CONVENTION ON NUCLEAR SAFETY

ANSWER TO QUESTIONS POSTED TO CZECH REPUBLIC IN 2008

Q.No *	Country	Article Article 6	Ref. in National Report p. 15-18

Question/ Comment

1) It is stated that “Mission on LBB analyses took place in 1993, 1994 and 1995 at Temelín NPP. All missions concluded that LBB methodology was successfully applied at Temelín NPP in compliance with world practices, and that postulated fractures in deterministic analyses are unlikely to occur”.
Please give more details about the deterministic analyses used and more precisions about the meaning of “unlikely to occur”.

20 It is mentioned that technical improvements were proposed for Temelín NPP based on Western NPP standard. One of them is “Replacement of the nuclear fuel, including a new core design”.
Argentina is interested to know details about the qualification process of the new fuel element. the regulatory criteria used to authorize the replacement of the new fuel and the assessment made and safety acceptance criteria used for the mixed cores.

Answer

1/ The LBB analyses demonstrate that the probability of piping rupture is extremely low (less than 10E-6/reactor years) under the conditions which are consistent with the design basis of the piping as specified. A deterministic evaluation which demonstrates a sufficient margin against failure and which includes verified design and fabrication in addition to an adequate in-service plant inspection plan is assumed to satisfy the extremely low probability criterion.

To assure a safe operation of NPP in the event of impacts induced by pipe rupture of high energy primary circuit piping with a diameter more then 100 mm, the following approaches were used:
1. It was demonstrated that a rupture of the concerned pipe in the defined locations (HP ECCS and Continuous primary purification system) would not prevent a safe reactor shutdown or its maintenance in the safe shutdown conditions (there are 3 divisions of reactor safety protection system, and pipes are in separate places).
2. It was also demonstrated that the pipe rupture probability of successfully evaluated piping systems (main circulated piping, pressurizer surge line, LP ECCS, residual head removal system etc.) is less than 10E-6/reactor years. In the case of a leak, the detection monitoring system will inform operators in time (before the crack reaches the critical value) – fulfillment of LBB criterion.

“Unlikely to occur” means extremely low (less than 10E-6/reactor years).
There are adequate statements from the last report – conclusions (1995):
… The application of the LBB concept to the plant is proceeding. The preparation of the operational instructions has been initiated recently. The role of the LBB concept in the plant safety case has been defined. Monitoring and diagnostic systems are being installed.

2/Westinghouse Electric Corporation (WEC) was contracted to supply the reactor fuel, instrumentation, and control (I&C) in May 1993, at that time the plant was under construction. The first core loading was realized with WEC fuel only, whereas replacement of the original Russian supplier's fuel was accomplished in the core design.
Therefore the Temelín NPP reactor core design consisted of newly designed VVANTAGE 6 fuel provided by Westinghouse Electric Corporation. While the fuel rod and fuel assembly design have a number of differences, the basic design features of the core remain unchanged (the VVER-1000 core has hexagonal geometry). Due to the fact that this was technically very complex (and also basically a prototype) project covering the fuel system and core design, it required the provision of a convincing and complete set of high quality information on the design, manufacturing, future operational behaviour and high safety of the fuel system, core and reactor, with due consideration of the „defence-in depth" against the radioactive fission products release from the fuel. It was WEC's responsibility to provide analysis and evaluations pertinent to the fuel design, instrumentation and control (I&C) design, and design basis accident (DBA) analysis.
The State Office for Nuclear Safety required that the proposed design should comply with the requirements of both Czechoslovak (Czech) legislation and that of the equipment designer and manufacturer country. That meant that in addition to fulfillment of the Czech laws and regulations, the deliverables had to be licensable in the country of origin i.e. to meet the US national codes and standards, especially General Design Criteria established in the U.S. Code of Federal Regulations (10 CFR 50 Appendix A).
In this way the laws and regulations of the Czech Republic and the USA were used as the evaluation basis. The completeness, structure and format of Chapter 4 and 15 SAR were evaluated in accordance with Reg. Guide 1.70. Parts 4 of the safety documentation of NPP South Texas and NPP Sizewell B served to compare American and European standards. The quality of technical data in SAR and the fuel-related Topical Reports were assessed in accordance with the methodological guidance provided by the Standard Review Plan (NUREG-800).

A basic requirement was the demonstration of safety assurance of the fuel system and the core design. The demonstration consisted of fuel compatibility and reliability up to the design discharge burnup. The fuel rod and fuel assembly as well as the the core design bases had to be established and proven to satisfy the general performance and safety criteria presented in Section 4.2, 4.3, 4.4 of the Standard Review Plan.
This had to be demonstrated by submitting complete documentation which included "Supplement to the Safety Analysis Report " (Chapters 4 and 15 were rewritten as a result of the fuel replacement) and by submitting supporting Topical Reports.

