

Convention on Nuclear Safety
 Questions Posted To Czech Republic in 2014

Q.No	Article	Ref. in National Report
1	General	General
Question/ Comment	Did you already accomplish analysis of possible threats to your NPPs from extreme natural events taking into account the possible effects of climate change? Are they set as a requirement for the facilities?	
Answer	<p>Yes we did, and yes they are. We have performed comprehensive analyses of extreme natural events (among other external initiators). Accordingly to the Final Safety Analysis Report (FSAR), all safety important structures, systems and components (SSCs) must meet requirements for extreme natural hazards resistance (those events having an average occurrence time ranging from once per 100 to 10,000 years). In line with the corresponding IAEA Guideline SSG-18, a meteorological events analysis was conducted; for the seismic hazard analysis the recommended PGA 0.1g value was used in line with the IAEA recommendation for low seismic hazard regions. Based upon the IAEA SSG-18 guideline, the long term period (50 years) of extreme weather data records from the Dukovany plant vicinity were gathered, and data sets were analysed and used. The most applicable reference meteorological station for representative data sets was selected. Required extreme values were then determined for hazards having an average occurrence time ranging from 100 to 10,000 years (1E-2/year to 1E-4/year) using the IAEA recommended Gumbel probability distribution. Subsequently, in line with plant Main designer guidelines, the corresponding SSC loads related to these extreme weather conditions were derived. Such an approach should be conservative enough even for climate changes under consideration.</p> <p>As a result, we have identified several cases where appropriate design improvement actions are to be taken; see ANNEX 9 - National Action Plan on Strengthening Nuclear Safety of Nuclear Facilities in the Czech Republic.</p>	

In addition to the reassessment of extreme events (such as wind, temperature, and snow) with respect to climate changes - the issue of drought and providing water for planned new blocks of NPP Temelín was also considered. For the Temelín site, studies and climate change models of long-term trends in temperature, precipitation, runoff and humidity in the period up to 2100 have been processed.

Q.No	Article	Ref. in National Report
2	General	General
Question/ Comment	<p>To which extent does the Regulatory Body currently publish safety relevant licenses, decisions, assessments, etc.? Are there intentions to modify current practice?</p> <p>Is the general public currently involved in the decision making of the Regulatory Body relevant to nuclear safety? Are there intentions to modify current practice?</p>	
Answer	<p>SUJB reports, describes, and comments on all of its important licenses/approvals (e.g. siting, construction, operation, renewal of operation license after 10 years of operation, large modifications and changes, etc.) in its Annual Reports submitted to the government and made public (internet). All licenses/approvals issued by SUJB are made available to the public upon request.</p> <p>Under the Construction Act, the general public is involved in the licensing process related to the siting, construction, operation, and major changes and modifications – these also include all aspects of nuclear safety. The general public is not directly involved in the approval processes and partial approval processes carried out under the Atomic Act. However, all approvals issued by SÚJB under the Atomic Act are made available upon request.</p>	

Q.No	Article	Ref. in National Report
3	General	General
Question/ Comment	Is there any obligation for the licence holders to inform/consult the general public or stakeholders in the vicinity of a nuclear installations on issues related to nuclear safety?	

Answer Access to information is generally regulated by Act No. 106/1999 Coll., on free access to information, as amended. The licensee - ĚEZ, a. s. - is obliged entities that have, in compliance with this law, an obligation to provide information related to their activities.

According to Section 17, paragraph 1, letter k) of the Atomic Act: "The Licensee according to Section 9 is obliged to, in addition to other duties prescribes by law, ...to provide information about nuclear safety and radiation protection, which are not state-owned secret, company secret or trade secret, to the public..." This obligation is fulfilled by the Licensee in a way described in detail in Chap. 5.1.3 "Communication with the general public" in the Czech National Report.

Q.No	Article	Ref. in National Report
4	General	General

Question/ Comment Is the safety significance of deviations from applicable current safety standards and internationally recognised good practice compiled for each nuclear installation? If so, in which intervals and are these compilations accessible to the general public?

Answer The safety significance of deviations from applicable current safety standards and internationally recognised good practice are compiled for each nuclear installation; these compilations are also in accordance with international documents - WENRA Reference Levels (2008), "Issue P". These compilations are accessible to the general public at an interval of 1 year.

Q.No	Article	Ref. in National Report
5	General	General

Question/ Comment Does the Czech Republic have agreements with neighbouring states regarding notification and possible mutual assistance in the event of a nuclear emergency?

Answer Yes. The Czech republic has bilateral agreements with neighboring states (Austria, Slovakia, Germany, Poland). Additionally the Czech Republic also has an agreement with Hungary.

Q.No	Article	Ref. in National Report
6	General	p. 12

Question/ Comment Slovakia commends the extensive and regular use of international expert missions. In this regard preliminary results of the recent IRRS mission would be welcomed during the national presentation.

Answer Yes, general conclusions given by IRRS mission will be presented during the national presentation.

Q.No	Article	Ref. in National Report
7	General	3.2.6.3.1 / p.29

Question/ Comment The enhancement of NPP safety in shutdown states and mid-loop operation was adressed in the peer review. The Czech regulator responded to this recommendation by "excluding the mid-loop modes of operation during shutdown" of the Temelin NPP (action No. 28 of the NAcP). Could you please provide information on which measures were taken to eliminate mid-loop operation at Temelin? What is the situation at Dukovany?

Answer Mid-loop operation at Temelín VVER1000 NPP has been evaluated as an operational state with very high risk with respect to shutdown safety. This conclusion has been made based on WANO SOER 2010-1 "Shutdown safety" recommendations as well as on the results of a safety margins evaluation performed during the Stress tests. To minimize the time at reduced reactor coolant inventory and increase the time margin to core uncover during plant shutdown, it has been decided to eliminate mid-loop operation from the plant outage schedule. The standard outage schedules are approved by plant management as a basis for all types of plant outages. All outage activities that require a reduced coolant inventory are scheduled on the time with all fuel removed to SFP. Practically, this means that during every refueling outage, all fuel is removed from the core.

For the Dukovany VVER440 plant, the mid-loop operation with reduced coolant inventory was never supposed to be used. The reason is that as per original design, there are main loop isolation valves on each

loop (on both the hot and cold leg), and the loop can be isolated from the reactor and RCS in the event of activities that require a reduced coolant inventory.

Q.No	Article	Ref. in National Report
8	General	3.2.1.2.2/3 / p.23
Question/ Comment	Ultimate heat sink (UHS) at Dukovany NPP are the four wet cooling towers, which are not qualified as safety components. To enhance safety, it was recommended to implement a UHS that is diverse to the existing cooling towers. As a consequence, SUJB required action No. 33 "Implementation of the ventilator towers for ensuring independent ultimate heat sink" (page 67 of NAcP). Switzerland is interested to learn how the requirement of an independent diverse UHS will be fulfilled at Dukovany NPP.	
Answer	The new independent diverse ultimate heat sink (UHS) will be fan cooling towers. Two separate cooling towers with 6 separate parts – cells. For each of the three subsystems essential service water are two cells. Each cell is supplied from a different safety train (emergency power supply 1,2,3). The current UHS system (cooling tower with natural ventilation) will be used as a back-up system. Implementation: 2014 - 2016.	
Support Documents	Scheme of UHS is attached. » CZ- answer to question posted by Switzerland	

Q.No	Article	Ref. in National Report
9	General	3.2.14.3.2 / p.36
Question/ Comment	One of the insights of the Fukushima accident is the benefit of bunkered systems, ensuring an additional level of protection even in the case of beyond design basis initiators. SUJB considered this issue in the NAcP, deriving actions No. 15 to 19 in order to implement such a protection system. Could SUJB please outline of which elements a bunkered system or a "hardened core" for Dukovany and Temelin NPP consists?	
Answer	<p>15 – Dukovany NPP – Open reactor and spent fuel pool filling during SBO – using solution in bubble condenser trays and in low pressure safety injection tanks for alternative filling. Possibility to open electro driven valve for draining trays from main and emergency control room, new seismically resistant pumps for draining tanks.</p> <p>16 – Temelin NPP – Open reactor and spent fuel pool filling with sufficient sources of additional coolant. A feedwater tank (TX), boron concentrate tank (TB10), primary coolant drainage tank (TB30), clean condensate tank (TB40) will be used as a source of coolant reservoir. Two new seismically resistant pumps per unit supplied from SBO DG will be used for draining of above mentioned tanks.</p> <p>17 – Dukovany NPP – Emergency heat removal – one 3rd Ultimate Emergency Feedwater Pump to SG per unit, seismically resistant pumps (2 pumps per 3 demineralised water tanks now)</p> <p>18 – Dukovany NPP – SBO DG – new alternative alternate current power net, 2 new, distant, sufficiently dimensioned diesel generators (AAC-DG), a functionally self-sufficient, independent (on existing systems) and resistant to the events that caused SBO</p> <p>19 – Temelin NPP – SBO DG – new alternative alternate current power net, 2 new, distant, sufficiently dimensioned diesel generators (AAC-DG), a functionally self-sufficient, independent (on existing systems) and resistant to the events that caused SBO</p>	

Q.No	Article	Ref. in National Report
10	General	Annex 9, para 3.3, page 41
Question/ Comment	It is stated that the containments in both NPPs are equipped with a post-accident hydrogen liquidation system, designed for design basis accidents. It is also stated that there is a project for the construction of the system for effective liquidation of hydrogen in case of a severe accident. Are there hydrogen explosion safety criteria accepted for Czech NPPs to serve as a basis for designing this system?	
Answer	<p>Currently, there are no specific criteria in the Czech legal framework for a hydrogen explosion. A new legal framework (Atomic Act and its implementing decrees) is being prepared. The general requirement, included in the SUJB safety guide, is to avoid dangerous concentrations of combustible gases and to keep a containment integrity also under beyond-design basis accident conditions.</p> <p>For Dukovany NPP, where the post-accident hydrogen liquidation system is under implementation, the system function is to avoid the damage of containment as a consequence of dangerous forms of hydrogen combustion (flame acceleration or detonation) in hermetic compartments.</p>	
Q.No	Article	Ref. in National Report
11	Article 6	6, p15
Question/ Comment	<p>How are common cause failures excluded in digital safety systems? Have the nuclear power plants dissimilar software for the various redundancies of the safety systems?</p> <p>What are the measures against software crime towards the software of the digital nuclear safety systems?</p>	
Answer	<p>The basic system of protections of the NPP Temelin reactor (PRPS - Primary Reactor Protection System) is divided into three independent redundant divisions; all the divisions are mutually separated both physically and electrically.</p> <p>In addition, there exists the Diverse Reactor Protection System (DRPS) which encompasses four sub-systems: diverse system of reactor scram (Diverse Reactor Trip), diverse safety systems (Diverse Engineered Safety Features), diverse monitoring system of the main control room, and diverse monitoring system of the emergency control room. The diverse protection system is designed on the basis of diversity principles in order to ensure that it is not susceptible to the same common cause failures which could affect the PRPS and PAMS (PAMS - Post Accident Monitoring System).</p> <p>Like at the Temelin NPP (ETE), the system of protections for the NPP Dukovany (EDU) reactor is divided into three independent redundant divisions, and all the divisions are mutually separated both physically and electrically. A diverse protection system is not implemented in the EDU reactor protection system.</p> <p>Resistance to common cause failures within the Reactor Trip System is ensured through the implementation of functional diversity with consistent diversification of primary and secondary protection functions into separated computer stations (i.e. in principle there are implemented two separated „Lines of Protection" (LOP) - LOP A and LOP B). Resistance to common cause failures in the Engineered Safety Feature Actuation System (ESFAS) is ensured by the implementation of some software diversity - by duplication in two LOPs of the same functions, which differ by some important software attributes (addressing) and by the implementation of manual initiation of all system ESFAS functions and their decomposition into individual actuators strictly by hardware means.</p> <p>Protection from software crimes is fully ensured by unidirectional communication, making sure that protection system software communicates exclusively in the direction out of the system, and by blocking off - both by software and hardware – access from the outside environment into the software of the protection system of the EDU and ETE.</p>	
Q.No	Article	Ref. in National Report
12	Article 6	1.2 Statement, p20
Question/	The National Report appears to consider separately "current requirements valid in the Czech Republic"	

Comment and "internationally accepted practices"? Aren't the latter included in the former?

Answer Yes, internationally accepted practices are included in the current requirements valid in the Czech Republic, the message of the sentence is to emphasise expressly both components, national legal requirements as well as internationally accepted practice.

Q.No	Article	Ref. in National Report
13	Article 6	chapter 1.1.3.1 p.16

Question/ Comment At page 16, chapter 1.1.3.1 - Overview of nuclear safety assessments performed and their main conclusions, LBB Application Review, it is mentioned that LBB methodology was successfully applied at Temelín NPP. Could you provide more details about LBB methodology applied and the positive impact on Temelin NPP design?

Answer The leak detection monitoring systems are assured by the design. The analyses for systems not meeting the LBB criteria based on US NRC SRP 3.6.2 have been completed as well.

Subsequent evaluation was conducted involving the high-energy primary circuit piping with a diameter in excess of 100 mm. To obtain such a proof, the following approach was used:

1. To demonstrate that the rupture of the concerned pipe in the defined locations will not disable a safe reactor shutdown and its maintenance in the safe-shutdown conditions. This approach is based on American document SRP.

This approach was used to evaluate piping TQ 13, TQ 23, and TQ 33, and TC 10, TC 20, TC 30, and TC 40.

A successful evaluation of the pipe rupture was performed for the following systems:

- a) high-pressure ECCS TQ 13, TQ 23, TQ 33;
- b) continuous fluid purification lines TC 10, TC 20, TC 30, TC 40.

The evaluation proved that a rupture of these lines in any location would not prevent the safe reactor shutdown and its maintenance in safe shutdown conditions.

2. To demonstrate an extremely low probability of the pipe rupture using the LBB procedure in compliance with US NRC SRP 3.6.3 and CSKAE guideline 1/1991;

A successful evaluation using the LBB method was carried out for the following piping systems:

- a) Main circulating piping
- b) Pressurizer surge line
- c) Low-pressure ECCS TQ 12, TQ 22, TQ 32.
- d) Residual heat removal system TQ 40.
- e) Passive emergency cooling system YT 11, YT 12, YT 13, YT 14

Q.No	Article	Ref. in National Report
14	Article 6	Pg. 13, Annex 3 and pg. 75-77

Question/ Comment In 2008 an IAEA mission focused on Safe Long Term Operation (SALTO) took place in Dukovany NPP and the corresponding follow up mission was invited in 2011. According to the results of the follow up mission, an issue remains open related to the strategy for the LTO, which has to be partly based on implementation of the methodology EPRI AP-913. This implies a change of the original terms of the PLIM-LTO activities. It seems that the scope and content of the LTO program design by the licensee need to be modified and extended.

Could you provided more details in this issue and the plans to resolve it?

Answer The Dukovany LTO program was (in the part of Systems, structures and components [SSCs] assessment) modified according to Effective maintenance strategy implementation (this strategy is based on principles of AP-913 methodology). The main principles of the LTO program (in the part of Systems, structures and components assessment) are currently as follows:

1. The integrated plant assessment is in process, and contains:
 - a. Scoping
 - b. Screening
 - c. Ageing management review
 - d. Review of Ageing management programs
 - e. Review of Time limited ageing analyses
2. Integrated plant assessment deals with passive, long-lived SSCs.
3. Implementation of an Effective maintenance strategy
 - a. Means implementation of Reliability centered maintenance based on principles conformed to the Maintenance rule and AP-913 methodology.
 - b. Reduces the scope for LTO assessment.
 - c. Ensures the safe LTO of active SSCs.
4. Performance of the Integrated plant assessment, and Implementation of an Effective maintenance strategy, result in the setting of complex care of particular SSCs for the period of LTO as follows:
 - a. For SSCs category 1A (main SSCs in the view of safety and operation) the component specific Ageing management program is implemented.
 - b. For SSCs category 1 and 2 (other SSCs important for safety and operation) the preventive maintenance program is implemented, ageing management activities are added according to the results of the ageing management review.

Category 3 (not important SSCs) are out of the scope of LTO.

