal of nuclear materials and radioactive substances, on type-approval of ionizing radiation sources and shipment of nuclear materials and specified radioactive substances (on type-approval and shipment)*
41. *DECREE of the State Office for Nuclear Safety of June 3, 2003 On decommissioning of nuclear installation or category III or IV workplace*
42. *The Government Ordinance 416/2002 Coll. of the 28th August 2002, 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*

Policy Issue 1:

SÚJB Management Scheme

Policy Issue 2:

Transparency

APPENDIX VIII – IAEA REFERENCE MATERIAL USED FOR THE REVIEW

1. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Governmental, Legal and Regulatory Framework for Safety, General Safety Requirements Part 1, No. GSR Part 1, IAEA, Vienna (2010).
2. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Management System for Facilities and Activities. Safety Requirement Series No. GS-R-3, IAEA, Vienna (2006).
3. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Preparedness and Response for Nuclear and Radiological Emergencies, Safety Requirement Series No. GS-R-2, IAEA, Vienna (2002).
4. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3, No. GSR Part 3 (Interim Edition), IAEA, Vienna (2011).
5. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety assessment for facilities and activities, General Safety Requirements Part 4, No. GSR Part 4, IAEA, Vienna (2009)
6. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Predisposal Management of Radioactive Waste, General Safety Requirement Part 5, No. GSR Part 5, IAEA, Vienna (2009).
7. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Decommissioning of Facilities Using Radioactive Material Safety, , Safety Requirement Series No. WS-R-5, IAEA, Vienna (2006).
8. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Nuclear Power Plants: Design, Specific Safety Requirements No. SSR-2/1, IAEA, Vienna (2012).
9. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Nuclear Power Plants: Commissioning and Operation, Specific Safety Requirements Series No. SSR-2/2, IAEA, Vienna (2011).
10. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Site Evaluation for Nuclear Installations, Safety Requirement Series No. NS-R-3, IAEA, Vienna (2003).
11. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Nuclear Fuel Cycle Facilities, Safety Requirement Series No. NS-R-5, IAEA, Vienna (2008)
12. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Disposal of Radioactive Waste, Specific Safety Requirements No. SSR-5, IAEA, Vienna (2011)
13. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Organization and Staffing of the Regulatory Body for Nuclear Facilities, Safety Guide Series No. GS-G-1.1, IAEA, Vienna (2002).
14. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Review and Assessment of Nuclear Facilities by the Regulatory Body, Safety Guide Series No. GS-G-1.2, IAEA, Vienna (2002).
15. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body, Safety Guide Series No. GS-G-1.3, IAEA, Vienna (2002).
16. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Documentation Used in Regulating Nuclear Facilities, Safety Guide Series No. GS-G-1.4, IAEA, Vienna (2002).
17. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Arrangements for Preparedness for a Nuclear or Radiological Emergency, Safety Guide Series No. GS-G-2.1, IAEA, Vienna (2007)

18. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Criteria for use in Preparedness and Response for a Nuclear or Radiological Emergency, General Safety Guide Series No. GSG-2, IAEA, Vienna (2011)
19. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Commissioning for Nuclear Power Plants, Safety Guide Series No. NS-G-2.9, IAEA, Vienna (2003)
20. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Periodic Safety Review of Nuclear Power Plants, Safety Guide Series No. NS-G-2.10, IAEA, Vienna (2003)
21. **INTERNATIONAL ATOMIC ENERGY AGENCY** - A System for the Feedback of Experience from Events in Nuclear Installations, Safety Guide Series No. NS-G-2.11, IAEA, Vienna (2006)
22. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Occupational Radiation Protection, Safety Guide Series No. RS-G-1.1, IAEA, Vienna (1999)
23. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Assessment of Occupational Exposure Due to Intakes of Radionuclides, Safety Guide Series No. RS-G-1.2, IAEA, Vienna (1999)
24. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Assessment of Occupational Exposure Due to External Sources of Radiation, Safety Guide Series No. RS-G-1.3, IAEA, Vienna (1999)
25. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Environmental and Source Monitoring for Purposes of Radiation Protection, Safety Guide Series No. RS-G-1.8, IAEA, Vienna (2005)
26. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Deterministic Safety Analysis for Nuclear Power Plants, Specific Safety Guides Series No. SSG-2, IAEA, Vienna (2010)
27. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide Series No. SSG-3, IAEA, Vienna (2010)
28. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide Series No. SSG-4, IAEA, Vienna (2010)
29. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Licensing Process for Nuclear Installations, Specific Safety Guide Series No. SSG-12, IAEA, Vienna (2010)
30. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Classification of Radioactive Waste, General Safety Guide No. GSG-1, IAEA, Vienna (2009)
31. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Decommissioning of Nuclear Power Plants and Research Reactors, Safety Guide Series No. WS-G-2.1, IAEA, Vienna (1999)
32. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Regulatory Control of Radioactive Discharges to the Environment, Safety Guide Series No. WS-G-2.3, IAEA, Vienna (2000)
33. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Decommissioning of Nuclear Fuel Cycle Facilities, Safety Guide Series No. WS-G-2.4, IAEA, Vienna (2001)
34. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Predisposal Management of Low and Intermediate Level Radioactive Waste, Safety Guide Series No. WS-G-2.5, IAEA, Vienna (2003)

35. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Predisposal Management of High Level Radioactive Waste, Safety Guide Series No.WS-G-2.6, IAEA, Vienna (2003)
36. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety Assessment for the Decommissioning of Facilities Using Radioactive Material, Safety Guide Series No.WS-G-5.2, IAEA, Vienna (2009)
37. **INTERNATIONAL ATOMIC ENERGY AGENCY** - Storage of Radioactive Waste, Safety Guide Series No. WS-G-6.1, IAEA, Vienna (2006)

APPENDIX IX – ORGANIZATIONAL CHART