The requirements were to prove:

Design compatibility with other components and partstaking into account the existing (original) materials, moderator (water chemistry), especially from the standpoint of:

- thermal hydraulic properties - vibration, hydraulic resistance, CHF correlation, fuel

rod bowing, effect of spacing grids, pressure losses;
- mechanical properties - rigidity, cyclic fatigue, wear, cladding abrasion, deformation by external forces (load during LOCA and seismic events), kinetics of control assemblies drop,
- chemical properties - corrosion, hydriding,
- neutronic-physical properties - peaking factors, influence of different enrichment, water-uranium ratio, etc.; shutdown reactivity margin; stability; maximum speed of the reactivity insertion, both calculated and experimental (especially for the non-active testing area).
Design reliability and safety related influence
had to be demonstrated by proving that:
- fuel design parameters will not be exceeded,
- fuel cooling will be ensured,
- coolability is always maintained
- core design neutronic parameters will be met for normal and abnormal operation and accident conditions (as defined in the Decree No 195/1999 Coll. and/or in 10CF50 App.A,).
All criteria related to fuel rod failure, fuel system damage and control rod insertability and core coolability had to be met.
As part of the the evaluation of NPP safety, the responses to the postulated major operational changes in process parameters as well as the erroneous functions or equipment faults were analysed. Such safety analyses provided a major contribution to the selection of the signal setting limits designed to activate safety systems and were significant for definition of the component and system design specification with respect to health protection and safety of the wide population.
The safety analysis philosophy applied to the Temelin NPP included a bounding approach to the analyses for every initiating event. Thus, not all initiating events were analysed. Where it would be justified that any one of the two initiating events would have less favourable consequences, just this less favourable one in respect of the consequence was analysed. (This approach is acceptable as long as the justification is conclusive enough.)
Admissible analyses were performed only by verified codes (databases, libraries, correlations), accepted for these purposes by the SÚJB based on an evaluation process in the technical experts committees.
Extended program of the physical start-up tests for core with new fuel was implemented,
Inspection and Testing program (including inspections of non-irradiated fuel, inspection of fuel system components and parts, fuel rods and assemblies) had to include a Quality Assurance Program. The requirement was that it should provide control over activities affecting product quality, commencing with design and development and continuing through procurement, materials handling, fabrication, testing and inspection, storage, and transportation.
Fuel and core conditions monitoring and post-irradiation tests had to be specified.
A number of information obtained as a result of SUJB requirements were incorporated into successive revision of Chapter 4 SAR which contributed to improvement of this document quality.

Q.No	Country	Article	Ref. in National Report

1		Article 6	
Question/ Comment	Dukovany NPP was commissioned in the 80’s. Could Czech Republic indicate whether studies on ageing are currently in progress?		
Answer	CEZ is preparing the LTO (Long Term Operation) Programme for the operation of NPP beyond the originally designed lifetime – for 40 to 60 years of operation. Many Ageing Management Programmes are already in place for many important components like reactors, steam-generators, pressurizers, main cooling pumps, primary pipelines, safety systems pipelines, cabelling, concrete etc. Plant Life Management Programme is an important part of LTO Programme and will be introduced during the implementation of this programme. TLAAs (Time Limited Ageing Analysis) were identified and will be recalculated within the LTO Programme.		
Q.No 2	Country	Article Article 6	Ref. in National Report 1.1.2.2, p.13
Question/ Comment	MORAVA "Equipment Renovation Program" elaborated as a set of requirements on modification of Dukovany NPP equipment, ensuring safe, reliable and economical operation. The program is not closed in terms of time and subject, and is updated on an annual basis. Its most important project is the "I&C Renovation" – replacement of safety-important parts for digital systems, which is performed in parts during unit outages. The "I&C Renovation" is implemented on Unit 3 in full and the implementation on other units is distributed as follows: Unit 1 – 2004 to 2007, Unit 2 – 2005 to 2008, Unit 4 – 2006 to 2009. Replacement of electric motor drives of important Completion in 2005; valves Restraints against surging medium and flying objects Completion in 2005; Spent fuel intermediate storage facility extension Completion of the civil part in 2006 (MSVP); Change in the 110 kV reserve power supply Completion in 2005;... Q: Was it necessary to modify the “I&C Renovation” program, taking into consideration the experience from Unit 3? Have you finished all other activities of these programs as described in the Annex1?		
Answer	1) Changes of I&C equipment were carried out by a standard modification programme. The equipment should be identical at all units. 2) The Name of the chapter is: “Changes implemented within the Modernization of Dukovany NPP” – all changes in that list were implemented.		
Q.No 3	Country	Article Article 6	Ref. in National Report pages 14, section 1.1.2.2
Question/ Comment	We understand that use of digital systems in safety important areas has been accepted. Please clarify whether the digital and software based systems are also used in reactor protective systems and safety actuation systems. If so, how the reliability of these systems was calculated and what are the acceptable values.		
Answer	Digital software based systems are used in reactor protection systems and engineered safety features actuation systems at the NPP Temelin as well as in the innovated NPP Dukovany I&C system. The plant-specific reliability requirements of those systems were derived from the		

IAEA recommended value of the calculated core melt frequency of 10E-4/reactor-year and the plant PSA.

Reliability indicators such as the probability of failure per demand and the probability of spurious actuation were calculated using the FMEA and FTA approaches and manufacturers' as well as generic data.