Q.No	Article	Ref. in National Report
15	Article 6	Pg. 15, Annex IV pg. 5 and Annex 2 pg. 1
Question/ Comment	The Equipment Renovation Program for Dukovany NPP is called MORAVA. According to the report, Annex 5, in the present time the main effort is directed to conclusion of the solution of the Category III safety findings (the highest priority given for VVER440/213) and the intermediate Category II.	
Answer	<p>In the Annex 2, the item Qualification of equipment is rated as Category III and is still in the implementation phase. Could you explain what is pending and which are the plans to close it?</p> <p>Equipment qualification is based on requirements and conditions laid down to classified (selected) systems, structures, and components declared in the safety analysis, which sometimes changes during the lifetime of the plant. To satisfy the declared reliability of the systems, structures, and components, the qualification is a continuous process, which also means that the effects of equipment modifications, results of environment conditions monitoring, and results of operational events feedback evaluation on equipment qualifications are periodically evaluated. This is one of the reasons why issues related to qualifications sometimes remain open for relatively long time, generally when a large number of corrective measures must be realised. Since the beginning of the equipment qualification process at Dukovany NPP up until the present, 82 corrective measure actions have been realised to eliminate the qualification deficiencies, including seismic resistance improvements for the higher level of seismic loads. Corrective measures are realized gradually with regard to risk importance, technical possibilities, and the duration of the outage. The remaining corrective measures from the equipment qualification are:</p> <p>Unqualified HVAC of emergency power supply substations, 05/2014 (implementation planned date)</p> <p>Unqualified level measurement of essential service water pumps suction sumps, 03/2016 (implementation planned date)</p>	

Instruments of qualified I&C panel - unqualified elements in the panels and desks, 12/2016
(implementation planned date)

Unqualified servo drives at primary circuit – auxiliary systems, 04/2015 (implementation planned date)

Q.No	Article	Ref. in National Report
16	Article 7.1	Page 24, Section 2.1.2
Question/ Comment	Does The Czech Republic have plans to update existing legislation to take into account lessons learned from the Fukushima accident (i.e. SÚJB Decree No. 215/1997 Coll., on criteria for siting nuclear installations, Government Order No. 11/1999 Coll., on emergency planning zone, etc)?	
Answer	SUJB has started an intensive project to prepare a new Atomic Act and its corresponding implementing decrees. The objective of SUJB is to implement the latest knowledge and experience from regulatory practice including the lesson learned from the Fukushima accident. 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.	
Q.No	Article	Ref. in National Report
17	Article 7.1	2.1.2/25
Question/ Comment	Since we could not find the referenced Chapter 3.2.2 we would appreciate if you could provide us with some SUJB licences affecting nuclear safety. Or is it Chapter 3.1.2 which should be referenced?	
Answer	Yes, your conclusion is correct. This information is covered in Chapter 3.1.2.	
Q.No	Article	Ref. in National Report
18	Article 7.2.1	p. 25
Question/ Comment	According to the report, the Ministry of Industry and Trade is entrusted with the issuance of other resolutions (construction permit, operation licence and decommissioning permit). On the other hand the report says that the Atomic Act establishes activities for which a licence issued by the SUJB is required, such as siting, constructing and operation.	
Answer	Please clarify, by whom the various licences (construction and operation) are issued. Atomic Act sets up obligations and duties on applicants and holders of the nuclear regulatory authority - SUJB licenses/approvals; among others the Atomic Act stipulates that a site cannot be used for a nuclear facility construction and operation without a prior license/approval issued by the nuclear regulatory authority - SUJB. Similarly the Atomic Act stipulates that construction and operation of a nuclear facility cannot start without a prior license/approval by the SUJB. Additionally, Building Act stipulates that siting of a nuclear facility cannot start without a license issued by the Ministry of Regional Development (MRD) and at the same time the Building Act stipulates that MRD license cannot be issued before a relevant approval is granted by the nuclear regulatory authority – SUJB under the Atomic Act. Similarly the Building Act stipulates that construction and operation of a nuclear facility cannot start without a license issued by the Ministry of Industry and Trade (MIT) and at the same time the Act stipulates that MIT license cannot be issued before a relevant approval is granted by the nuclear regulatory authority – SUJB under the Atomic Act. So, in summary, nuclear regulatory authority (SUJB) licenses/approvals are obligatory preconditions for applicants obtaining siting, construction and operation licenses issued by the ministries.	
Q.No	Article	Ref. in National Report
19	Article 7.2.3	2.1.2 Inspections, p26
Question/ Comment	When SUJB deems relevant to impose penalties, could it be implemented without any participation of a judge or a prosecutor?	
Answer	Yes, SÚJB is authorised by the Atomic Act (Chapter six) to impose penalties without the authorisation or	

consent of any other body (judicial or administrative). However, administrative decisions may be challenged by an appeal and, if the said appeal fails, by filing an action with a court.

Q.No	Article	Ref. in National Report
20	Article 8.1	8, p32
Question/Comment	How is the staffing of the Residence State Nuclear Safety Inspectorates organized? Is a rotation of on-site (residence) inspectors from other NPP or SUJB's headquarters foreseen?	
Answer	Rotation of resident inspectors from other NPP or SUJB's headquarter is not applied. Nonetheless, there is close team cooperation and support established between inspection teams and individuals including regular exchange of experience. Organizational Chart of Residential Office – NPP Temelin is attached.	
Support Documents	» CZ- answer to question posted by Austria	

Q.No	Article	Ref. in National Report
21	Article 8.1	3.1.1, p31 - 3.1.3, p33
Question/Comment	Managing the ban of chemical and biological weapons looks significantly different than inspecting nuclear safety and radiation protection. Moreover, the level of independency is different with respect to the topic of work. Does SUJB regularly experiment any issues due to this several-aspect competence?	
Answer	There is a different approach, based on various controlled items. Nevertheless, there is some level of synergy between a nuclear safeguards inspection and inspection activities in the field of chemistry and biology. At the same time, the system of handling permission holders as well as declarations and record-keeping is similar for all these areas (CBN). From the point of view of the government, it is important that all the information relating the CBN stick together "under one roof". At present, we consider the intersection of lists of controlled items the most important asset (e.g. ricin and saxitoxin in both C and B lists) resulting in the possibility to carry out inspection of the CBN handling permission holders in the form of one mutual inspection.	

Q.No	Article	Ref. in National Report
22	Article 8.1	p. 34/257 para 3.1.4
Question/Comment	Experts and technical support to the SÚJB are primarily provided by SÚJCHBO, v. v. i. in the area of chemical and radiation safety, and by SÚRO, v. v. i. in the area of radiation protection. Is there any technical support organization in the area of nuclear safety?. If not, please explain the reason.	
Answer	SUJB, similarly to radiation protection, makes use of external technical support in nuclear safety area as well. Here, however, SUJB has contracts with several TSOs. Currently SUJB cooperates with four TSOs specialized in geology, external hazards, civil construction and transient and safety analysis. SUJB also cooperates with individual external experts and smaller expert teams on the basis of ad-hoc needs.	

Q.No	Article	Ref. in National Report
23	Article 8.1	Pg. 32
Question/Comment	How many on-site inspectors have the CSNC per site? Is it established a time limit for an inspector to be assigned to a specific site?	
Answer	SÚJB Residential office of NPP Dukovany is equipped a total of eight persons (five inspectors of nuclear safety, two inspectors of industrial safety, and a secretary). SÚJB Residential office of NPP Temelin is equipped a total of six persons (three inspectors of nuclear safety, two inspectors of industrial safety, and a secretary). There is no time limitation for assignment of inspectors.	

Q.No	Article	Ref. in National Report
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24		Article 8.1	Pg. 33
Question/ Comment	In relation to the inspection activities, could you specify the average number of inspections per plant and year, as well as the estimate resources (hours per person), in the case of a good performer plant, including those of the on-site CNSC office.		
Answer	<p>There are two plants with 6 units (2 Units in Temelin NPP, 4 Units in Dukovany NPP) in the Czech Republic. Both of them are performing comparably well.</p> <p>The average number of inspections is 32 inspections per unit and year including 12 routine monthly inspections completed by on-site inspectors. The average inspection effort is 66 hours per person and inspection. This effort includes time for preparation of the inspection, inspection, completion of the inspection report and all associated documents.</p>		
Q.No		Article	Ref. in National Report
25		Article 8.1	Pg. 33
Question/ Comment	According to the Atomic Act, SÚBJ may fine any violation of the legal obligations. Has SÚJB fined any licensee or any person during the last three years? If the answer is yes, please specify the violations.		
Answer	<p>In the field of nuclear safety, radiation protection, and emergency preparedness, all permit holders (i.e. not only those for nuclear power plants) were imposed with the following:</p> <p>in 2011, a total of 19 fines totaling CZK 5,238,000 (approx. EUR 190,000) in 2012 a total of 16 fines totaling CZK 971,000 (approximately EUR 35,000) in 2013, a total of 19 fines totaling CZK 1,031,000 (approximately EUR 37,000)</p> <p>Of the above, holder of permits to operate a nuclear power plant were imposed a fine of CZK 4,500,000 (approximately EUR 160,000) in 2011. This was with regard to the wiring at NPP Dukovany, where the holder of the permit failed to secure appropriate supervision and compliance of documentation in the field of wiring installation.</p>		
Q.No		Article	Ref. in National Report
26		Article 8.1	33
Question/ Comment	Do SÚBJ have any program to address the safety problems reported by the plant workers and to protect the whistleblower against any retaliation?		
Answer	There is no legal norm dealing with the protection of whistleblowers in the administrative legal area (i.e. also where SÚJB acts as a regulator).		
Q.No		Article	Ref. in National Report
27		Article 8.1	36
Question/ Comment	An IAEA IRRS mission was planned for November 2013. Could you summarize the results and provide information on good practices, recommendations and suggestions identified by the expert team?		
Answer	Yes, We will present and comment general conclusions given by IRRS mission during national presentation, the concrete results and lessons learned from IRRS mission will be reported on SUJB web site.		
Q.No		Article	Ref. in National Report
28		Article 8.1	p.34
Question/ Comment	<p>In the current conditions of the Czech Republic, material and human resources are sufficient for fulfilment of the basic functions imposed by the Atomic Act.</p> <p>Could you describe SUJB's implementation of its knowledge-management program?</p>		
Answer	The basic principle used in the implementation of knowledge management (training) of the staff of SÚJB is the systematic method of execution and a personalized approach to individual employees. Knowledge management is carried out in accordance to the internal directive SÚJB VDS 039 on the basis of individual plans of the personal development of employees. The compilation of the plan and its annual		

evaluation includes the participation of the employee, his immediate supervisor, and the director of the relevant department. For employees with a permanent employment relationship, training plans are processed for three years whereas for newcomers it is for a trial period of 3 months. Training may thus have the character of initial, subsequent, or ongoing education. An internal examination committee is established at SÚJB for examining the professional capacity of staff, inspectors and assistants.

Q.No 29	Article Article 8.1	Ref. in National Report 3, REGULATORY BODY
Question/ Comment	Section 3.1.2 of the report lists the licensing responsibilities of SUJB, such as siting, construction, and operation of a nuclear installation. Is there any provision for these licensing steps to be carried out in a combined or parallel fashion, or must the licenses be applied for and issued sequentially?	
Answer	Based on the Atomic Act and Building Act the licenses related to siting, construction and operation can only be applied for and issued sequentially. Currently there is no legal provision for combined or parallel licensing steps.	
Q.No 30	Article Article 8.2	Ref. in National Report 8, p34
Question/ Comment	Can you provide a list of persons who are members of your advisory groups and for whom they work mainly?	
Answer	The Advisory Board for Nuclear Safety has been suspended in view of changes to the prepared Atomic Act. The Advisory Board for Radiation Protection is still working and has the following members: Jiří Hůkla, secretary of AB, physicist, SÚRO Tomáš ěechák, physicist, Head of radiation protection department of Nuclear faculty, Czech Technical University, Prague Jan Daneš, physician, Chef of Radiodiagnostic Department of General hospital Prague Vlastimil Válek, physician, Radiological clinic, Brno Daniela Pelclová, physician, Clinic of occupational diseases Libor Judas, physicist, Chair of Czech Society for medical physicists Eva Tošovska, lawyer, Institute for Economy Irena Malátová, Chair of Radiation Protection Society Aleš Havlíček, administrator, Secretary of publishing house OIKOYMENH Vladimír Koøen, editor, Czech TV (public TV) Marie Davídková, physicist, Nuclear Physics Institute	
Q.No 31	Article Article 8.2	Ref. in National Report Page 23, Chapter 2.1.2
Question/ Comment	If 60-70% of the annual budget of the Regulatory Body comes from fees paid directly by the Licensee, how this payment does not influence the independence of the regulator?	
Answer	The independence of SÚJB is ensured primarily through its position within state administration. SÚJB is a central state administration body with clearly allocated responsibilities and powers, separated from entities responsible for e.g. the promotion of nuclear energy. Its regulatory decisions are taken without authorisation or approval of any other body. The said fees provide for, above all, compensation of the costs incurred by SÚJB (or, more precisely, by the State budget, of which SÚJB's budget is a part) when performing major regulatory tasks requiring e.g. expertise outsourcing. The collection of fees is administered by SÚJB, they are then transferred as a revenue of the State budget. Preventing and dealing with conflicts of interest are addressed in legal acts regulating the performance of state administration and inspection and SÚJB's internal regulations.	
Q.No 32	Article Article 9	Ref. in National Report 9, p39-40
Question/	How is it ensured that important backfitting measures in foreign nuclear power plants with safety	

Comment relevance for Czech NPPs will be evaluated and considered in the improvement program?

Answer On each Power Plant (Dukovany and Temelin) experiences published by the other NPP operators are monitored and evaluated. If any published measure is evaluated as relevant for Dukovany or Temelin NPP, the events committee (chaired by the plant director) assigns the implementation of this as a corrective measure. The realization of this is checked by the events committee.

Q.No	Article	Ref. in National Report
33	Article 9	4.1, p40

Question/ Comment "Another important obligation of the licensee mentioned in the Atomic Act is their liability for nuclear damage caused by operation of their nuclear installations" Assuming that any major nuclear accidents lead to tremendous consequences within the country and possibly overseas, the obligation above has a relevance limited to incidents and small-scale accidents. As an example: responsibilities shared between Tepco and the Japanese Government in Fukushima Daiichi NPP accident management.

Answer Civil liability for nuclear damage is addressed in chapter five of the Atomic Act, implementing the requirements arising from the Vienna Convention on Civil Liability for Nuclear Damage, to which the Czech Republic is a Party. It is envisaged that civil liability for nuclear damage regime in Euratom countries will be harmonised to a certain extent in the future.

Q.No	Article	Ref. in National Report
34	Article 9	39-40

Question/ Comment Are the licensees obliged to maintain a program to encourage the workers to identify and communicate any safety related deficiency and to protect the whistleblowers against retaliation?

Answer There is an established system of Near Miss – reports of “nearly events” that influence safety without the fear of subsequent persecution or punishment. Furthermore, in accordance with the safety culture, all staff can communicate their concerns about the safety with their managers without threat of any punishment or persecution.

Q.No	Article	Ref. in National Report
35	Article 10	10, p42

Question/ Comment In the 6th National Report of the Czech Republic it is stated: “A separate comprehensive assessment has been developed for each planned change according to requirements of the categorization and safety assessment of organizational changes within CEZ, a. s. The proposed changes (their safety related assessment) are submitted to the state regulatory body for appraisal before their implementation. All approved implemented changes are always subject to an exhaustive safety related analysis in the specified intervals.”

Could you please explain by examples which changes have to be approved and which not?

Answer The paragraph describes the process developed and implemented by the utility company CEZ, a.s. The basic framework of the responsibilities is defined by the Rules “Organization structure, the role and powers of particular departments“ and “The manual of integrated management“, which is approved by SUJB. All organizational changes with an impact to nuclear safety or radiation protection of power plant shall be analysed and finally approved in internal procedure by responsible persons in the management system.

The example of organizational change permitted by SUJB is any change that has an impact on control room operating personnel – number of operators in one shift (the minimum number is included in Limits and conditions for safety operation) or selected personnel for radiation protection activities. Changes resulting in an outsourcing of activity with an impact to safety or radiation protection are also subject to SUJB permit (e.g. dosimetry service).

Any organizational change with an impact to safety or radiation protection is reported to SUJB. The documentation attached to the report differs according to the categorisation.

Q.No	Article	Ref. in National Report
36	Article 10	10, p43

Question/ Comment In the 6th National Report of the Czech Republic it is stated: “The CEZ, a. s. has been making substantial efforts on a long-term basis to establish friendly and mutually beneficial relationships with the towns, municipalities and population in the vicinity of the power plants. These relationships are based on mutual confidence and honesty and the public has thus the opportunity to make sure of fulfillment of safety priority during operation of nuclear power plants in the Czech Republic”.

Does this mean that the documentation of the nuclear power plants is open to the public, and/or access is granted to the plants to assure themselves?

Answer Dukovany and Temelin NPP establish, maintain and develop good cooperation with stakeholders from the regions of the Dukovany and Temelín Nuclear Power Plants.

The Licensee organizes regular specialist excursions of local government representatives, regional authorities and state administration to foreign nuclear facilities. The mayors and representatives of local government from the neighbourhood of the nuclear power plants are acquainted in detail, thanks to this program, with the level of nuclear safety in a number of countries. They have also established contacts with their counterparts and contribute to nuclear energy safety in their cities and municipalities. The program also enables a transparent comparison of measures in the area of nuclear safety with direct public representatives.

The plant is open to the public as follows:

- Mayors and stakeholders of the emergency planning zone address the Section regularly in the newsletters which respond to all events at the power plant.
- Mayors and stakeholders in the emergency planning zone can receive daily information about the operation of the power plant by e-mail (same service as for Austrian authorities).
- Mayors and representatives of cities and municipalities in the ZHP visit the power plant during outages for refueling (including entry into the reactor hall).
- Mayors of representatives of cities and municipalities in the ZHP visit the power plant during the start and completion of major investments, currently above all measures arising with stress-tests of the nuclear power plants.
- Mayors meet regularly (twice a year) on a social basis with the Company’s top management (CEO, Production Division Director) during social events (Summer Meeting, Christmas Meeting).
- Mayors and representatives of cities and municipalities in the emergency planning zone are invited to working meetings and consultations on occasions of important developments in investments and operation (meetings with mayors to discuss stress-test findings, stress test measures, progress of the EIA process, meetings with mayors to discuss Related and Created Investment and other).
- Mayors and representatives of cities and municipalities in the emergency planning zone meet continually with the staff of the External and Internal Relations Section – the Section provides articles and reports from the life the neighborhood, the Section’s staff discusses donorship and sponsorship agreements and other with the cities and municipalities.

Company representatives inform the general public of important investment projects (construction of new units, construction of interim spent nuclear fuel storage) through public discussions in the affected cities and municipalities.

Q.No	Article	Ref. in National Report
37	Article 10	p.43

Question/ Comment We would like to congratulate Czech Republic for the established good communication with the public and local communities that, as it may be seen from the report increases further the support for the development of nuclear energy. On page 44, 3rd bullet it is written that: “Creating and strengthening relations between the power plant and its vicinity include strong economic aid to municipalities,

improvement of the conditions of life and support of various social organizations and institutions in the form of donations and advertising activities.”

Could Czech Republic share its experience in respect of the support to municipalities, i.e. what types of projects are supported and is there a legally fixed amount for this support?

Answer

Supported projects:

- construction and renewal of children’s and sports grounds
- social, health, environmental and community activities
- barrier-free modifications that enable physically disabled pupils, students and teachers of integration into the education
- the purchase of equipment and facilities that will contribute to improving the quality and attractiveness of teaching of physics
- tree planting - especially new and renewed avenues and alleys
- lighting up of pedestrian crossings

The budget has not been enacted. The annual supporting of grants varies according to the number of approved grants. Sponsorship is through the “Nadace ÈEZ” Foundation.

The Nadace ÈEZ Foundation was founded by ÈEZ, a. s. in 2002 in order to oversee donorship activities and for the purpose of strengthening the good name of the ÈEZ Group. The mission laid down by the founder in the Deed of the Foundation is fulfilled by the Nadace ÈEZ Foundation by a system of grant programs through which it provides foundation contributions to applicants. The management board solely decides about the foundation contribution based on applications submitted via the website form.

Just for example: In 2012, ÈEZ Foundation supported 388 projects with a total of 140,548,985 crowns; in 2011, ÈEZ Foundation supported 528 projects with a total of 171,692,204 crowns.

Q.No	Article	Ref. in National Report
38	Article 10	5.1.1, p41

Question/ Comment Section 4, §3 of the Act allocates the same priority to both nuclear safety and radiation protection. Convention Article 10 focuses on nuclear safety. How do you manage any potential conflicts between nuclear safety and radiation protection? For example, nuclear safety requires getting close to some components to check them, while radiation protection requires keeping far from them due to radiation level.

Answer We don’t see any conflict in this provision. If some activities are necessary to carry out to ensure nuclear safety, radiation protection shall be ensured in accordance with the ALARA principle at the same time. It is necessary to add that § 4 of Section 4 of the Act specifies the duties of the licensee as follows: "Whoever utilises nuclear energy or performs radiation activities, prepares or performs interventions to reduce emergency, lasting or natural exposure must maintain a level of nuclear safety, radiation protection, physical protection and emergency preparedness such that the risk to human life health and to the environment shall be kept as low as reasonably achievable, economic and social factors being taken into account. Implementing regulation shall establish the technical and organisational requirements and guidance levels of exposure, which are considered to be sufficient to demonstrate a reasonably achievable level or an alternative procedure to demonstrate this level." This means that protection of health and environment cannot be (on optimised level) compromised by another activity, and that this activity shall be solved by another way, fulfilling this rule.

Q.No	Article	Ref. in National Report
39	Article 10	42

Question/ Comment Does the Czech Republic have a common definition of nuclear safety culture shared by the regulatory body and plant operators? Has the Czech Republic experienced events caused by a degraded safety culture in the past? If so, please explain the events briefly with the relevance to the defined safety culture. Please

share information about measures taken by the government to rebuild safety culture and the effectiveness of the measures.

Answer The Licensee has developed a standard “Safety culture” based on INSAG-4 Safety Culture, WANO GL 2006-02 Principles for a Strong Nuclear Safety Culture and IAEA-TECDOC-1329 Safety Culture in Nuclear Installations: Guidance for Use in the Enhancement of Safety Culture. The Czech version of the IAEA-TECDOC-1329 was issued by the SÚJB, and serves as a common basis for both regulator and Licensee. Also, the new Atomic Act that is being prepared (together with relevant Decrees) will contain a special part devoted to safety culture.
At present, SÚJB is implementing a Pilot project which consists of gathering safety culture data and information (monthly review of events investigation; inspection records; PSRs) and their assessment.

Q.No	Article	Ref. in National Report
40	Article 10	43

Question/Comment It is mentioned in the National Report that the SUJB performs checks on observation of the "priority to safety" principle. How do the SUJB inspectors conduct such checks? Are inspection procedures or manuals provided to the inspectors? How are the results of checks utilized? How do the SUJB ensure that the checks be performed and analyzed in a consistent and objective manner?

Answer SÚJB inspectors check the "priority to safety" principle in the course of all inspections indirectly. SÚJB inspections are mainly focused on the fulfilment of requirements related to nuclear safety which are elaborated in the Atomic act and implementing decrees. A comprehensive set of inspection procedures exists and is used for all inspections, all aspects of nuclear safety are evaluated. Many detailed findings results from SÚJB inspections, and these finding provide a sufficient basis for the assessment of the "priority to safety" principle adherence. The use of inspection results depends on inspection findings. All findings are recorded and are used for the statistical assessment of licensee performance. If deficiencies are found, corrective measures are required to be implemented by the licensee.
Inspectors use inspection procedures for all inspections thus ensuring consistency. Feedback on inspections performance from management is frequently given to inspectors, and if needed, inspection procedures are improved.

Q.No	Article	Ref. in National Report
41	Article 10	General

Question/Comment Czech Republic may like to share measures/practices used by the regulatory body prioritizing safety in the regulatory activities.

Answer Safety is always paramount in all SÚJB activities. This principle is clearly stated in the SÚJB top level policies internal documents. The legislative pyramid also clearly reflects such principles as priority of safety, graded approach, etc. This principle is elaborated in detail in various internal documents which are derived from the national legislative pyramid. SÚJB activities are performed as described in internal documents and the priority of safety is thus ensured.

Q.No	Article	Ref. in National Report
42	Article 10	42

Question/Comment According to the report, a separate comprehensive assessment is been developed for each organizational planned change (according to requirements of the "Categorization and safety assessment of organizational changes within ÈEZ, a. s"). Could you provide a summary of the criteria and methods for assessing and evaluating the organizational changes?

Answer Organizational changes can be divided into two categories:
Uncategorized organizational change - no impact on nuclear safety
Categorized organizational change - impact on nuclear safety; these are all the organizational changes that do not meet the criteria for Uncategorized organizational change. These organizational changes are subject to a safety assessment and it is necessary to elaborate safety assessment and categorization of organizational change for them. According to their impact on nuclear safety, they are classified within

category 1, 2 or 3.

Organizational change 1 - there is a change in the performance of activities having a direct impact on nuclear safety and activities especially important from the terms of radiation protection within the meaning of the Atomic Act.

Organizational change 2 - changes in the structure, function or scope of departments, management system, content or scope of the job, cancellation of an occupied job providing the activities important to nuclear safety or cancellation of a vacant job which should provide activities important to nuclear safety.

Organizational change category 3 - changes whose implementation is proposed in the department providing or in connection with the proposed organizational change will provide activities important to nuclear safety, and these activities are not affected by organizational change.

Risks assessment (evaluation) of making organizational changes for activities important to nuclear safety, activities directly affecting nuclear safety, and activities especially important from the point of view of radiation protection:

1. Inadequate human resources to ensure the safety related activities
2. Reduction of efficiency and transparency in the management of safety relevant activities
3. Reducing the level of providing safety related activities
4. Loss of knowledge and skills relevant for providing the safety related activities

Q.No	Article	Ref. in National Report
43	Article 10	42
Question/ Comment	Do the licensees conduct periodic internal or external assessment of safety culture? Does the SÚBJ require a safety culture assessment when symptoms of licensee declining safety performance are detected?	
Answer	The Licensee conducts comprehensive external assessments of safety culture periodically; the assessment period is 3 years. Routine activities are implemented with the goal to continuously improve level of safety culture. SÚJB performs independent assessment of safety culture level as a part of periodic inspections. Results of inspections are reported to licensees monthly. SÚJB does not require any additional safety culture assessments; the Licensee has to deal with findings in SÚJB inspection reports periodically. The results of SÚJB safety culture assessments are periodically discussed with the Licensee at various levels, including the top corporate level.	

Q.No	Article	Ref. in National Report
44	Article 10	43
Question/ Comment	Does SÚBJ conduct periodic internal or external safety culture assessment of its own organization? Has CSNC carried out any safety culture assessment?	
Answer	SUJB has implemented a new safety culture assessment process that has recently been incorporated into the nuclear power plant inspection program 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. SUJB has completed formal training for their inspection staff in this area. SUJB's expectations and the evaluation methodology has also been communicated to nuclear power plant operators and the communication of the program's results has been initiated.	

Q.No	Article	Ref. in National Report
45	Article 10	44
Question/ Comment	Do the licensees and SÚBJ have available a plan for crisis communication, according to the best practices recognized internationally?	
Answer	Yes, they do. The plan for crisis communication is a part of the On-site emergency plan as set up un	

Decree No. 318/2002 Coll. SÚJB has the plan for crisis communication incorporated in its own Crisis plan.

Based on the recommendations of the International Expert's Meeting on Enhancing Transparency and Communication Effectiveness in the event of a Nuclear Emergency / IAEA 2012/ the Basic Emergency Commission decided to reassess and strengthen the concept of crisis communication with regard to the lesson learned from the accident at Fukushima NPP.

Support and management of an extraordinary event is the key task of the Emergency Commission whose member is always the spokesman responsible for initial communication with the media and activation of the Communication Section. Part of the organization is also the representative of the spokesman who administers the Emergency Information Center and manages its work.

The members of the Emergency Response Organization have at least two means of communication (company mobile phone, pager), usually accompanied with further means such as a home landline. They undertake exercises, regular psychological tests and special communication exercises. A minimum required nuclear qualification is completion of the OMEGA course.

Company mobile phones in the Emergency Response Organization system are those used for priority calls made to the state Integrated Rescue System (allowing calls during a busy network, making it possible to use several operators, etc.).

Four Emergency Commission spokesmen are connected to the Emergency Response Organization system at each power plant and four representatives of the spokesman of the Emergency Commission. The function of the spokesmen of the Emergency Commission is to act as communicators of the Communication and Marketing Section as well as further highly qualified employees of the power plant (e.g. former operators of nuclear power plants who meet the requirements and the qualification and psychological requirements and complete special communication training).

Q.No	Article	Ref. in National Report
46	Article 11.1	Page 51, Section 6.1.3
Question/ Comment	Five training groups are listed in the report (management, selected personnel, engineering departments' employees, shift and non-shift operating personnel, maintenance personnel). Are there contractors working at the plant site? If so, which categories do they belong to and how does the regulator ensure that the contractors at the site are properly trained and qualified?	
Answer	Yes. Contractors work on nuclear power plants on scheduled maintenance and facility repair, as well as on the implementation of modifications. All contractors' employees are periodically trained to independent entrance and motion within the plant, and selected professions are included in basic training – group 2 = selected personnel (radiation protection) and group 5 = maintenance staff. Verification that the contractors' staff is properly trained and qualified is subject to periodical audits in external companies as well as part of the internal operator supervision of the contractor. SÚJB periodically inspects the licensee preparation system focused on contractors' staff.	
Q.No	Article	Ref. in National Report
47	Article 11.1	Page 47, Section 6.1.2
Question/ Comment	Does the Czech Republic periodically review the monetary reserves for decommissioning to ensure that they are still adequate? If so, which government agency has the duty to carry out such a review (i.e. Radioactive Waste Repository Authority, Ministry of Industry and Trade of the Czech Republic or SÚJB)?	
Answer	SÚJB approves decommissioning plan from initial to the final phase. Initial decommissioning plan is a part documentation which has to be submitted to regulatory body with the application for licence to the operation. Initial decommissioning plan is updated every 5 years together with updated authorisation on	

creation of financial reserves for decommissioning (issued by SÚRAO based on the review of provisions to the decommissioning fund). According to Atomic Act there is no possibility to start decommissioning without SÚJB licence. The financial mechanism for annual decommissioning provisions are defined in Decree No. 360/2002 Coll., issued by the Ministry of the Industry and Trade, establishing a method to create a financial reserve for decommissioning of nuclear installations or workplaces in categories III or IV. Licensee of a workplace of III. and IV. category creates an annual contribution to the decommissioning fund calculated as a division of estimated total decommissioning cost to the number of years passed from the time when licence had been issued (according to the Article 9, para 1, letter d of Atomic Act) to the expected end of decommissioning activities. The decommissioning fund is created only in case, when estimated cost of all decommissioning activities for specific facility, verified by SÚRAO, exceeds 300 000 Kč (about 11 000 Euro).”