Q.No	Country	Article	Ref. in National Report
4		Article 6	page 15, section 1.1.3.1
Question/ Comment	It is mentioned that LBB methodology was successfully applied at Temelín NPP. Based on this LBB exercise, whether the pipe rupture probability used in PSA was revised for Temelin NPP.		
Answer	No. The LOCA frequencies for Temelin NPP PSA are mostly generic by nature, as there is simply zero occurrences for such large piping diameter and working conditions worldwide. The frequency of occurrence for the LOCA categories used at Temelin and Dukovany NPPs are consistent with the worldwide experience. The Temelin NPP RCS piping is qualified for LBB concept starting from 850 mm diameter down to 100 mm piping. This means that one could use 1E-6 frequency for these diameter breaks for Temelin piping because of piping qualification. On the other hand, there is another residual potential for uncontrolled leaks, breaks or valve failures, which is not directly associated with the LBB qualification. This is also the reason why we do not use the 1E-6 or lower frequency for the Large LOCA (850 mm break) and correspondingly higher frequency for lower break sizes.		

Q.No	Country	Article	Ref. in National Report
5		Article 6	page 17, WENRA/2nd Para
Question/ Comment	It is mentioned that only two safety issues identified by WENRA are unresolved. Please provide details of these two safety issues.		
Answer	The safety issues pointed out by the WENRA Report „ Nuclear Safety in Candidate Countries EU“ as unresolved for the Temelin NPP were issues connected with an assessment proving sufficient protection against high-energy pipe breakage and potential subsequent damage to the steam line and feedwater piping (short-term priority), and informing on measures to complete the proof of reliable function of important steam relief and safety valves at the dynamic load with steam-water mixture flow, meaning the same recommendations as from IAEA and AQG. Both Safety issues were solved, first by special fixing and dumpers, second by the additional qualification of relief valves for the above-mentioned conditions. These safety issues are gradually being solved on all VVER 1000 units in the world. Actual status of the solution of these issues related to Temelin NPP is: 1) The high-energy pipe break protection is based on the combination of an extremely low likelihood of a sudden break of the pipeline under normal or abnormal operation conditions or in seismic event, and the application of the French "super pipe" concept (that precludes sudden pipe breakage for the area from containment penetration to anchoring point), 100 % qualified ultrasonic inspections, a corrosion-erosion monitoring program, etc. Whip restraints are installed at certain points in accordance with recognized internationally-accepted standards. Computer programs used for assessment are validated in the full scope of parameters . 2) The reliable function of important steam relief and safety valves for the occurrence of two-phase steam-water medium, i.e. qualification of respective		

valves, was demonstrated, in accordance with international standards, by the extrapolation of a qualification set of knowledge. The principle of the qualification is based on the assignment of the valve under review to the group of valves of the same manufacturer and with comparable characteristics that were tested for the full scope of required parameters.

Q.No 6	Country	Article Article 6	Ref. in National Report Section 1.1.2.1, Page 13
Question/ Comment	It is stated that “internal and external audit were held at Dukovany NPP in 1993-1995” . Why was the internal and external audit not carried out at Temelín NPP?		
Answer	There were many other reviews and evaluations with different names at Temelin NPP during construction as well as when it was put into operation. We believe that CEZ has received many similar supporting ideas on how to improve safety, similar to the internal and external audit in Dukovany.		

Q.No 7	Country	Article Article 6	Ref. in National Report 1.1.2 Dukovany NPP
Question/ Comment	Dukovany NPP belongs to WWER - 440/213 plants which were defined by the EU WENRA as upgradable to modern safety standards. There has been a large program of upgrading already realised. What are the tasks still left to be performed to complete Dukovany safety upgrading? Indications on this should be found in Annex II and Annex IV, but the comparison of these two annexes show that the data are not always transparent. For example, annex II indicates that the safety issues which are being solved (under implementation) include primary pipe whip restraints, Reactor Coolant pump seal cooling system, Essential water service system etc., while the program of upgrading till 2010 “MORAVA “ presented in Annex IV does not mention these tasks or indicates that they were completed in 2005 or 2006.		
Answer	Modernisation is an ongoing process. Discrepancies have several aspects and a simple explanation: - The equipment renewal program (annex IV) was approved in 1998 and is not driven by the Safety Issues. - Consequential corrective solutions for Safety issues have been submitted since 2002 and are not included in the above mentioned program. (The aim of Dukovany NPP was never to merge both Annexes.) - A larger set of Safety Issues is resolved within I&C system renovation and equipment qualification. - Modification titles are not usually identical with Safety issue titles. Safety Issues which have not yet been resolved can be found in Annex II, whereas completion dates for the tasks defined in the Equipment renewal program can be found in Annex IV.		

Q.No 8	Country	Article Article 6	Ref. in National Report 1.1.3 Temelín NPP
Question/ Comment	The review of Annex II in respect of Temelin shows that nearly all IAEA safety issues for that plant have been resolved, the only exception being qualification of equipment which is still under way. However, the IAEA safety issues for WWER 1000 NPPs do not cover all items important to safety according to the actual state of the art.		