Q.No	Article	Ref. in National Report
48	Article 11.1	p. 86/257 para 11.1.1
Question/ Comment	<p>The NR mentions that in accordance with Section 3 of the Atomic Act, within its competence, the SÚJB approves on-site emergency plans and their modifications after discussion on the relations to off-site emergency plans; the approval of on-site emergency plan is one of the conditions for obtaining a license for the commissioning of the installation and its operation.</p> <p>Is there any special provision and EPR plan dealing with trans-boundary release from/to neighboring country. What kind of arrangements have been made to perform any coordinative exercise on emergency response ?</p>	
Answer	<p>The Czech Republic is a signatory of the Convention on Early Notification of a Nuclear Accident (the ‘Early Notification Convention’) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the ‘Assistance Convention’). With respect to these Conventions the State Office for Nuclear Safety acts as the National Competent Authority for an Emergency Abroad as well as the National Competent Authority for a Domestic Emergency (and the function of the National Warning Point) is ensured by the Operation Information Centre of the Ministry of the Interior of General Directorate of Fire Rescue Service of the Czech Republic.</p> <p>The State Office for Nuclear Safety acts as the Competent Authority with respect to the European Commission system (ECURIE). The State Office for Nuclear Safety acts as the National Competent Authority for an Emergency Abroad as well as the National Competent Authority for a Domestic Emergency towards the neighbouring countries. The Czech Republic has bilateral agreements in place with the neighbouring countries. Further, The Czech Republic as a member of the European Union incorporates the EU legislation passed on this topic into its legal framework. The Czech Republic is also a member of the Nuclear Energy Agency within the Organisation for Economic Co-operation and Development.</p>	
Q.No	Article	Ref. in National Report
49	Article 11.1	46
Question/ Comment	<p>In the hypothesis that new economical agents wanted to invest in Czech NPP, does the Atomic Act or the regulation require this agents to be authorized? Does SÚBJ have any possibility of assessing the economical and technical capacities of the new agents to maintain the safe operation of the plants?</p>	
Answer	<p>The Atomic Act and related regulations stipulate a substantive list of requirements for becoming legally, technically and otherwise qualified and permitted to carry out activities related to the utilization of nuclear energy, nuclear materials, other radioactive materials, and dual use items. The nuclear regulatory authority (SUJB) has the authority and adequate means and resources to assess and verify compliance with the Atomic Act and linked regulations, however, it is necessary to add that the Atomic Act is not the only legal instrument that must be fulfilled when carrying out activities in nuclear business, and SUJB is not the only regulatory authority assessing the economic, technical and other capabilities and qualification of potential future operators.</p>	

Q.No 50	Article Article 11.1	Ref. in National Report Pg. 49 and 54
Question/ Comment	Do the regulations and safety guides on training apply only to the licensee staff or do they include also requirements applicable to employees of external suppliers? Does SÚBJ oversight in any way the capabilities and training of employees of external suppliers?	
Answer	The regulations (Atomic Act No. 18/1997 Coll. as amended and its providing Decrees) on training apply only to the staff of NPPs. The Safety Guide SÚJB SG JB-1.3 "Training of workers to perform work activities at nuclear power plants" also includes requirements on training the contractors' staff. SÚJB periodically inspects the licensee preparation system focused on contractors' staff.	
Q.No 51	Article Article 11.1	Ref. in National Report Pg. 50
Question/ Comment	Does the training program for selected personnel (main control room operators and shift, safety engineers, etc...) include training in Severe Accident Management Guidelines? Is this item included in the examinations before the State Examining Board?	
Answer	In the framework of the Accident Management Program last year, new training programs using SAT method („systematic approach to training“) were developed for all NPP personals involved in the SAMG usage and implementation. The special ad hoc training was performed to TSC, EC emergency leader, Safety Engineers and MCR operators in the area of severe accident phenomenology and strategies used in SAMG. All personnel has been certified and, from the beginning of this year (2014), the special training program has been implemented. The State Examination Board includes a question about the transition from EOPs to SAMGs and general SAM strategy usage. It is not supposed to incorporate the specific SAM phenomena in the MCR personnel state exam, because the responsibility for SAMG usage is not on them.	
Q.No 52	Article Article 11.1	Ref. in National Report Pg. 52-53
Question/ Comment	Are the simulators equipped with appropriated software to represent severe accident sequences?	
Answer	<p>The full scope simulators are provided for control room operator training. Dukovany NPP full scope simulators are not able to simulate sequences of severe accidents. They allow simulations of normal, abnormal and accident conditions (design basis and beyond design basis covered by Emergency Operating Procedures - EOPs) and also allow training of transition from EOPs into Severe Accident Management Guidelines (SAMGs). The scope of the simulation is limited by the maximum design basis accident, Station Black Out (SBO) and by reaching the core exit temperature of about 1200 °C.</p> <p>Similarly, Temelin NPP full scope simulators are not able to simulate sequences of severe accidents. They allow simulations of normal, abnormal and accident conditions (design basis and beyond design basis covered by Emergency Operating Procedures - EOPs). The scope of the simulation is limited by the maximum design basis accident and Station black out (SBO).</p> <p>Since the full-range simulator is not designed for a simulation of course of severe accidents, a special simulating tool enabling the display of courses of the pre-calculated parameters and their behavior in time and location has been developed and implemented. This simulation tool is used for training the personnel (mainly TSC) involved in in the SAM. The tool is based on an animated display of the course of a severe accident in the reactor, the primary circuit, and the containment. It is possible to change the speed of the display, repeat selected sections of the accident, and select the set of additional animated graphs of the characteristics of the accident.</p>	
Q.No 53	Article Article 11.1	Ref. in National Report Pg. 56
Question/ Comment	There is a common agreement on the influence of organizational factor in the human performance. Consequently, not only human factors but also organizational factor should be taken into account in the	

analysis of operational events.

Do the licensees apply other methodologies in addition to HPES, such as MORT (Management Oversight and Risk Tree) or others, in the analysis of some especial relevant events?

Answer To encode events causes, the licensee uses the WANO Event Coding System (WANO Operating Experience Programme – Reference Manual, 4/2013). The system analyzes the causes of human factors, management (organizational factors), and device causes. In some cases (especially in Dukovany NPP), the ASSET methodology is still used.

Q.No	Article	Ref. in National Report
54	Article 11.1	Pg. 56

Question/ Comment As a consequence of the Fukushima accident, are the licensees or SÚBJ established any research program related to human behavior under extreme conditions?

Answer As a result of the Fukushima accident, the licensee has introduced the following measures related to human behavior in extreme conditions:

- 1) Defining the psychological characteristics of Emergency Response Organization members; their differentiation to different roles with accentuation of increased mental resistance during an extraordinary event.
- 2) Creation of a specific educational program for Standby Emergency Response Organization members focusing on communication in a crisis during an extraordinary event.
- 3) Implementation of observations aimed at fulfilling professional roles of Standby Emergency Response Organization members during emergency drills with the following evaluation and feedback incorporation into the above mentioned training program.

The aim of all these activities is the psychological training of NPP staff for behavioral conduct during an extraordinary event.

Q.No	Article	Ref. in National Report
55	Article 11.2	6.1.2, p52-53 11.1.2, p99-100

Question/ Comment Training at simulators is performed for the benefit of the main control room staff. One of Fukushima Daiichi NPP accident learnings is that NNP personnel need to know how implementing backup supplies, such as mobile diesel generators and so on, in order to apply updated Severe Accident Management Guidelines. Are there any practical training sessions for implementation of backup supplies on- and off-site?

Answer Station black out (SBO) training including power recovery with the use of a full-scale simulator is conducted on both plants. The training is designed for main control room staff, electrical staff and Technical support centre staff. In addition to this standard periodic training, special type of training focused primarily on coordination and communication activities during the SBO and power recovery with the involvement other participants involved in the solution of this event, is conducted on both sites 1 x per year. This training was prepared and carried out, among plant staff net operators, employees of the transmission system and operation of hydro power plants (Lipno, Dalesice and Vranov) attended.

In the framework of measures for hardening of both plants after the events at Fukushima, additional measures to supplement other sources of supply and other technical resources for coping with events at both sites, are prepared and implemented gradually. In connection with the implementation of these measures, concerned staff training will also be implemented. The potential impact of these measures into the Severe Accident Management Guideline will be reflected in the basic and periodic training issues of accident management.

Q.No	Article	Ref. in National Report
56	Article 12	12, p55

Question/ Comment How is the implementation of lessons learned from operational experience monitored?

Answer The implementation of lessons learned from operational experience is monitored by the NPP event committee and by the Regulatory body.
The NPP event committee on both NPPs, which are chaired by the plant director, checks the implementation of corrective measures from operational events. Staff from Dukovany/Temelin feedback department monitors the repeating of the events. Status of implementation of the corrective measures is part and parcel of the record of the event committee session.

In the case of repeated event identification, the causes of recurrence are analyzed. The new system is set to evaluate the efficacy and effectiveness of corrective measures for safety-significant events after two years after the event.

Regulatory bodies make regular investigations of operational feedback processes in both NPP. Part and parcel of this investigation is to check the implementation of corrective measures as well.

Q.No	Article	Ref. in National Report
57	Article 12	7.1.2, p57

Question/ Comment Are there any specific human-factor-related requirements to perform the exam?

Answer Requirements for the evaluation of the human performance area include:
a) Evaluation of selected personnel during training on simulators
b) Evaluation of selected personnel within the state exam on the simulator to obtain resp. renewal of the Authorization (license). The state exam is performed before the state examining board. The regulator checks out members of the commission and emits the Authorization.

Examples of evaluated areas:

Communication skills, teamwork and team management, use of techniques to prevent errors (self-control, pre-job-brief (PJB), inquisitive approach, use of operating experience, co-verification, etc.)

Q.No	Article	Ref. in National Report
58	Article 12	p. 115/257 par 12.1.5

Question/ Comment It is said in the section 12.1.5 that "EZ, a. s. is preparing the construction of power plant with two units of modern type (Generation III+ reactors) at Temelín power plant site.
Could you indicate the roadmap of establishment of the two NPPs in Temelin power plant site?. For example, bidding, design, construction, commissioning, connection to grid, and operation activities.

Answer The roadmap of the project has been modified recently and the date of signature of the EPC contract with the selected bidder has been postponed till June, 2015. The current expectation of the further milestones is as follows:

Signature of the EPC (Energy Performance Contracting) contract (end of bidding phase) : 06/2015
Basic design : 2016
Site decision : 2017
License for construction of the nuclear facility : 2018
Construction permit / start of construction : 2018/2019
First concrete : 2019/2020
Start of commissioning : 2024/2025
Preliminary acceptance / start of trial run : 2026/2027

It is obvious that the above schedule will be subject to modification with respect to the conditions of the EPC contract with the selected bidder.

Q.No	Article	Ref. in National Report
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59		Article 12	56
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Question/ Comment Do the licensees have in place a program to control the consumption of alcohol and drugs while on duty? Is there any legal requirement for such control?

Answer Yes, at the licensee's binding internal documentation - program, there are established requirements for the prohibition of taking alcohol and other addictive substances (drugs) into the workplace, a ban of their consumption at the workplace, and before entering the workplace. All employees of the licensee and other individuals entering the protected area of the nuclear facility and the licensee's workplace are regularly made familiar with this documentation and requirements, and their knowledge of these is periodically checked. The compliance with these requirements is carried out by both planned and spot checks, the results are evaluated and adequate measures are taken, including the permanent withdrawal of permission for admission of individuals under the influence of alcohol and other addictive substances (drugs) to the workplace of the licensee.

Prohibition of alcohol and other addictive substances (drugs) at the workplace and before entering the workplace has been, in the Czech Republic, addressed by Act No. 379/2005 Coll. as amended by Act No. 225/2006 Coll. (Tobacco Act) and Act No. 262/2006 Coll. (Labour Code). The prohibition on taking alcohol and other addictive substances (drugs) into the protected area of the nuclear facility has been further set by SUJB Decree No. 144/1997 Coll.

Q.No		Article	Ref. in National Report
60		Article 12	para 7.1.1 page 56

Question/ Comment The following is stated in para. 7.1.1: «To minimize the human factor impact in the course of performing activities the NPP has been continuously developing a system of operating procedures to guide each operator and warn about potential risks, while providing absolutely unambiguous description of activities. Selected manipulations are described in the form of check-lists».

Please clarify the place of check-lists within the entire set of operational documents. Are check-lists used in normal operation procedures, in emergency procedures, and in BDBA management guides/SAMGs?

Answer Check-lists are included especially in the handling parts of the selected unit's procedures (the unit start-up procedure, the unit operational on nominal power procedure, the unit shutdown procedure, the operation of the unit during outage procedure, the technical specifications testing procedure, etc.) and in the selected chapters of handling part of system procedures (the main coolant pump procedure, the steam generator auxiliary feeding procedure, the normal and emergency heat removal procedure, etc.) at the both NPPs (Temelin and Dukovany).

Both plants have implemented symptom-based EOPs and SAMGs in the original two column format. The check-list was never supposed to be used in this type of procedures, but in the line with users' guide for symptom-based emergency procedures the operators should keep records going through the procedures.

Q.No		Article	Ref. in National Report
61		Article 13	Page 62, Chapter 8.1.4

Question/ Comment Do you have any means to measure the effect of the management system on safety culture? What kind of performance indicators are used to it?

Answer The SÚJB is implementing a Pilot project which consists of gathering safety culture data and information (monthly review of events investigation; inspection records; PSRs) and their assessment. Organizational changes (Management system) within the Licensee/Operator are assessed vis-a-vis recorded events, and new legislation covering safety culture issues is under development.

Q.No		Article	Ref. in National Report
62		Article 13	Page 62-63, Chapter 8.1.4.

Question/ Comment There is a seemingly or actually contradiction between the «cross-sectional character»; and the «self-assessment»; as the main tool of the internal checking system.

Could you please better clarify the methods used in the internal checking process?

Answer Internal checking system consists of the following tools/methods:

- Individual and group assessment (including self-assessment);
 - Line/process control and evaluation (checks performed by leaders, observation, coaching, evaluation processes by guarantors);
 - Independent internal evaluation (Internal audits, quality audits and EMS, nuclear monitoring, independent evaluation nuclear safety and radiation protection, supervision of contractors).
- Due to common synergy, all the above mentioned tools/methods support and encourage the continued improvement and high level of safety.

Q.No 63	Article Article 13	Ref. in National Report p. 118/257 section II
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Question/ Comment It is stated that after positive assessment of the above documentation the SÚJB will issue the operation permit, while the list of classified equipment and physical protection assurance proposal are subject to a separate approval by the SÚJB.
Does the separate document dealing with physical protection approval cover the provision and arrangement of performance exercise or drill, in order to anticipate all design basis threat scenarios, and in connection with the proposed EPR exercise ?.

Answer The physical protection assurance proposal ("proposal") must fulfil all requirements of SÚJB Decree No. 144/1997 Coll., on the physical protection of nuclear materials and nuclear installations and nuclear facilities and their classification, as amended by the SÚJB Decree No. 500/2005 Coll.

There are, among others, all administrative and technical requirement provisions which must be fulfilled by the operator to obtain approval.

Regarding the threat to the nuclear facility there exists the classified document issued by the SUJB "Design basis threat for nuclear facilities, nuclear material including transport of nuclear material in the Czech Republic (DBT)". This document mentions all possible threats including a quantification of attackers. The operator must prove in above mentioned "proposal" that he is able to face all threats mentioned in DBT.

Exercise scenarios regarding physical protection are primarily the responsibility of the operator. SÚJB regularly attends exercises and evaluates if the exercise meets all requirements.

Q.No 64	Article Article 13	Ref. in National Report Pg. 64
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Question/ Comment Does SÚJB have in place a management system according to the IAEA GS-R-3?

Answer The SUJB Integrated Management System in place is currently in the process of further development and implementation as SÚJB is changing the current management system documentation structure and updating it. A dedicated action plan is being implemented by SÚJB with the aim to align the structure of the current management system documentation to the structure recommended by GS-R-3.

Q.No 65	Article Article 14.1	Ref. in National Report 14, p65-78
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Question/ Comment Please specify the regulations, if a redundancy of a safety system is in repair during the operation of the plant?

Answer The regulations, if a redundancy of a safety system is in repair during the operation of the plant, are described in the limits and conditions, which are in accordance with SÚJB Decree No. 106/1998 Coll., Part Four: Technical and Organisational Conditions of Safe Operation of Nuclear Installation Section 14, Principles of Operation of Nuclear Installation, "(2) The operation of nuclear installation is carried out according to the operating instructions and in accordance with the limits and conditions of safe operation".

Q.No	Article	Ref. in National Report
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66	Article 14.1	Page 65, Section 9.1.1
Question/ Comment	The process for issuance of siting, construction and operating licences appears significantly different than the practice in Canada where the nuclear regulatory body (CNSC) issues all of the licences. Does The Ministry of Regional Development and the department of planning and building control of the Ministry of Industry and Trade have the necessary staff expertise to make siting decisions and issue construction permits and an operating licence on their own or do they rely on expertise from organizations like SÚJB?	
Answer	Both the Ministry for Regional Development and the Ministry of Industry and Trade rely on cooperation with relevant government authorities in the individual administrative proceedings.	

According to the Building Act – Section 4 paragraph 2:

"The town and country planning authorities and the building offices proceed in mutual cooperation with the respective authorities protecting the public priorities pursuant to special regulations 4.

The respective authorities issue:

- a) binding assessments for issuance of the decision pursuant to this Act by virtue of special regulations, which are not separate decisions within the administrative proceedings, unless the special regulations provide otherwise,
- b) for procedures pursuant to this Act which are not the administrative proceedings, assessments which are not separate decisions within the administrative proceedings, unless the special regulations provide otherwise; the assessments are binding materials for the development policy and for measures of a general nature issued pursuant to this Act."

The Ministry for Regional Development has delegated the competence of this issue to the Planning Department. Proceedings for applications for the location of buildings, including nuclear installations, are not procedurally different. The employees of this field possess the skills necessary to lead such proceedings, in that the skills are a prerequisite for the performance of the building authority.

The Ministry of Industry and Trade has established, for this purpose, the department of planning and building control for the nuclear area, which all building permits issued on the basis of opinions of different expert ministerial departments and organizations set out in the Building Act (such as the fire brigade, hygienic service and others - particularly for State Office of Nuclear Safety). The staff of this department has been strengthened in the past year.

Q.No	Article	Ref. in National Report
67	Article 14.1	77,78

Question/
Comment How much inspection effort (e.g. manmonths?) is SUJB using for routine inspections?

Answer The average inspection effort for routine inspections is 90 man-hours per month and unit.

Q.No	Article	Ref. in National Report
68	Article 14.1	77,78

Question/
Comment How many planned special inspections and "ad-hoc" inspections were carried out in one year (e.g. 2012)?