Under Melk agreement with Austria 10 key safety areas were identified as areas of joint safety review. Which of these areas have been successfully closed? When are the remaining areas expected to be closed?

Answer

There are 7 (resp. 8) areas under the Melk agreement as follows:
- High Energy Pipe Lines at the 28.8 m Level
- Qualification of Valves (steam safety and relief valves)
- Reactor Pressure Vessel Integrity and Pressurized Thermal Shock
- Integrity of Primary Loop Components - Non-destructive Testing
- Qualification of Safety Classified Components
- Site Seismicity
- Severe Accident Related Issues (split into 2 sub-areas):
- Radiological Consequences of BDBA
- SAMG

There is still a need for information from Austrian experts regarding the area of High Energy Pipe Lines at the 28.8 m Level. The information is to be provided under Czech-Austrian Bilateral Agreement. Other areas are closed.

Q.No	Country	Article	Ref. in National Report
9		Article 6	

Question/ Comment

In the area of Temelin upgrading to mitigate severe accidents some measures have been planned but no information about their final completion has been available. They concern
• Upgrading of hydrogen recombiners, whose capacity was to be increased to handle severe accident hydrogen releases, .
• Measures for enlargement of the molten core area under the reactor pressure vessel so as to facilitate corium cooling in case of melt-through by corium.

What is the status of implementation of these upgrading measures in Temelin to mitigate severe accidents ?

Answer

UPGRADING OF HYDROGEN RECOMBINERS:
In 2007, the project for evaluation of hydrogen concern in Temelin containment during severe accidents was finished and the following has been performed:
• Methodology for the evaluation of hydrogen concern during deflagration-to-detonation transition
• Detail containment model and containment nodalization for MELCOR 1.8.5 code
• Detail hydrogen distribution analyses of selected scenarios (scenarios selected based on deterministic and probabilistic evaluation)
• Based on performed calculations, conditions for deflagration-to-detonation transition could occur only after reactor vessel failure during MCCI (ex-vessel phase of severe accident)
• Based on preliminary design, hydrogen detonation during severe accidents could be ultimately prevented using an additional set of passive catalytic recombiners with sufficient capability (several times greater than for design bases accidents) – Steps for future plant upgrading through controlled design modification process have already been initiated.

MEASURES FOR THE ENLARGEMENT OF THE MOLTEN CORE AREA UNDER THE REACTOR PRESSURE VESSEL:
The Temelin accident management programme is built based on the robust VVER1000 design and on the complete package of symptom oriented EOPs and

SAMG. Even though this approach is sufficient for most existing PWRs, the Temelin design resistance against severe accident phenomena is increasing. The main focus is oriented towards MCCI moderation with the aim to prevent a containment basement melt-through. The main design modification are the following:

• Plugging of ionization chambers channels through the containment basement (Unit 1 – completed during outage in 2007, Unit 2 – scheduled for outage in 2008)
• Enlargement of area for molten core spread after reactor vessel failure (opening the doors between reactor cavity and corridor and installation of removable barriers to localize corium)
(Design modification preparation in progress)
• Increasing the coolant inventory inside containment for corium cooling
(Design modification is in progress, scheduled for outages 2009 – 2010).

Q.No 10	Country	Article Article 6	Ref. in National Report

Question/ Comment	When describing the status of existing nuclear installations major emphasis in the Report is placed on reviews conducted by various international organizations, on conformance to different international standards and regulations. This is of course very important and valuable. Nevertheless, the major responsibility is borne by the national organizations: operating organization and regulatory body. Therefore, the determinant evaluation should be that performed by the above national organizations in respect of the national regulatory provisions and, of course with due account of international practice, standards and missions. As regards Dukovany NPP, such assessments are available, but concerning Temelin NPP there is practically no information on this matter. Remark: It would be desirable to provide such assessments for Temelin NPP.
Answer	Regular safety evaluation is performed by national organizations with respect to the national regulatory provisions and, of course, with due account of international practice, standards and missions. Both NPPs (Temelin and Dukovany) are operated with no compromises of national legislation. Respect of the best international practises is included in planned modifications which are in a competitive environment under the trade secrets protocol. The permanent assessment of Czech NPPs is performed by the Czech regulatory body (SUJB) via regular inspections. Dukovany NPP concluded a Periodic Safety Review in line with the IAEA guide NS-G-2.10 in 2007. Temelin NPP will begin the same process in 2008 with the aim to finish it in 2009. Corrective Action Plans follow such comprehensive safety assessments.

Q.No 11	Country	Article Article 6	Ref. in National Report 6 and 7

Question/ Comment	Please explain the composition of the state examining board. Does the state examining board develop the examinations (written, oral, and practical)? Does the state examining board administer the exams, observe administration carried out by another party, or just review results? Is the personnel authorization (2 to 8 years) based on the candidate’s exam score, number of times recertified, or some other method?
Answer	1/ The Chairperson of the SÚJB State Examination Body, set apart to verify the special professional skills of nuclear installations’ selected personnel members

(Shift Supervisor, Safety Supervisor, Unit Supervisor, MCR Supervisor, Reactor and Turbine Operator, Fuel and MCR Physicist) issues its statute thus:
The mission of the State Examination Body is to verify the professional skills of the nuclear installations' selected personnel members in compliance with the special law regulation, using an examination in the presence of this Body (hereinafter as "Examination" only).
The Chairperson of the State Examination Body, who must be also a SÚJB Inspector, can be appointed or recalled by the Chairperson of SÚJB.
The State Examination Body's deputy chairperson, secretary, and members may be appointed or recalled by the Chairperson of SÚJB, as proposed by the Chairperson of SÚJB.
The nomination of a State Examining Body Member is based on his job position in the nuclear branch, mostly NPPs experts.

2/ SÚJB provides periodical (usually once per year) revision of questionnaire files.

3/ The Regulatory Body (SÚJB) shall issue authorizations and establish a State examination Body for the verification of special professional competence and shall issue statute for this commission and specify activities directly affecting nuclear safety.
The Chairman of the SÚJB State Examination Body is set apart to verify the particular professional skills of the nuclear installations' selected personnel members (Shift Supervisor, Safety Supervisor, Unit Supervisor, MCR Supervisor, Reactor and Turbine Operator, Fuel and MCR Physicist).

The mission of the State Examination Body is to verify the professional skills of the nuclear installations' selected personnel members in compliance with the special legal regulation, using an examination in the presence of this Body.

4/ Authorization to activities of selected workers of nuclear installations shall be granted by the Regulatory Body based on an application submitted by the licensee and based on the fulfillment of qualification requirements and verification of professional competence through an exam before a State Examining Commission, for REACTOR OPERATOR and TURBINE OPERATOR for a period of 2 to 4 years, and for SHIFT SUPERVISOR, SAFETY SUPERVISOR, UNIT SUPERVISOR, CR SUPERVISOR and PHYSICISTS for a period of 2 to 8 years.

The overall evaluation of the examination is the responsibility of the Chairman of the State Examination Body.

All in all, the grade "passed" is assigned to the examination when its oral part has been graded within a range from 1 to 3 and when other its mandatory parts have been graded as "passed".

Should the authorization be awarded for the first time, its term is 2 years long.
Should the authorization be awarded on a repeated basis, each time covering the same activities, the State Examination Body, with the evaluation results from the oral part of the examination at hand and on the basis of faultless performance (work results) in this field of activities and of the recommendations of the license holder, can recommend that the authorization for REACTOR OPERATOR and TURBINE

OPERATOR should be awarded for a duration of up to four years.

Should the authorization be awarded on a repeated basis, each time covering the same activities, the State Examination Body, with the evaluation results from the oral part of the examination at hand and on the basis of faultless performance (work results) in this field of activities and of the recommendations of the license holder, can recommend that the authorization for SHIFT SUPERVISOR, SAFETY SUPERVISOR, UNIT SUPERVISOR, CR SUPERVISOR and PHYSICISTS should be awarded for a duration of up to eight years in the following sequence:
Authorization to be awarded repeatedly for the first time: 4 years,
Authorization to be awarded repeatedly for the second time: 6 years,
Authorization to be awarded repeatedly for the third and more time: 8 years,
The secretary of the State Examination Body shall write in the Examination Record that the authorization has been awarded. The Record shall be confirmed by the Chairman of the State Examination Body.

In compliance with the Atomic Act and with the Administrative Code, the Regulatory Body (SÚJB) shall issue the decision to award the authorization.

Q.No 12	Country	Article Article 7.1	Ref. in National Report
Question/ Comment	Elements of the Czech Republic's report discuss indicators that are used to assess the safety of nuclear installations that are regulated by the SÚJB. Australia is keen to learn of the indicators that the SÚJB might use to measure the effectiveness and performance of its nuclear safety regulatory framework. For example, we have an interest in indicators used to measure: - the effectiveness of outcomes and processes; - efficiency of processes in terms of timeliness, cost and resource utilisation; - effectiveness of enforcement and compliance activities; and - stakeholder satisfaction.		
Answer	SÚJB has no set of indicators dealing with the effectiveness and performance of the State Office.		

Q.No 13	Country	Article Article 7.1	Ref. in National Report
Question/ Comment	With regard to the issue of transparency in nuclear safety regulatory decision making, Australia would be grateful for any information that the Czech Republic could provide on the processes it has in place to achieve transparency of the decision making process, for both licensees and members of the public.		
Answer	The Czech Republic signed the Aarhus Convention (Aarhus Convention on the Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters) which came into effect for the Czech Republic in November 4, 2004. This area is regulated on the national level by Act. No. 123/1998 Coll, on Access to Information on the Environment and Act No. 106/1999 Coll., on Free Access to Information". This regulation allows any natural or legal person to access information held by State authorities, communal bodies and private institutions managing public funds.		

Requests can be made in writing or orally. The public bodies are required to respond to requests within 15 days.

There are exemptions for classified information, privacy, trade secrets, internal processes of a government body, information collected for a decision that has not yet been made, intellectual property, criminal investigations, activities of the courts, and activities of the intelligence services.