Answer There were 137 special inspections and 3 "ad-hoc" inspections carried out during the year 2012.

Q.No	Article	Ref. in National Report
69	Article 14.1	123,124

Question/
Comment It is mentioned that SUJB is presented with the "program of commissioning stage". How detailed is this program? Is SUJB approving each commissioning tests in detail or is this more like overall schedule and content of each commissioning stage?

Answer The stage program contains:

- a) the purpose, the description and the methodology of performance of works of the given stage;

- b) the reciprocal time and logic relations among the individual activities of the given stage;
- c) the requirements on the preparedness of technology and energy;
- d) the acceptance criteria and the methodology of the evaluation of their fulfilment;
- e) the description of initial and final state of stage;
- f) the organisational and personal assurance of the given stage;
- g) the method of transferring way of transient to the further stages;
- h) the list of partial programs, that for individual activities especially contain:
 1. the aim, the description and the methodology of performance of individual activity;
 2. the requirements on the preparedness of technology and energy;
 3. the acceptance criteria and the methodology of the evaluation of their fulfilment;
 4. the initial and final state for given activity;
 5. the organisational and personal assurance of activity.

See Section 9 paragraph 2 of the SUJB Decree No. 106/1998 Coll. - <http://www.sujb.cz/fileadmin/sujb/docs/legislativa/vyhlasaky>

Q.No	Article	Ref. in National Report
70	Article 14.1	ISI program, p75
Question/ Comment	Why not considering an accredited Inspection Body of "A" type?	
Answer	<p>Within its field of activity of guaranteeing the state supervision of nuclear safety and radiation protection, the SUJB also executes the supervision of technical safety of the selected equipment. An integral part of the technical safety is securing a continuous agreement of the selected items in the nuclear sector with the technical requirements, which are specified in implementing regulations of the Atomic Act or other obligatory technical specification for the selected equipment.</p> <p>In the field of manufacturing, this agreement according to the Atomic Act is safeguarded through authorized persons whose activities are supervised by the SUJB.</p> <p>In the field of operation, which is fully within terms of reference of the SUJB, the supervision is performed through the SUJB inspectors on EDU and ETE localities.</p> <p>At the same time, the SUJB uses, for support of its supervision function, the documented outputs obtained from the supervising inspection body of the type B. These outputs are primarily the documented outputs from input controls, controls in the process of manufacturing, and final controls, further also specified and partial evaluations of technical safety oversight, and others.</p> <p>From the above list of the supervision performed within the present legal framework, it follows that it is not currently necessary to secure further supervision through an accredited inspection body of the type A.</p>	
Q.No	Article	Ref. in National Report
71	Article 14.1	Sub-section 9.1.2, pages 70-72 and "Prob
Question/ Comment	Comprehensive and continuously updated PSA studies (including "living" PSA) for all power units and application of their results in routine operation could be marked as "good practice".	
Answer	We are heartily pleased with your comment. Thank you for it.	
Q.No	Article	Ref. in National Report
72	Article 14.1	Pg. 68
Question/ Comment	In addition to the EOPs and SAMGs, are there guidelines and equipment to cope with big destructions and fires, such as those that could be caused by the impact of a commercial aircraft?	
Answer	Both the EOPs and SAMGs are based on a symptomatically-oriented approach. It means that the actions implemented during an emergency situation are independent of the initial event and that the main goal of actions is to recover safe stable state of unit. EOPs and SAMGs contain the high level strategies for that, and they are supported by plant operating instructions including instructions for plant system operation fire extinguishing. Based on the Stress tests results, the existing instructions, procedures and guidelines	

will be supplemented by new “Extensive Damage Mitigation Guidelines” for large damage to plant infrastructure.

Q.No	Article	Ref. in National Report
73	Article 14.1	Pg. 68
Question/ Comment	According to the Peer Review of the stress tests report (pg. 21), a request to maintain filtered containment venting system from the SÚJB was still open at the time of the country visit. Has any decision been taken on this subject?	
Answer	<p>Implementation of a filtered containment venting system is under evaluation for both NPPs. The final decision depends on a solution of molten core stabilization. At Dukovany NPP In-Vessel Retention system and Passive Autocatalytic Recombines with capacity for hydrogen generated under severe accident are being implemented and therefore no more uncondensable gases that could challenge containment by overpressurization are generated during severe accident. Furthermore, a bubbler tower with pressure suppression system is used in VVER440 design to prevent containment overpressurization by steam during accident conditions.</p> <p>At Temelin NPP the final solution for molten core stabilization has not been selected yet. There are still two possibilities for molten core stabilization: In-Vessel Retention or Ex-Vessel Cooling. Based on the final decision for molten core stabilization the corresponding measures for containment overpressurization protection will be adopted.</p> <p>SUJB required licensee to submit analyses of potential containment overpressurization considering the adopted measure for corium stabilization. These will be submitted according to National Action Plan.</p>	

Q.No	Article	Ref. in National Report
74	Article 14.1	68
Question/ Comment	According to the Peer Review of the stress tests report (pg. 21), the possibility of re-criticality was considered by the NPPs and was excluded based on certain qualitative considerations, although no dedicated detailed analyses was performed. The Peer Review Team recommended that regulatory authority considers the need of requesting additional investigations of the potential for re-criticality for the correspondent SAM strategies. Has there been any progress in this subject since then?	
Answer	A new project for the investigation of the use of water during beyond-design accident conditions including the use of unborated (clean) water, the long-term use of borated water for heat sink by steaming, and remedial measures for treatment of large volume of contaminated water is prepared to be started this year.	

Q.No	Article	Ref. in National Report
75	Article 14.1	Pg. 69
Question/ Comment	According to the report, the modifications that have an effect upon safety and that change the preconditions used in Final Safety Analysis Report shall be approved by the SÚJB prior to their implementation. This procedure was confirmed for both power plants by a joint agreement between the SÚJB and ÈEZ, a. s. Could you detail the criteria applied to determine which modifications that shall be approved?	
Answer	<p>The SUJB permit is required for any change with direct impact to safety. From the technical point of view, this is modification of the design or design bases. Criteria are specified as follows:</p> <ul style="list-style-type: none"> • Safety function change, e.g safety valve opening pressure change • Nuclear fuel change or fuel design modification, e.g. type of fuel, technical parameters (material or design of fuel assembly parts) • Replacement of component that fulfils a safety function, e.g. change of parameters of pump leading to reduction of flow rate • Media or media´s parameter change • I&C change – algorithm, setpoints, protection systems settings, analogue to digital I&C replacement • Set of design basis accident • Operating rules that change Limits and conditions for safety operation 	

- New systems to be connected to existing safety systems, e.g. primary circuit feed water input from alternative source,
- Changes resulting in increased frequency of initial events or failures
- Changes with high possibility of barrier break
- Methodologies of safety analysis, method of computation changes
- Powerup rate

Organizational changes:

- any change that has impact on control room operating personnel – number of operators in one shift (the minimum number is included in Limits and conditions for safety operation) or radiation protection for selected personnel
- Changes resulted in outsourcing of activity with impact to safety or radiation protection are subject to SUJB permit (e.g. dosimetry service).

Q.No	Article	Ref. in National Report
76	Article 14.1	77

Question/Comment Both Dukovany and Temelin NPP have implemented a living PSA program and the licensee applies its results in a number of plant activities. Does SÚJB take into account PSA insights in its regulatory activities, such as the inspection planning or the categorization and follow up of the inspection results?

Answer The document "Risk evaluation of the systems and components" was developed. This document is an appendix of the internal document "Inspections planning, performance and evaluation at nuclear installations." This document stated the importance of both NPPs equipment from the point of view of the risk (by importance measures F-V, RDF, RIF). This list would be take into consideration during inspection planning and also at the evaluation of the inspection findings.

Q.No	Article	Ref. in National Report
77	Article 14.1	76

Question/Comment Are there in the Czech NPP any buried pipe? If the answer is yes, do you have special programs to check and control the degradation mechanisms than can affect to this kind of pipes?

Answer Yes, we have buried pipes in Czech NPP.
Some buried pipes have technical standards:
ÈEZ_ST_0026 To replace the optimization of circulating cooling water
ÈEZ_TST_0019 Raw water piping system input
These standards are under revision now. Actual needs are to cover all buried pipes by general AMP (Aging Management Program) using the last state of arts in NDT (Non Destructive Testing) diagnostic methods.

Q.No	Article	Ref. in National Report
78	Article 14.1	Pg. 76

Question/Comment Do the licensees have in place any program or precautions to prevent non-conforming, counterfeit, fraudulent or suspect components to be introduced in the plants?

Answer The licensee is first of all bound by the fulfillment of set requirements of the Atomic Act and its implementing regulations. When arranging the processes related to a product, the licensee must have prepared procedures that guarantee that all activities will proceed under predetermined conditions. This will prevent the use of non-conforming, counterfeit, fraudulent or suspect components in the nuclear plants. The documented outputs from control and oversight activities, such as the controls in the process of manufacturing, storing, input control, operational control of the items, final control, and others, are the basis for assessment of the effectiveness of the technical safety. The licensee has qualified personnel whose competence is authenticated by a prescribed method.

Specifically:

There exists a list of qualified suppliers who provide their products and services to Czech nuclear power plants. A supplier can be included into this list only on the basis of an assessment of his compliance with the set requirements using the procedure called "Initial Assessment of Suppliers for the NPP"; compliance of the suppliers with the requirements is periodically evaluated using the procedure called "Evaluation and Qualification of Suppliers" and the suppliers not complying with the requirements are removed from this list. Using these procedures, there are assessed services and products of all providers of the safety-important components to the plant (the safety-important components are those components, to which the requirements of the Decree No. 132/2008 are to be obligatorily applied). The "Quality Plan" is also a part of supplier documentation. The processes and activities encompassing designing, ordering, manufacturing, delivering, storing, and assembling of the nuclear-power-plant components are carried out according to the requirements of the internal standard "Technical Safety".

Q.No 79		Article Article 14.1	Ref. in National Report 78
Question/ Comment	Could you provide the number of "ad hoc" inspections that SÚJB performs per plant and year and the human resources (person x hours) devoted to this activity?		
Answer	The SUJB carries out about 1-2 "ad hoc" inspections per plant and year with a human effort of 20-25 hours per person. The number of inspectors involved in one inspection varies from 1 – 4 persons.		
Q.No 80		Article Article 14.1	Ref. in National Report p.73
Question/ Comment	CDF = below 1.00.10 ⁻⁸ for seismic events Is this CDF value the result of the seismic hazard being re-assessed following Fukushima? What is the current state of the assessment of hazards?		
Answer	<p>No, the CDF seismic event contribution was not re-assessed as a result of the Fukushima accident. The reason for this was that seismic hazard analyses for both sites have been conducted (or inputs to this analysis have been re-assessed) and found to have a very low contribution to the total CDF. For Dukovany NPP the contribution of seismic events to total CDF was found to be 5,98E-07/year, for Temelin NPP even lower (below 1E-08/year) due to the lower site seismic hazard (frequency of occurrence) and SSCs sufficient seismic qualification compared to Dukovany site. The Fukushima accident did not impose any special impact to the sites' seismic hazard analysis, approach and results.</p> <p>As far as the current state of the hazards assessment is concerned, we have done (beyond internal initiating events) comprehensive analyses of extreme natural events (among other external initiators). Accordingly to the Final Safety Analysis Report (FSAR) all safety important structures, systems and components (SSCs) have to meet requirements for extreme natural hazards resistance. As a result we have identified several cases where appropriate actions are to be taken, see ANNEX 9 - National Action Plan on Strengthening Nuclear Safety of Nuclear Facilities in the Czech Republic.</p>		
Q.No 81		Article Article 14.1	Ref. in National Report para 9.1.2 pages 70-73
Question/ Comment	Based on the information provided in the Report it can be understood that significant scope of work on PSA was performed for Dukovany and Temelin NPPs, whose results are used practically. Does the Operator plan to carry out activities on expansion of the PSA scope, in particular of level 3 PSA? Are there requirements of the national regulatory authority related to level 3 PSA?		
Answer	We have Level 1 and Level 2 PSA analyses for both at power and shutdown/outage modes of operation for both internal and external initiating events developed, and we are maintaining these models in a living state. There is neither a legal requirement nor a national regulatory body recommendation to perform PSA Level 3 analysis (unlike Level 1 and 2 PSAs). As such, we do not intend to perform Level 3 PSA, at least not in the near future. In addition, it is thought that the Level 3 PSA (Level 2 as well, partially at least) contains too large uncertainties compared to the Level 1, 2 analysis.		

Q.No	Article	Ref. in National Report
82	Article 14.1	para 9.1.2 page 68
Question/ Comment	How do you do regarding qualification of equipment employed in severe accident management?	
Answer	The approach to severe accident mitigation is based on the use of all currently available equipment independent of their qualification. However the project for verification of correctness of assumptions about the functioning of the equipment during beyond design conditions and external risks, including possible measures identification to ensure functionality according to SAMG, is in progress. The methodology for such evaluation has been developed and now, based on this methodology, the assumptions on the functioning of the equipment will be verified and corresponding corrective actions will be specified if necessary.	

Q.No	Article	Ref. in National Report
83	Article 14.1	para 9.1.2 page 67
Question/ Comment	It is indicated that "The Safety Monitor, version 3.5a,..., used to evaluate the time schedules of all outages for risk level optimization at least two months prior to implemented outage, and to evaluate real or intended changes in time schedule during outage...". Please clarify:	
	<ul style="list-style-type: none"> - Are there additional procedures for making decisions using "Safety Monitor"? Are these measures used in emergency response or accident mitigation? - What actions are taken to consider effect of equipment aging on the core damage frequency and how this is implemented in the "Safety Monitor"? - What are criteria for updating the living probabilistic model and safety monitoring model to take into account safety improvement measures? 	

Answer	<p>- No, there are no additional procedures for making decisions based upon Safety Monitor results or recommendations, neither for emergency response nor for accident mitigation. This would require Safety Monitor running in on-line mode of operation, which is not our case yet. There is no legal requirement to use risk monitor tools in such a manner. Safety Monitor is used for "off-line" risk optimization of maintenance and outage schedules prior/during/after each outage. The risk assessment is a part of standard outage procedure. In addition, risk profiles are developed monthly/quarterly/annually and analysed and reported to the utility as well as to the regulatory body, along with the units' most risky configurations.</p> <p>- As far as aging is concerned, we do not intend to introduce any aging modeling into the PSA models yet. The aging effects are included/reflected just in the plant-specific (un)reliability data, not in the special aging of both active and passive component failure rate models. As we do not include aging effects in the PSA, the same case is applicable for Safety Monitor, which is a tool for risk assessment of actual plant configuration(s) in a given plant operational mode/state.</p> <p>- Criteria for updating living probabilistic models are set up by both regulatory body recommendations (annually in case of implementing major design/procedures change with significant impact to the CDF/LERF, but at least in every 5 years + 10 years time interval requirement for Periodic Safety Review purposes).</p>	
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Q.No	Article	Ref. in National Report
84	Article 14.1	para 9.1.2 pages 67-68
Question/ Comment	Information on the status of emergency procedures for Czech NPPs is provided on pages 67-68. In particular, the development and implementation of Emergency Operating Procedures and Severe Accident Management Guidelines are mentioned. It is also stated that in 2012 SAMGs were completed with chapters dealing with states when the reactor is open and accidents that may occur in the spent fuel pool. Are there procedures at Czech NPPs (as part of EOPs or other documents) for management of accidents at	

open reactor and in spent fuel pool that could be used for entry into SAMGs? What criterion of open reactor state was chosen in development of the additional SAMG chapters?

Answer At both Czech NPPs emergency operating procedures for shutdown states are part of EOPs. These procedures are generally used if the plant is operated in cold shutdown conditions or in refueling mode. Corresponding transitions to SAMG are included in these procedures. While using shutdown EOPs the reactor could be either closed or open. The main difference between closed and open reactor is availability of core exit temperature. If the reactor is closed – i.e. core exit temperature measurement is available – standard conditions for transition to SAMG based on core exit are used. If the reactor is open – i.e. core exit temperature measurement is not available – modified conditions for transition to SAMG are used based on containment or reactor hall dose rate measurement. Similarly for severe accident condition in spent fuel pool, transitions from shutdown EOPs to shutdown SAMGs are based on reactor hall dose rate measurement. Special computational aids to interpret fuel damage based on dose rate are used to evaluate conditions for transition to SAMGs.

Q.No	Article	Ref. in National Report
85	Article 14.1	para 9.1.2 page 71

Question/ Comment It is stated in para. 9.1.2 that "the PSA for reactor low-power operation and for shutdown, was developed in 1999".

What was the scope of shutdown PSA? Are all external and internal hazards (internal initiators, floods, fires, etc.) taken into account in shutdown PSA?

Answer Despite the fact that it is not very clear from the Question's wording whether this addresses the Temelin or Dukovany NPP PSA section, we assume this relates to the Dukovany PSA. The answer for the question is yes; all internal as well as external initiators (internal initiators, floods, fires, etc.) are within the scope of PSA, both for at power and shutdown modes of operation. In addition, the Level 2 PSA is being currently extended for shutdown modes of operation as well, however, this part of analysis shall be updated to address actions (see ANNEX 9 - National Action Plan on Strengthening Nuclear Safety of Nuclear Facilities in the Czech Republic) taken as a response to the Fukushima accident.

Q.No	Article	Ref. in National Report
86	Article 14.1	para 9.1.2, page 71

Question/ Comment Para. 9.1.2 provides information on the probabilistic safety assessment (PSA): on modeling of earthquakes and other hazards in PSA. How detailed was seismic PSA for Czech NPPs? What were probabilistic earthquake frequency distributions and associated probabilistic distributions of peak ground accelerations for each earthquake level? What method was used: seismic margin assessment in determining failures of components or damage analysis of structures, systems, and components?

Answer A seismic hazard analysis was conducted in detail for both plants. Site specific seismic hazard analyses were performed. The final output of the analysis was a set of seismic hazard curves which depict the annual frequency of exceeding different levels of ground motion (typically, the peak ground acceleration) at the Temelin and Dukovany sites. A family of hazard curves was developed to display the uncertainty in the seismic hazard. In addition, the ground response spectrum shape for use in the fragility analysis was examined. The seismic hazard at the plant was expressed in terms of the frequency of excess as a function of a parameter that characterizes ground motion acceleration, in our case, peak ground acceleration. EQE International, Inc. (EQE) conducted the seismic fragility evaluation of structures and equipment in Temelin NPP. Seismic response analysis performed was also used in this estimation. The results of the evaluation of the probabilities of failure resulting from an earthquake were given as fragility curves giving the probability of failure as a function of the same parameter used to characterize the seismic hazard, namely peak ground acceleration (PGA). The objective of the fragility evaluation was to estimate the ground acceleration capacity of a given component. This capacity is defined as the peak ground acceleration value at which the seismic response of a given component located at a specified point in the structure exceeds the component's resistance

capacity, resulting in its failure. The ground acceleration capacity of the component is estimated using information on the plant design bases, responses calculated at the design analysis stage, as-built dimensions, and material properties. Because there are many variables in the estimation of this ground acceleration capacity, component fragility is described by a family of fragility curves; a probability value is assigned to each curve to reflect the uncertainty in the fragility estimation.

Q.No	Article	Ref. in National Report
87	Article 14.1	9, Safety Assessment and Verification
Question/ Comment	The report describes periodic safety reviews (PSRs) carried out at both reactor sites. (1) Please discuss the findings of the PSRs, compared with those of the Stress Tests carried out in 2011. (2) Will the results of the Stress Tests guide the items to be evaluated in subsequent PSRs? (3) In addition, please elaborate on what decision criteria are used during a PSR to determine which modifications are “reasonable and practical” per the IAEA PSR guidance?	
Answer	<p>(1) Periodic safety reviews (PSR) at CEZ were carried out before the Fukushima accident. Applied safety standards (primarily WENRA and IAEA documents) did not cover all aspects verified during Stress Tests. However, the key findings were identified both in Stress Tests and PSR. These were necessities of severe accident preventive and mitigation design features (diverse water sources, hydrogen removal and corium stabilization) and procedures (Shut down SAMGs).</p> <p>(2) Experience gained from the Fukushima accident gives incentive to updates of international standards, which are used as bases for PSR scope and methodology. The Stress Tests results will be reflected in future PSR’s through this mechanism.</p> <p>(3) There are three levels of the decision-making process. The first level is based on defense in depth evaluation. Methodology is adopted from IAEA Safety Reports Series No. 12. Deviations with very low impact on defense in depth do not need to be resolved. The second level solves corrective action feasibility using engineering judgment. Some deviations could be practically irresolvable (E.g. return to criticality after SLB [steam line break] event). The third level is prioritization of corrective actions, taking into account the probability of deviation manifestation and consequences of this manifestation.</p> <p>Example: Severe accident preventive measures - Probability and consequences</p> <p>1.Loss of core cooling (loss of coolant reserve) - Sequences with loss of coolant out of containment – frequency $10E-7 \div 10E-9$ - No immediate impact on containment integrity</p> <p>2. Late containment damage by Molten Core – Concrete Interaction - Dominant sequence for late containment damage only - Consequences mitigated by 5th DID (defense in depth) level – off-site measures</p> <p>3. Containment damage by hydrogen deflagration and detonation - risk (with/without hydrogen elimination) early containment damage is 13% (based on sensitivity Probabilistic Safety Analysis studies) - 5th DID level can not be relied upon in a cessation of early containment damage (protective measures till 24 hour can not be realized - evacuation).</p> <p>A cost benefit analysis is currently under preparation.</p>	
Q.No	Article	Ref. in National Report

88	Article 14.2	14, p65-78
Question/ Comment	In the 6th National Report it is frequently mentioned that insights from probabilistic safety analyses are used for measures within the plant. How does the authority control the quality of the probabilistic safety analyses and the validity of these insights?	
Answer	<p>PSAs for both Czech NPPs were the subjects of the IAEA IPERS (IPSART) Missions. An independent assessment of both PSA studies initiated by the SÚJB was carried out by the Austrian company ENCONET Consulting in 2005. These independent reviews of PSAs were performed for use in regulatory decision-making according to the following guidelines:</p> <p>“Guidelines for independent review of PSA for regulatory DM“.</p> <p>This procedure establishes the principles of an independent review of plant-specific PSAs which are intended to be used for supporting the regulatory DM. The procedure defines a basic administrative framework for the management of the review process and provides comprehensive methodological guidance on the evaluation of technical adequacy and quality of plant-specific PSA. This evaluation should determine that the PSA intended for the specific application has an adequate technical scope and quality to be used for the specific risk-informed application.</p> <p>Czech regulatory authority has another guidelines at its disposal as well, “Requirements for PSA to be used for regulatory DM“. This procedure establishes basic requirements for the use of plant-specific PSA within the regulatory process. They include administrative requirements regarding the availability and role of PSA as part of the licensing process (e.g. Traceability of PSA status, QA aspects relating to PSA development, maintenance, etc.) and technical requirements that determine the adequacy and quality of plant-specific PSAs that are intended to be used in supporting the regulatory DM process.</p> <p>Inspections on the PSA at the both NPPs are performed regularly every year and have been since 2008. The PSA model is accessible on PC in NPP Dukovany at the resident inspector's office. The inspector can perform his own calculations if he wishes.</p> <p>Risk monitors in both Czech NPPs are available for regulatory review on PC at resident inspector's offices. Resident inspectors can perform their own checks of Safety Monitor calculations.</p>	
Q.No	Article	Ref. in National Report
89	Article 14.2	14, p65-78
Question/ Comment	Does the regulatory body execute independent checks with own measurement devices like nondestructive checks for instance X-ray or ultrasound methods in the plants?	
Answer	<p>SUJB does not execute any independent checks its with own measurement devices. SUJB inspections are focused on the verification of how licensees (applicants) comply with nuclear safety requirements as laid down by applicable legislation.</p> <p>The SUJB's inspection activity is partly based on verification results of inspections carried out by the licensee; inspectors assess the feasibility of the methods use for this purpose and verify the documents of inspections carried out by the licensee and contractors, including records associated with these inspections.</p>	
Q.No	Article	Ref. in National Report
90	Article 14.2	14, p68
Question/ Comment	<p>In the 6th National Report of the Czech Republic it is stated: ”Final Safety Analysis Report of Dukovany nuclear power plant and Temelín nuclear power plant is regularly updated (always the following year as at the end of the 1st quarter for Dukovany nuclear power plant and as at the end of the 1st half-year for Temelín nuclear power plant, changes in Final Safety Evaluation Report for the past Year are submitted to the SÚJB)”.</p> <p>Please provide some examples of plant modifications which are the reasons for changes in the Final Safety Evaluation Report.</p>	
Answer	The FSAR describes the current design of the NPP. For this purpose the annual upgrade of FSAR is	

required. All NPP design modifications shall be included into the FSAR. The proposed new content of the FSAR chapter impacted by the modification is attached to application for permit or report on change. Significant modifications during the last period - changing the fuel supplier (Temelin NPP), switching to another type of nuclear fuel (Dukovany NPP), design margin utilization projects – upgrade of power output (both NPPs), the I&C system modernization (Dukovany NPP).

Q.No	Article	Ref. in National Report
91	Article 14.2	14, p71 following
Question/ Comment	Related to the probabilistic safety analyses (PSA): Are the model uncertainties and statistical uncertainties shown in detail and taken into account in calculating the value of the damage frequency? Is the related error margin available? The table on page 71-73 (National Report) does not present such values.	
Answer	Yes, the standard uncertainty analysis of the results, both at total CDF and the individual aspects of the models, was conducted as the standard approach which is discussed in each PSA report. It is beyond the scope of this report to address every detail of PSA analysis or results including analysis results uncertainty, sensitivity, and importance measures of individual parts of probabilistic models. For analyzed list of initiating events for Unit 1 ALL modes of operation (at power including shutdown and outage modes of operation) the point estimate CDF of Dukovany NPP is 2,72E-05/year, mean value = 1.96E-05/year, confidence interval from 5th to 95th percentile (8.44E-6/year; 7.14E-05/year). For Temelin NPP values are as follows: point estimate 1.49E-05/year, confidence interval from 5th to 95th percentile (3.96E-07/year; 3.62E-04/year). When using plant-specific reliability data gathered from commissioning time till 2010, the CDF point estimate is 1.39E-05/year, while confidence interval from 5th to 95th percentile is (1.08E-05/year; 2.78E-05/year).	
Q.No	Article	Ref. in National Report
92	Article 14.2	14, p71 following
Question/ Comment	How exactly are common cause failures (CCF) taken into account in the probabilistic safety analyses? With which probability is a failure of a system rated if triggering events have redundant cross impacts?	
Answer	Common Cause Failures (CCFs) are modeled in a standard way in both plant PSAs. The standard modelling approach of CCFs is used in the PSAs, which follows corresponding IAEA guidelines for PSA analyses, is therefore also for CCF modeling. For the Dukovany NPP the Alpha factor approach is used, for Temelin the well-known MGL (Multiple Greek Letter) model is adopted, while combined Beta and Alfa factors model have been used initially. The way of CCF modelling was carefully examined by various PSA review missions. It is not clear what is meant by “triggering events”, actually. Whether this means events triggering some subsequent accident consequences (e.g. causing multiple equipment unavailability across different equipment) which probably means CCF in fact, or initiating events of accident sequences. The first type of events are analysed in the frame of CCF analysis, the latter by initiating an events analysis and considered also in the event/fault tree as IEs consequential events (dependency matrix analysis).	
Q.No	Article	Ref. in National Report
93	Article 14.2	14, p71 following
Question/ Comment	Are aging effects in the probabilistic safety analysis (PSA) also considered in the way that the failure rates of the components are depending of its age? The bathtub curve shows that such effects are important.	
Answer	No, the standard and recommended component unavailability models of the component failure rates are used in the PSAs. Aging effects are involved in the models indirectly only through the plant-specific component reliability data gathering, analysis and periodical update of such new reliability data from operational experience in time intervals prescribed by the internal guiding documentation. No special aging models for unreliability vs. equipment aging are used, neither for active/passive components nor initiating event frequencies. Only plant-specific unreliability records gathered from the plant operational logs/experience are used, which is the common practice used in the IAEA PSA guideline requirements.	
Q.No	Article	Ref. in National Report

94	Article 14.2	Sub-section 9.1.2, page 67
Question/ Comment	It is stated: "Inspections of compliance with additional requirements are executed during outages,...". Please elaborate on the additional requirements.	
Answer	The additional requirements are the internal documents such as the limits and conditions and/or operational procedures and/or previous SUJB licensing decision conditions.	
Q.No 94	Article Article 14.2	Ref. in National Report Sub-section 9.1.2, page 67
Question/ Comment	It is stated: "Inspections of compliance with additional requirements are executed during outages,...". Please elaborate on the additional requirements.	
Answer	The additional requirements are the internal documents such as the limits and conditions and/or operational procedures and/or previous SUJB licensing decision conditions.	
Q.No 95	Article Article 14.2	Ref. in National Report Page 71-72, Chapter 9.1.2
Question/ Comment	Are these human activities or something else the causes of the increase of CDF, FDF and LERF in comparison with the values in 2010?	
Answer	Indeed, compared to 2010, the CDF value increased slightly, approximately a factor of 2.5 up to the 2.72E-05/year for 1st Unit of Dukovany NPP (and similarly for other Units). The main (but not only) reason for this CDF increase, compared to the 2010 CDF, was caused by the model annual update(s) reflecting a more realistic additional SG emergency feedwater supply using ALSO mobile means based upon new analyses results. These analyses took into consideration more realistic conditions for required I&C parameters control including I&C power supply restoration following blackout conditions appearance, which means power restoration using 1) new portable power supply devices but on the other hand 2) newly introduced power restoration human errors (HEPs) under more difficult severe accident conditions.	
Q.No 96	Article Article 14.2	Ref. in National Report Appendix 6
Question/ Comment	Evaluation of the Safety Performance Indicators Set referred to in Appendix 6 of the Report on page 4 states that the indicator (test result) describing the status of confinements demonstrates that the period from 2001 to 2012 shows a trend towards a systematic improvement of Dukovany NPP confinement leak-tightness. Could you please explain, by which measures this has been achieved?	
Answer	The improvement of Dukovany NPP confinement tightness is a long time issue which has been given due attention from ÈEZ. After 1997, ÈEZ started to solve containment tightness issues addressed comprehensively in cooperation with the VUEZ Levice company. Using the experience of Slovak and Hungarian power plants, ÈEZ added monitoring to the simple repairs of defects found during leak test (periodically integrated overpressurized test, done 1x2 years for every unit. This means that confinement is overpressured for 50kPa and a visual inspection is done in external pressure boundary with a search for leaks, which are subsequently repaired). With monitoring, ÈEZ gets an overview of rough fault localization hidden in hermetic nodes on each unit (there are differences between units). Then ÈEZ gradually (mainly using grouting technology for hermetic hidden nodes) improved the overall tightness. ÈEZ also checked the tightness of the individual elements of the confinement boundary and made minor changes. It still continues to use the experience of other plants of VVER 440 type. In addition to an increase in the hidden hermetic nodes tightness (mostly defects from the construction period), leak issues have begun to occur in relation to the aging of structures and the impact of degradation factors.	
Q.No 97	Article Article 15	Ref. in National Report 10.1.1, p80
Question/	One of the obligations of radiation protection is "to minimize the produced quantity of radioactive	

Comment wastes". Such an obligation leads to avoid generating a high liquid effluent quantity by keeping any hot zero power condition during a longer time while priority to safety (art. 10) would lead to shorten the hot zero power duration. How are these two opposite objectives managed by Dukovany and Temelin NPPs?

Answer The hot zero power condition is timely limited by high level procedures at the Temelin NPP and the Technical Specifications at the Dukovany NPP. The limit of 72 hours is considered to be optimum with respect to safety, effluent quantity, and economy.

Q.No	Article	Ref. in National Report
98	Article 15	Page 83, Section 10.1.2

Question/ Comment It is mentioned that a dose constraint for a nuclear installation operation shall be a collective effective dose of 4 Sv per year for each Gigawatt being installed in the nuclear installation related to the exposure of all exposed workers who undergo personal monitoring in compliance with the monitoring program. Please provide some values for the collective effective dose in the NPPs in comparison to this constraint.

Answer The collective dose constraint of 4 Sv per Gigawatt installed is still a legislative requirement, albeit based on historical recommendations and assumptions. The relevant RP Decree is under revision right now. The actual collective effective doses in mSv for Czech nuclear power plants are in the table below -

NPP/2010/2011/2012/2013:

Dukovany 1/ 113.2/ 232.2/ 100.0/ 122.6
Dukovany 2 / 78.6/ 77.4/ 181.2/ 119.8
Dukovany 3/ 120.6/ 106.5/ 99.1/ 157.5
Dukovany 4/ 233.0/ 75.9/182.5/180.6
Temelin 1/ 96.1/90.8/82.6/80.9
Temelin 2/ 66.3/145.4/ 79.1/ 82.7

Q.No	Article	Ref. in National Report
99	Article 15	Section 10.1.2, Page 83

Question/ Comment Czech Republic may like to share the criteria for establishing the dose constraint value of collective effective dose of 4 Sv per year for each gigawatt .