Act No. 100/2001 Coll. on Environmental Impact Assessment.
The subject of the environmental impact assessment pursuant to this Act shall be the site of a nuclear installation or radioactive waste repository, construction of a nuclear installation, particular stages of decommissioning of a nuclear installation (including changes which capacity or extent is to be increased by 25 percent or more, or if there is a significant change in the technology, management of operations or manner of use). This Act provides procedure for Preliminary public hearing and Public hearing.

According to the Atomic Act, SUJB is obliged to give out information according to special legal provisions and once a year to publish a report on its activities and submit it to the Government and to the public.

Licensees (based on the Atomic Act) are obligated to provide the public with information on the maintenance of nuclear safety and radiation protection which is not subject to State, professional or commercial secrecy. The Civil Safety Commission could be mentioned in this context, made up of qualified and trained mayors, representatives and citizens of local municipalities, who receive regular daily reports of Dukovany NPP and who are authorized to independently inspect the nuclear power plants and inform the general public.

Q.No	Country	Article	Ref. in National Report
14		Article 7.2.1	Section 2.1.1, Page 20

Question/ Comment	Is there any process according to which public opinion is included in the regulatory process?
Answer	The Czech Republic signed the Aarhus Convention (Aarhus Convention on the Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters) which came into effect for the Czech Republic in November 4, 2004. This area is regulated on the national level by Act. No. 123/1998 Coll, on Access to Information on the Environment and Act No. 106/1999 Coll., on Free Access to Information". This regulation allows any natural or legal person to access information held by State authorities, communal bodies and private institutions managing public funds. Requests can be made in writing or orally. The public bodies are required to respond to requests within 15 days. There are exemptions for classified information, privacy, business secrets, internal processes of a government body, information collected for a decision that has not yet been made, intellectual property, criminal investigations, activities of the courts,

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Q.No 15	Country	Article Article 7.2.2	Ref. in National Report

Question/ Comment: According to the information presented in the Report, the issuing of NPP construction permits and operation licenses as well as for other kinds of activities in the area of nuclear power is performed by the Ministry of Industry and Trade with involvement of:
- technical inspection bodies engaged in safety assurance in the industry including the safety of pressurized components and electrical systems;
- regional and municipal authorities - as regards fire safety, waste management, water consumption and releases;
- Czech Inspectorate for Environmental Protection - as regards air pollution;
- local authorities responsible for the protection of public health - in relation to labor protection.
At the same time, the Atomic Act establishes the activities, for which SÚJB's license is required. Besides major activities such as siting, construction and operation SÚJB's license is needed also for other kinds of activities, e.g. license for certain steps of nuclear installation commissioning works, license for upgrading or for other modifications affecting safety, radionuclide release into environment etc.

1) How do these licenses issued by different state and local bodies for the same activity go together (match)? 2) Couldn't this complexity of the legislative system weaken the role of the regulatory body?

Answer: For any proceeding corresponding to an activity which is regulated (siting, construction permit, etc) there is a body set by law (a “prime” authority) which issues the permit or license. An application for a license (permit) must be supported by a set of permits or licenses (also given by law) which corresponds to individual

aspects of the activity (e.g. environmental, fire, hydrologic etc.) issued by corresponding authorities. The prime authority should respect the opinion of the authorities considering the application from different aspects and based on whether it finally decides on the application.

This system allows for more effective performance of the administrative proceedings in the concerned technically complex field. This does not weaken the role of the regulatory body; the decision is actually stronger (i.e. better supported) because it is based on competent considerations of specialized authorities. E.g. in some such proceeding when SUJB is not the prime authority its opinion cannot be, in the final decision, overruled. Separation of the specific fields of administration enables a higher level of specialization, a higher technical skill of the bodies, independence of decision making process and consequently an empowerment of the executive position of a concerned body. Powers and competencies of all regulatory bodies are defined in corresponding acts and they do not overlap. This system is endowed with legislative brakes which prevent the abuse of power.

Q.No 16	Country	Article Article 7.2.2	Ref. in National Report

Question/ Comment: Permits for certain steps of nuclear installation commissioning activities and other similar works are also named in the Report as licenses.
Does this mean that the procedure for obtaining these permits is the same as that for major licenses - licenses for construction and operation? If not, then some clarification in terminology is needed here for permissions of different levels.

Answer: The Atomic Act states in Section 9:
(1) A licence issued by the Office is required for:
a) sitting of a nuclear installation or a workplace with very significant ionising radiation source;
b) construction of a nuclear installation or a workplace with very significant ionising radiation source;
c) particular stages, laid down in an implementing regulation, of nuclear installation commissioning;
d) operation of a nuclear installation or a workplace with significant or very significant ionising radiation source;
e) restart of a nuclear reactor to criticality following a fuel reload; and others.