Answer The collective dose constraint of 4 Sv per Gigawatt installed is still a legislative requirement, albeit based on historical recommendations and assumptions. The relevant RP Decree is under revision right now. The actual collective effective doses in mSv for Czech nuclear power plants are in the table below -
NPP/2010/2011/2012/2013:

Dukovany 1/ 113.2/ 232.2/ 100.0/ 122.6
Dukovany 2 / 78.6/ 77.4/ 181.2/ 119.8
Dukovany 3/ 120.6/ 106.5/ 99.1/ 157.5
Dukovany 4/ 233.0/ 75.9/182.5/180.6
Temelin 1/ 96.1/90.8/82.6/80.9
Temelin 2/ 66.3/145.4/ 79.1/ 82.7

Q.No	Article	Ref. in National Report
100	Article 15	Section 10.1.2, Page 83

Question/ Comment Czech Republic may like to share the results of occupational radiation exposure of the nuclear power plant personnel for the reporting period.

Answer The collective dose constraint of 4 Sv per Gigawatt installed is still a legislative requirement, albeit based on historical recommendations and assumptions. The relevant RP Decree is under revision right now. The actual collective effective doses in mSv for Czech nuclear power plants are in the table below -
NPP/2010/2011/2012/2013:

Dukovany 1/ 113.2/ 232.2/ 100.0/ 122.6
 Dukovany 2 / 78.6/ 77.4/ 181.2/ 119.8
 Dukovany 3/ 120.6/ 106.5/ 99.1/ 157.5
 Dukovany 4/ 233.0/ 75.9/182.5/180.6
 Temelin 1/ 96.1/90.8/82.6/80.9
 Temelin 2/ 66.3/145.4/ 79.1/ 82.7

Q.No	Article	Ref. in National Report
101	Article 15	10.1.2, Page 83

Question/ Comment Czech Republic may please provide the results for the gaseous and liquid effluents for the reporting period.

Answer In the attached file you will find the requested effluence results for the Dukovany and Temelin NPPs.

Support » CZ-

Documents answer to question posted by Pakistan

Q.No	Article	Ref. in National Report
102	Article 15	Pg. 83

Question/ Comment Could you provide a summary of the occupational dose data for each unit of Dukovany and Temelin NPP for the last three years?

Answer The collective dose constraint of 4 Sv per Gigawatt installed is still a legislative requirement, albeit based on historical recommendations and assumptions. The relevant RP Decree is under revision right now. The actual collective effective doses in mSv for Czech nuclear power plants are in the table below - NPP/2010/2011/2012/2013:

Dukovany 1/ 113.2/ 232.2/ 100.0/ 122.6
 Dukovany 2 / 78.6/ 77.4/ 181.2/ 119.8
 Dukovany 3/ 120.6/ 106.5/ 99.1/ 157.5
 Dukovany 4/ 233.0/ 75.9/182.5/180.6
 Temelin 1/ 96.1/90.8/82.6/80.9
 Temelin 2/ 66.3/145.4/ 79.1/ 82.7

Q.No	Article	Ref. in National Report
103	Article 15	82

Question/ Comment Could you provide a summary of the gaseous and liquid discharged by each unit of Dukovany and Temelin NPP for the last three years?

Answer In the attached file you will find the requested effluent results for the Dukovany and Temelin NPPs.

Support » CZ-

Documents answer to question posted by Spain

Q.No	Article	Ref. in National Report
104	Article 15	10.1.1

Question/ Comment The criteria für categorisation of workplaces, where the radiation activities are performed, are divided into workplaces of categories I. to IV.

The specification of the four different workplaces shall be given. Is only the dose rate relevant for the classification or as well the contamination rates (surface and air)?

Answer SUJB Decree No. 307/2002 Coll., on Radiation Protection, as amended:
 The workplaces which perform radiation activities, with the exception of the workplaces using only an insignificant source, shall be categorised in ascending order according to a hazard caused by ionizing radiation to health and the environment into categories I, II, III, and IV on the basis of:

- classification of ionizing radiation sources to be handled at the workplaces;
- expected normal operation of the workplace and a related measure of possible occupational and public exposures;
- orientation of radiation activity and difficulties of ensuring radiation protection and quality during this activity;
- the equipment and methods of work safety at the workplace with ionizing radiation sources, especially by use of protective aids, insulation and shield equipment, ventilation and drainage;
- possible radioactive contamination of the workplace or its vicinity by radionuclides;
- possible generation of radioactive waste and difficulties of its disposal;
- potential risk arising from predictable malfunctions and deviations from normal operation; and
- risk of a radiation incident or radiation accident, magnitude of consequences of such event and the possibilities of interventions.

Q.No	Article	Ref. in National Report
105	Article 15	10.1.2

Question/ Comment The effective dose limit for occupational exposure of the personal should not exceed 50 mSv/year. Will this value soon be reduced to 20 mSv as in the most European countries?

Answer The Czech Republic is currently preparing a new Atomic Act and its implementing regulations. The limit of effective dose for an exposed worker of 20 mSv per calendar year is incorporated in the draft decree on radiation protection.

Q.No	Article	Ref. in National Report
106	Article 15	10.1.2

Question/ Comment A dose constraint for a nuclear installation operation shall be a collective dose of 4 Sv per year for each gigawatt being installed in the nuclear installation related to the exposure of all exposed workers who undergo personal monitoring in compliance with the monitoring program. The collective doses for the NPPs in Czech Republic shall be presented plus the highest individual dose accumulated in each plant. The collective dose per gigawatt seems to be very high also in comparison with other VVER plants. Therefor an explanation for this high value would be welcome.

Answer The collective dose constraint of 4 Sv per Gigawatt installed is still a legislative requirement, albeit based on historical recommendations and assumptions. The relevant RP Decree is under revision right now. The actual collective effective doses in mSv for Czech nuclear power plants are in the table below - NPP/2010/2011/2012/2013:

Dukovany 1/ 113.2/ 232.2/ 100.0/ 122.6
 Dukovany 2 / 78.6/ 77.4/ 181.2/ 119.8
 Dukovany 3/ 120.6/ 106.5/ 99.1/ 157.5
 Dukovany 4/ 233.0/ 75.9/182.5/180.6
 Temelin 1/ 96.1/90.8/82.6/80.9
 Temelin 2/ 66.3/145.4/ 79.1/ 82.7

Q.No	Article	Ref. in National Report
107	Article 16.1	16, p86-104

Question/ Comment Are the used measuring instruments for detection of radioactivity, pressure and temperature functioning also in case of high radioactivity, pressure and temperature as it can be in a severe accident?

Answer CEZ NPPs are equipped with robust I&C safety systems qualified to perform under severe accident conditions as well as in post-accident monitoring.

Q.No	Article	Ref. in National Report
108	Article 16.1	Page 97, Section 11.1.2
Question/ Comment	In respect to Fig 11-4, could you clarify if the diagram means that crisis plans are available for all levels of the government (state, district and municipal) and off-site emergency plans are only available for the district and municipal level. Where do CEC and CEPC fit into this diagram? Also, the report mentions 3 degrees of extraordinary event. Does this diagram apply only to the 3rd degree event? Is the crisis staff shared by all levels of the government or does each level have their own?	
Answer	Figure 11-4 means that the crisis plans must be elaborated at each level, and each institution with its own crisis plan has to proceed according to them. The same applies for the off-site emergency plan. These plans have to be elaborated at the district level, and the district and municipal levels should proceed according to this off-site emergency plan. And yes of course, they are available for all of the levels.	

The Civil Emergency Planning Committee is a permanent working body of the National Security Council and functions in the planning and preparedness phase; during an emergency the Central Crisis Staff works. The Civil Emergency Planning Committee is therefore inactive during an emergency.

Yes, this diagram applies to the 3rd degree event.

Each level or institution has its own crisis staff.

Q.No	Article	Ref. in National Report
109	Article 16.1	Page 100, section 11.1.2
Question/ Comment	Please explain why there is a difference in planning zone between the two NPPs (20km around Dukovany and 13km around Temelin).	
Answer	The difference in the emergency planning zones consists in different features of the NPPs. The extent of both the emergency planning zones was determined on the base of the assessment of the impact of a severe accident into the NPP environs.	

Q.No	Article	Ref. in National Report
110	Article 16.1	11.1.2, p100
Question/ Comment	Are the provisions related to iodine prophylaxis checked at inhabitants' homes?	
Answer	No, they are not. The licensee doesn't have the right to check iodine at inhabitants' homes. The operating organization merely provides an exchange of iodine prophylaxis before the expiration date.	

Q.No	Article	Ref. in National Report
111	Article 16.1	11.1.2, p103
Question/ Comment	"Emergency preparedness within the emergency planning zone according to off-site emergency plan is also checked at least once in 3 years" Does it include real people evacuation and all related supplies?	
Answer	Yes, it does. There were some institutions, such as schools or offices, which are evacuated as part of exercises ZONA. All related supplies such as evacuation assets, reception points, and emergency accommodations, and the like were exercised as well.	

Q.No	Article	Ref. in National Report
112	Article 16.1	p. 241/257 or p. 59/75 para 4.2.4
Question/ Comment	In National Action Plan, it is explained that one of the recommendation of emergency preparedness and response is increasing emphasis on drilling with neighbouring countries. Could you elaborate the arrangements covering all kinds of emergency scenarios on drilling with neighbouring countries ?	
Answer	The Czech Republic conducted an exercise with Slovakia and regularly conducts exercises with Austria. A separate scenario is prepared for each exercise. We don't expect a document containing every type of	

scenario to be elaborated.

Q.No	Article	Ref. in National Report
113	Article 16.1	100
Question/ Comment	The emergency planning zones of the two sites are of different size. Why 20 km for Dukovany and 13 km for Temelin, given the fact that the power, and hence the inventory, is larger for the Temelin plant?	
Answer	<p>The reason is the different types of nuclear reactors and different types of hermetic zones/containments; i.e. different results of the safety analyses.</p> <p>Both emergency planning zones (EPZ) are set by international standards and Czech national legislation. On the basis of these documents the licensee prepares a proposal of the EPZ, and SÚJB issues a decision on EPZ.</p>	
Q.No	Article	Ref. in National Report
114	Article 16.1	p.104
Question/ Comment	ZONE 2013 exercise took place in 2013. What are the main outcomes/lessons learnt from the exercise?	
Answer	<p>The exercise of ZONA 1013 examined the skills of the crisis management to provide an emergency response after a possible nuclear emergency and not only this, but also the response after any possible disaster.</p> <p>Also very beneficial were the exercises of communication lines between all the emergency responders in the Czech republic, and exercising communication abroad.</p> <p>The main benefit of these ZONA exercises was that the solving of a radiation accident is coordinated by the Government of the Czech republic.</p> <p>The crisis documentation was approved and issues for its enhancing were found.</p> <p>The ability for a radiation monitoring network (RMN) to the monitor radiation situation under emergency conditions were approved, as was the coordination between each of its elements. The method of control of RMN was also approved.</p> <p>The ZONA exercise enhanced public awareness of the nuclear emergency issue.</p>	
Q.No	Article	Ref. in National Report
115	Article 16.1	89
Question/ Comment	Does the regulation established emergency dose limits for workers during an emergency or there exists any regulatory guidance in relation to this subject?	
Answer	<p>In the report to the 2nd Extraordinary Review Meeting (pg. 143), a revision of intervention levels serving for the classification of emergency events and for starting the intervention activities was planned. Could you explain the progress achieved in this subjects and provide the results if available?</p> <p>According to the Atomic act and the SUJB Decree on radiation protection, the dose limit for an emergency worker is set to 200 mSv. Emergency workers shall be demonstrably informed about the risks relating to such an intervention and shall participate in the intervention on a voluntary basis only. The Atomic Act as well as the SUJB Decree on radiation protection are under revision now. The new EU directive will be implemented.</p>	
Q.No	Article	Ref. in National Report
116	Article 16.1	Pg. 100
Question/ Comment	In the report to the 2nd Extraordinary Review Meeting (pg. 143), a discussion on the contents of the off-site emergency plan was planned. Could you explain the progress achieved in this subjects and provide the results if available?	
Answer	<p>The off-site emergency plans in the Czech Republic are updated on regular base after the exercise ZÓNA. Updates to the off-site emergency plans are set by legislation, and these updates run every 3 years.</p>	
Q.No	Article	Ref. in National Report

117	Article 16.1	Pg. 92-94
Question/ Comment	The simultaneous occurrence of a severe accident in several units and extreme external events cannot be disregards after the Fukushima accident. Does the current on-site emergency organization have enough human resources to manage this situation? Is any increase in the shift operation personnel been decided?	
Answer	The number of TSC (Technical Support Centre personnel) has increased – there is a new position of “Technologist 2”, some positions of TSC increased from 4 shift workers to 5 shift workers, and the number of plant Fire rescue service staff (electricians) has also increased. At present we have enough human resources to manage extraordinary events.	
Q.No 118	Article Article 16.1	Ref. in National Report Pg. 92-94
Question/ Comment	Have the licensees established some kind of arrangement or support for the air transportation to the plants of equipments which might be used in case of extreme external events with massive destruction of buildings, infrastructure and damaged communications?	
Answer	The licensee doesn't establish arrangements or support for air transportation of equipment needed in case of extreme external events. The licensee has made several arrangements in the event of extreme external events and gradually equips the facility with heavy machinery such as a digger, truck, tank with fuel, etc.	
Q.No 119	Article Article 16.1	Ref. in National Report Pg. 100
Question/ Comment	During the Fukushima accident was necessary to take protective measures further than the 30 km radius zone around the plant. Have the current off-site emergency planning enough flexibility to be prepared to act outside this zone if necessary?	
Answer	Off-site emergency plans are elaborated for the EPZs. In the event of a radiation accident with impacts beyond the EPZ, it is possible to implement a number of measures for the population protection as elaborated in the Off-site emergency plan (e.g. sheltering, iodine prophylaxis, evacuation or agricultural measures).	
Q.No 120	Article Article 16.1	Ref. in National Report Pg. 103
Question/ Comment	According to the report, on-site and off-site exercises are regularly performed. The question is related to the scope and content of those exercises. Has been carried out recently a general full-scale off-site emergency exercise, involving all the organizations that have assigned some responsibilities and including protective measures such as evacuation of part of the population surrounding a NPP?	
Answer	Yes it has. The full-scale exercise ZONA involves all the organizations that have been assigned some responsibilities. There were some institutions, such as schools or offices, which were evacuated as part of the ZONA exercises. All related supplies like evacuation assets, reception points, emergency accommodations and the like were exercised as well.	
Q.No 121	Article Article 16.1	Ref. in National Report p.109
Question/ Comment	"The report states that in case the MCR is uninhabitable, the MCR personnel perform their activities from the ECR." What are the key requirements for habitability of the ECR (e.g. supply of fresh air, radiation protection from the exposure of a venting, food and water supply for the shift)?	
Answer	The requirements on performing of actions from ECR are generally provided for by DBA. This means that the ECR should be habitable and operable to ensure residual heat removal for a sufficient time. It means that all necessary systems providing such conditions to enable the execution of corresponding actions should be operable after DBA. Last year in 2013, a project to improve MCR and ECR habitability of all units during a basic design	

accident was completed including external hazards (isolation mode with emergency cooling system, overpressure mode with new filtroventing system, etc.). No requirements for an ECR concerning food and water supply for the shift are established for ECR.

Currently an analytical project for the evaluation of MCR and ECR habitability during severe accidents is in progress. Based on the results of this project, the necessary measures (if any) will be proposed to enable the execution of actions even during severe accidents.

Q.No	Article	Ref. in National Report
122	Article 16.1	11.1.2, p.100
Question/ Comment	"According to the report, the emergency planning zones are defined as the territory 20 km around Dukovany NPP and 13 km around Temelín NPP. Iodine prophylaxis is distributed in advance to the population within the emergency planning zone." For a severe accident like in Fukushima, how would the Czech Republic respond with respect to the iodine prophylaxis beyond the emergency planning zone?	
Answer	The NPP operator has a reserve of KI pills available that could be distributed even beyond the emergency planning zone. Other KI pills are available for sale in pharmacies.	