All these licensees are issued after SUJB review and assessment of all the submitted documents which scope is defined by Appendix to this Act.
A. Documentation for the issue of a licence for siting of a nuclear installation or workplace with very significant ionising radiation source
I. Initial safety report, the content of which shall include
1. description and evidence of suitability of the selected site from the aspect of siting criteria for nuclear installations and very significant ionising radiation sources as established in a legal implementing regulation;
2. description and preliminary assessment of design conception from the aspect of requirements laid down in an implementing regulation for nuclear safety, radiation protection and emergency preparedness;
3. preliminary assessment of impact of operation of proposed installation on personnel, the public and the environment;
4. proposal of conception for safe termination of operation;

5. assessment of quality assurance in process of selection of site, method of quality assurance for preparatory stage of construction and quality assurance principles for linking stages.
II. Analysis of needs and possibilities of physical protection assurance.

B. Documentation for the issue of a licence for construction of a nuclear installation or workplace with very significant or significant ionising radiation source
I. Preliminary safety report, which shall include
1. evidence that the proposed design meets all requirements for nuclear safety, radiation protection and emergency preparedness as laid down in an implementing regulations;
2. safety analyses and analyses of the potential unauthorised handling of nuclear materials and ionising radiation sources, and an assessment of their consequences for personnel, public and environment;
3. information on predicted lifetime of nuclear installation or very significant ionising radiation source;
4. assessment of nuclear waste generation and management of it during commissioning and operation of the installation or workplace being licensed;
5. conception of safe termination of operation and decommissioning of the installation or workplace being licensed, including disposal of nuclear waste;
6. conception for spent nuclear fuel management;
7. assessment of quality assurance during preparation for construction, method of quality assurance for the carrying out of construction work and principles of quality assurance for linking stages;
8. list of classified equipment.

II. Proposed method of providing physical protection.
The documentation specified under I.8 and II shall be subject to approval by the Office.

C. Documentation for the issue of a licence for individual stages of nuclear installation commissioning
a) For stages prior to loading nuclear fuel into a reactor
1. time schedule for work in a given stage;
2. programme for the stage in question;
3. evidence that installation and personnel are prepared for the stage in question;
4. evaluation of results of the preceding stage;
5. method by which physical protection is to be provided.
b) For the first loading of nuclear fuel into a reactor
I. pre-operational safety report which shall include
1. description of changes to original design assessed in the preliminary safety report and evidence that there has been no decrease in the level of nuclear safety of the nuclear installation;
2. supplementary and more precise evidence of nuclear safety and radiation protection provisions;
3. limits and conditions for safe operation of the nuclear installation;
4. neutron-physics characteristics of the nuclear reactor;
5. method of radioactive waste management;
6. quality evaluation of classified equipment;
II. further documentation which shall include

1. evidence that all prior decisions and conditions of the Office were fulfilled;
2. time schedule for nuclear fuel loading;
3. programme for nuclear fuel loading;
4. evidence that installation and personnel are prepared for nuclear fuel loading;
5. evaluation of the result of previous stages;
6. on-site emergency plan;
7. changes in the provision of physical protection;
8. programme of operational inspections;
9. proposed decommissioning method;
10. cost estimate for decommissioning as in II.9, verified by the Authority.

c) For stages following the first nuclear fuel loading into the reactor

1. time schedule for work in this stage;
2. programme of this stage;
3. evidence that installation and personnel are prepared for the stage in question;
4. evaluation of results of the previous stage.

Documentation as specified under a), items 2 and 5, under b), items I.3, II.6 to II.9 and under c), items 2 shall be subject to approval by the Office. The Office may open proceedings even if documentation as in II.4 is not submitted.

D. Documentation for the issue of a licence for nuclear installation or workplace with significant or very significant ionising radiation source operation

a) For the issue of a licence for nuclear installation operation

1. supplements to the pre-operational safety report and further supplements to documentation required for the issue of a licence for the first nuclear fuel loading into the reactor, relating to changes carried out after the first nuclear fuel loading;
2. evaluation of results of previous commissioning stages;
3. evidence of implementation of previous decisions and conditions of the Office;
4. evidence that installation and personnel are prepared for operation;
5. operation time schedule;
6. up-dated limits and conditions for safe operation.

b) For the issue of a licence for workplace with significant or very significant ionising radiation sources operation

1. evidence that construction was carried out in accordance with the construction licence as regards radiation protection;
2. certificate on completion of construction and installation activities;
3. evidence of the effectiveness of shielding, insulation and protective equipment;
4. conception for safe disposal of possible radioactive waste generated during operation of workplace with ionising radiation sources;
5. proposed method of decommissioning;
6. on-site emergency plan;
7. cost estimate for decommissioning, subject to item b) 5, verified by the Authority.

Documentation as specified under a), item 6 and under b), items 5 and 6 shall be subject to approval by the Office. The Office may open proceedings even if documentation as in a), item 4 is not submitted.

E. Documentation for the issue of a licence for restart of a nuclear reactor to criticality following a nuclear fuel reload

1. neutron-physics characteristics of the reactor;
2. evidence that installation and personnel are prepared for restart of the nuclear reactor to criticality, including preliminary evaluation of in-service inspections;

3. time schedule for subsequent operation.
The Office may open proceedings even if documentation under item 2 is not submitted.