Q.No	Article	Ref. in National Report
123	Article 16.1	11 EMERGENCY PREPAREDNESS
Question/ Comment	The report mentions that emergency preparedness exercises are held every three years. (1) Please provide some examples of weaknesses identified in some of these exercises, and corrective actions carried out to address them. (2) What was the role of the regulator and licensee during these exercises and in the implementation of corrective actions?	
Answer	1) In the past, the responsibility for solving the radiation accident was given to the regional and municipal offices, but after experiences from these exercises, the strategy for solving the radiation accident was revised, and the responsibility was given to the state authorities but led by the Government. Based on these exercises, a plan of communication with the public, for example, was also elaborated. 2) The licensee exercises the on-site emergency plan. The role of SÚJB as a regulator is to: assess the technology of the NPP, monitor and assess the radiation situation and, based on the assessment of the radiation situation, SÚJB should propose, to the government and to the head of the accident region, measures to protect the population and the environment. The plans are updated based on the results of the exercise.	

Q.No	Article	Ref. in National Report
124	Article 17.1	115
Question/ Comment	CEZ has submitted Initial Safety Analysis Report for siting. It is said that it includes data for design concept and quality issues. Are all participating vendor designs included in this application and each design evaluated separately?	
Answer	The Initial Safety Analysis Report prepared by the applicant CEZ covers all participating vendor designs. This has been done in two ways; for the majority of safety relevant questions and, when applicable, the applicant has used a so-called envelope approach using the least favorable characteristics covering, with margins, all candidate designs; for some aspects the descriptions and analysis were done in alternatives.	

Q.No	Article	Ref. in National Report
125	Article 17.1	108
Question/ Comment	The Peer Review of the European stress tests concluded in the area of earthquake assessment, that SÚBJ should continue to monitor the proposed measures for the resolution of:	
	<ul style="list-style-type: none"> • Reinforcement of Dukovany NPP to ensure that all the safety related SSCs of the plant are resistant for 	

at least 0.1g PGA.

- Actions to increase the plant's capabilities to cope with the indirect effects of an earthquake and other external events.

- Low seismic margins for Dukovany cooling towers serving as heat sink for ESW.

Could you provide some information on the status of implementation of those measures?

Answer

As for the 0.1 g PGA – an "Evaluation due to the requirement of Pre-operational Safety Report for the Dukovany NPP and the IAEA safety standards on resistance of safety important building structures in relation to the effects of extreme climate conditions with very low annual frequency of 10⁻⁴ per year". was carried out. Four corrective measures were defined for unsatisfactory assessment:

- Buildings strengthened against extreme weather phenomena at Dukovany NPP (implementation 12/2014).

- Fire brigade buildings strengthened at Temelin NPP (implementation 12/2014).

- Fire brigade buildings strengthened at Dukovany NPP (implementation 12/2014).

- Procurement of a fire brigade truck equipped with necessary devices to cope with selected severe accidents – Dukovany and Temelin NPP (implementation 1/2014).

As for the indirect effects of an earthquake and other external events – the possible secondary effects of seismic events, such as flood or fire arising as a result of the events initiated after the occurrence of a seismic event, were evaluated in the PSA risks study (made in 2012).

As for the possible collapse of the Dukovany water cooling towers– new induced draught cooling towers for emergency cooling water will be built at Dukovany NPP in 2014-2016.

Q.No	Article	Ref. in National Report
126	Article 17.1	109-112

Question/ Comment In the stress test Peer Review process it was identified that the procedures for special handling of weather related threats needed to be elaborated. The organizational arrangements to ensure the necessary staff in case of lasting extreme weather conditions have to be elaborated. The considerations for extreme low temperatures may be too simple, not taking into account the realistic related effects, e.g. station blackout. Some refined further analyses and verification of current analyses are judged to be necessary.

Could you provide some information on the status of implementation of those measures and the advance experienced since the report was provided?

Answer

Specific techniques were developed, and new procedures for managing extreme conditions (wind, temperature, snow, earthquakes) were issued at both nuclear plants. The technology reinforcements (emergency diesel generators at Temelin NPP, Emergency Control Centre at Dukovany NPP) were implemented.

To ensure the availability of staff for long-term support of complicated technological solutions for extraordinary events:

- sufficient capacity and staff professionalism is planned for events affecting the site,
- long-term external technical capacity and professional support is contracted for the site.

On both plants, the key specialists were identified and engaged. These specialists will not be evacuated in case of an accident, and their expertise will be used for Emergency Response organization support in crisis situation management. External expert support during severe accidents will be organised within WANO Moscow Centre mutual assistance.

The analyses carried out include:

- robustness analysis and the possibility of strengthening external power lines (Dukovany and Temelin NPP),

- feasibility study of heat transfer from the SFSP without an additional water supply (Temelin NPP, at Dukovany in progress),

- analysis of Main Control Room (MCR) and Emergency Control Room (ECR) habitability during severe

accidents, including analysis of influence on the MCR and ECR of unaffected unit (Dukovany and Temelin NPP),
 - impact analysis of NPP intentional air attack (Dukovany and Temelin NPP).

Currently an analysis of SG gravitational filling (Temelin NPP) and analysis of long-term preservation of the containment integrity (stabilization of the melt and pressurisation prevent - Temelin NPP) are being carried out.

Q.No 127		Article Article 17.1	Ref. in National Report p.109
Question/ Comment	Is the water intake at Dukovany NPP protected from floods and debris in the river, or does Dukovany NPP site have some alternative water source in case of unavailability of the preferred heat sink?		
Answer	The intake facility is equipped with coarse bars to capture large debris. At the entrance to the pump, suction tanks are equipped with a mechanically raked bar screen to capture small debris. It is shown that the pumping station would not be compromised in the event flow Q1000 in the Jihlava River. In the event of loss of pumping station Jihlava, water supplies for the fulfillment of safety functions correspond to about 30 days (providing with current early shutdown of units). Until then, an alternative source of water can be deployed - for example drinking water piping, import water in tankers, or repair of the original source.		
Q.No 128		Article Article 17.2	Ref. in National Report 17, p112
Question/ Comment	In The 6th National Report of the Czech Republic the expression “design aircraft” is not used related to Temelin NPP. Does this indicate, that other types of aircrafts than the above mentioned “design aircraft” were used in assessment for Temelin NPP?		
Answer	Selected structures are assessed on a plane crash weighing 7 tons and a speed of 100 m/s. In addition, some structures are assessed to impact aircraft weight of 20 tons at a speed of 200 m/s.		
Q.No 129		Article Article 17.3	Ref. in National Report 17, p109
Question/ Comment	In the 6th National Report of the Czech Republic it is stated: “The analyses (for Dukovany nuclear power plant) have shown that the power plant is sufficiently protected against the effects caused by the impact of so-called “design aircraft”, model-equivalent to a civil or military aircraft.” Can you please provide more details about the “design aircraft“ and whether you have assessed not only the crash caused by an accident but also an impact caused by an forced plane crash?		
Answer	As a design reference aircraft, a small plane of civil category weighing 2000 kg - Cessna 210 is used. The impact speed of 100 m/s is considered for analyses. Analyses of intentional aircraft attack are processed. This analyses, however, is subject to strict confidentiality.		
Q.No 130		Article Article 18.1	Ref. in National Report 18, p117-120
Question/ Comment	How many redundancies are available for the safety systems (pumps, valves, pipes, cables, I&C systems etc.) at NPPs Dukovany and Temelin? Are the redundancies completely spatially separated, independent and able to handle the passive and active single failure during an inspection or repair of one redundancy?		
Answer	For active safety systems, the concept of 3 × 100% of backup is designed. Each system is divided into three separate and independent divisions. Each division separately and independently provides appropriate protection, control, executive, and support functions of the system and is able to perform at 100% of the required safety functions. Backup and resistance against a single failure is thus maintained even for the unavailability of one division (the period of unavailability, however, is limited in Limits and Conditions).		
Q.No		Article	Ref. in National Report

131	Article 18.1	13.1.3, p121
Question/ Comment	<p>"Extract of the report: "Personnel and the vicinity of the nuclear power plant are protected against consequences of any severe accidents by physical barriers comprised of: nuclear fuel matrix [...], fuel rods cladding [...], primary circuit [...], containment – pre-stressed concrete dome [...]."</p> <p>In case of severe accident, one or several barriers above is/are no more functional. Moreover, the failure of the primary circuit may leads to the cooling loss which might leads 1/to the destruction of the fuel rods cladding and the fuel matrix and 2/ to the destruction of the containment basemat or the containment itself due to pressure peak when the corium is cooled but the heat is not properly removed from the containment."</p>	
Answer	<p>That is correct. The definition of a severe accident (beyond design basis accident with fuel melt) includes the assumption that at least the fuel matrix and fuel cladding are no more functional.</p> <p>The original (Czech) version states: "Personnel and the vicinity of the nuclear power plant are protected against consequences of any potential accidents by physical barriers comprised of:[...]". We apologize for any confusion that was caused by the translation to English.</p>	

Q.No	Article	Ref. in National Report
132	Article 19.1	135

Question/ Comment	<p>Could you provide a summary of the relevant events occurred during the review period in the Czech NPP and their INES rating?</p>	
Answer	<p>In the Temelin NPP, 12 events were evaluated as INES0 in 2013. No event evaluated as INES1 occurred in 2013.</p> <p>In the Dukovany NPP, 5 events were evaluated as INES0 in 2013. No event evaluated as INES1 occurred in 2013.</p> <p>Evaluation of events that occurred in January 2014 on both NPPs is in progress now.</p> <p>A table including a list of events is attached, for other years, please see the website http://www.sujb.cz/fileadmin/sujb/docs/zpravy/narodni_zpravy/CZ_NR_2013_ANNEX_6_Indicators.pdf</p>	
Support Documents	<p>» CZ- answer to question posted by Spain</p>	

Q.No	Article	Ref. in National Report
133	Article 19.2	Page 131, Chapter 14.1.3

Question/ Comment	<p>Please, give a more detailed description on the usage of these logical complexes? What kind of benefit has been gained by its usage? Is it possible to measure this benefit with the key indicators?</p>	
Answer	<p>Maintenance ;V Agreements strategy change</p> <p>Before 2007: Each power plants had separate contracts for maintenance activities (cca 700 contractors). After 2007: Maintenance ;\$Frame contracts;" are signed in headquarters for a 5 year period with companies who have the technological competence to improve the performance of technology or decrease maintenance costs.</p> <p>The frame contract includes the main principles of relation between client and contractor, i.e.:</p> <ul style="list-style-type: none"> „X- Long term strategic partnership, „X- Rules for cooperation, „X- WIN ;V WIN principle, „X- Price limits for individual contracts negotiation. <p>Each power plant is divided into "Logical complexes" (LC). Logical complexes have a precisely defined function as described in Key Performance Indicators.</p>	

LC structure for a typical nuclear power plant:

Primary circuit

Turbine hall

Auxiliaries

I&C

Electro

Other

Maintenance system

A frame contract is established for each LC. This contract covers both NPPs.

The frame contract defines basic principles of cooperation and partnership, sets rules and price limits for individual maintenance contract negotiations at each NPP.

Individual maintenance contracts are set for each LC and power plant.

The individual contracts are based on "Target price" mode.

Target price contracts - Contract subject:

Maintenance management and technical support on equipment

Preventive and predictive maintenance

Corrective maintenance

Individually calculated projects (optionally)

Spare parts and material supplies (optionally)

Service management:

- Maintenance will be managed using the maintenance control system (Asset Suite 6-(INDUS Passport)
- Preventive maintenance will be performed according to the annual maintenance plan (agreed by both sides and enclosed in the contract)
- Corrective maintenance will be based on individual work-orders
- All performed work will be based on work orders and the contractor will have to fill the relevant data into the CEZ maintenance control system (Asset Suite 6 - INDUS Passport)
- The standard attachment to all contracts will be a set of "binding contractor's documentation", which covers all relevant guides, regulations and other rules for maintenance on CEZ plants.

Periodic Monthly meetings:

- In order to generate BONUS, the contractor has the right to suggest optimization of maintenance.
- This can be done either by increasing the contractor's productivity (CEZ is obliged to accept such modifications when they are not against regulations) or by maintenance program optimization (in this case, the maintenance program modification must be approved by CEZ).
- Both parties will agree (based on the contractor's or the client's suggestions) on the modified maintenance program for the next month.
- The maintenance program modifications will be supplemented by a technical and economic analysis of savings (for BONUS calculation at the end of the year).
- The client informs contractor about relevant criteria (KPIs) which were violated during the actual month (the PENALTY will be calculated based on these criteria at the end of the year).

Periodic annual meetings:

- In the second half of year, the negotiations about new maintenance program for the next year begin.
- At the end of the year, the contractor prepares the annual calculation in which relevant BONUSSES are calculated based upon the monthly summaries.
- The customer prepares the penalty calculation in which relevant PENALTIES are calculated based upon the monthly summaries.

- BONUS = Increase of contractor's profit. The basic profit will be increased by 50% of the calculated costs savings.

- PENALTY = Decrease of contractor's profit. Based on individual penalties (throughout the year) for violation of equipment KPIs defined in the contract:

„o penalty 1 (equipment availability below 85%) ... penalty 8 %

„o penalty 2 (incorrect maintenance data in Passport system) ... penalty 1 %

„o K

Target price re-negotiation:

- Based on materials prepared by both contractor and client, both parties will elaborate the maintenance program for the next year. This will be connected with target price re-negotiation, the reasons being, for example:

„o- Increase of equipment volume (e.g. installation of new equipment)

„o- Decrease of equipment volume (e.g. removal of old equipment)

„o- Significant change in maintenance program

„o- Significant change in non-controllable costs (e.g. spare parts, etc.)

„o- Other situations which will result in the target price to be exceeded by more than 10%

If both parties don't agree on the new maintenance program, the actual one remains valid.

Q.No	Article	Ref. in National Report
134	Article 19.7	Page 128, Chapter 14.1.3

Question/ How, when, and by whom are these indicators measured?

Comment Are they measured quantitatively?

To whom are they reported?

Answer The answers are structured in the following manner:

A/ INDICATOR;

B/ How;

C/ When;

D/ Who;

E/ To whom.

A/NUCLEAR SAFETY – VIOLATION OF DEFENCE IN DEPTH (CORE DAMAGE FREQUENCY - DO NOT EXCEED THE WARNING LIMIT FOR THE IMMEDIATE RISK 1E-4/YEAR) [NUMBER OF EXCEEDING];

B/ calculation;

C/ before / during outage;

D/ Nuclear safety department;

E/ head of outage, head of coordination department, plant management meeting.

A/ RADIATION PROTECTION - COLLECTIVE EFFECTIVE DOSE DURING OUTAGE [MSV];

B/ measurement;

C/ during outage;

D/ Radiation protection department;

E/ head of outage, head of coordination department, plant management meeting.

A/ INDUSTRIAL SAFETY – INDUSTRIAL INJURIES DURING OUTAGE [NUMBER];

B/ evidence of industrial injuries + head of outage;

C/ during outage;

D/ Industrial safety and ecology department;

E/ head of outage, head of coordination department, plant management meeting.

A/ READINESS OF OUTAGE [% TOWARDS A DEFINED MILESTONE];

B/ data analysis;

C/ before / after outage;

D/ head of outage;

E/ head of coordination department, plant management meeting.

A/ THE LENGTH OF OUTAGES [DAYS];

B/ measurement;

C/ After outage;

D/ operational economy department;

E/ head of outage, head of coordination department, plant management meeting.

A/ QLV – QUALITY OF HUMAN PERFORMANCE [NUMBER OF EVENTS WITH THE HUMAN FACTOR];

B/ investigation of operational events;

C/ after outage;

D/ NPP safety department + head of outage; head of outage,

E/ head of coordination department, plant management meeting.

Q.No	Article	Ref. in National Report
135	Article 19.7	Subsection 14.1.6

Question/ Comment The Report presents information on the process of operating experience feedback. Do the Operator and Regulator use any criteria/ indicators to evaluate the effectiveness of this activity (operating experience feedback)?

Answer Both operator and regulator use a set of safety performance indicators including indicators for evaluation of the OEF system efficiency. The set of indicators is derived from the IAEA TEC-DOC-1411. In the OEF area, as an example, the following indicators are used:

- Number of events
- Number of safety relevant events
- Number of events classified as INES < 0
- Number of events classified as INES 0 or higher
- Number of events where human factor was a cause
- Number of OLCs violations
- Number of OLCs forced actions
- Number of OLCs entries
- Summary of time when OLC were entered
- Number of temporary changes to OLCs
- Etc.

The licensee has numerical goals defined for each indicator, while the regulator evaluates trends.

The licensees' OEF system efficiency is also checked in the course of SÚJB inspections. Legislative requirements are used as criteria in the course of inspections.