The review should be finished in different time periods from commencement of licence proceedings for a particular practice to issue, which are defined in Section 14 of the Atomic Act:
a) four months, in the case of a licence for siting of a nuclear installation or very significant ionising radiation source;
b) one year, in the case of a licence for construction of a nuclear installation or very significant ionising radiation source;
c) six months, in the case of a licence for the first fuel load into a reactor, under Section 9 (1) c), and 10 days in the case of other stages of commissioning;
d) 24 hours, in the case of a licence under Section 9, par. 1, ad e); the procedure for submission and assessment of required documentation shall be laid down in an implementing regulation;
e) 60 days in the case of other licences for particular practices.

Q.No *	Country	Article Article 8.1	Ref. in National Report P. 26 – 32
Question/ Comment	Could Czech give more details about the inspection program, whether is it based on the risk and the qualification and training of inspectors?.		
Answer	The inspection programme is not based on the risk, there are Regulatory Internal Instructions on which the program is based. The Inspector, as the Atomic Act states, must be the only person qualified to perform legal acts, university graduates in a relevant field and have three years of professional experience. An inspector shall be professionally qualified in matters under his supervision, shall be a person of probity and competent in respect to security under a specific legal regulation in case of performing sensitive activities under a specific legal regulation. The inspector is appointed by the Chairperson of the SÚJB after succesfully passing an exam. Training of Inspectors is provided by the SUJB Inspector’s training programme.		

Q.No 17	Country	Article Article 8.1	Ref. in National Report 3.1
Question/ Comment	The report does not give a clear picture on how human resources are dived within the different units and sections. Some more details on that would be appreciated		
Answer	SUJB has a total 197 employees. In accordance with the SUJB Organizational Chart there are 3 main departments: • Department for management and technical support – • Department for Nuclear Safety • Department for Radiation Protection The Department for management and technical support is comprised of 55 employees and other than economic, international, legal sections, Office Bureau (personnel, housekeeping agendas) it is also comprised of safeguards and non proliferation sections (nuclear, chemical and biological weapons);		

The Department for Nuclear Safety has 54 employees, 2 positions are momentarily vacant. Its duties cover inspection of nuclear facilities, nuclear safety assessment and waste and spent fuel management.

Department for Radiation Protection (75 employees) deals with all problems of radiation protection (including at NPPs).

In addition to the three main departments there are units reporting directly to the chair: the Emergency Response Centre, unit of European Matters, Internal Audit and individually appointed advisors; in total 13 persons.

The selection of the new employee is organized (selection process, approval and negotiation of employment contract) by the Office Bureau on the basis of requirements of individual departments. A three-month trial period in the contract is a rule.

The above organisation chart together with number of persons in each department is approved by SUJB top management for each calendar year.

Q.No	Country	Article	Ref. in National Report
18		Article 8.1	3.1

Question/ Comment: The report does not give any information on initial qualification of the different staff members, their training and re-training programmes. Although a similar question had been extensively answered during the 2005 meeting, it would be useful to include this in the report.

Answer: The principles of SUJB employee training are defined in the individual provisions of the Atomic Act (No. 18/1997 Coll. on Peaceful Uses of Nuclear Energy and Ionizing Radiation). The provisions are specified in an internal SUJB directive. Secondary school education as initial qualification is acceptable for many positions of a more administrative work character . However, the initial qualification for inspectors (nuclear safety, radiation protection non-proliferation) inspectors and managerial positions is a university degree education.

SUJB personnel are systematically trained. It is governed by an “Individual Plan of Improving Professional Capability” agreed upon by the employee and his superior, and consists of individual training modules. The training has a continuous character and combines general and specialized training.

The training is carried out as lectures, seminars, special courses (home and abroad), self-education, consultations, exercises, etc. Services of the Czech Power Company Training Centre and its training programmes (or only parts of it) are used for specialized training. Among others, it includes training at full-scope simulators for SUJB resident nuclear safety inspectors.

Training of the SUJB personnel is organized by the Office Bureau which also provides relevant professional support in training. In particular, experienced staff members of the SUJB personnel are obliged to contribute to the courses of training by lecturing, providing consultations, etc.

Q.No	Country	Article	Ref. in National Report

19		Article 8.1	
Question/ Comment	Do you have currently in your regulatory staff, or in a technical support organization (TSO) working for the regulatory body, an adequate number of technical experts (e.g., in the areas of reac-tor physics, thermo-hydraulics, and materials engineering) who can conduct an in-depth safety assessment of nuclear power plant, as would be needed for evaluation of operating events, large power upgrade, lifetime extension, or new build? Do these experts have tools and ability to conduct independent safety analysis, including both deterministic analysis and PRA? What is the number of such experts in various technical areas within the regulatory body and within the TSO? What is the outlook concerning the number of experts in a few years ahead?		
Answer	The State Office for Nuclear Safety (SUJB) has currently (for example) 2-3 experts for reactor physics reactor physics, 2 experts for thermo hydraulics, 3 experts for PSA and risk informed approach, 5 experts for I&C design and 5 experts for material and structural engineering on positions of regulatory inspectors for in-depth assessment of licensing and safety documentation and inspections on site in these areas. Additionally, technical support is contracted when necessary from the TSO or other specialised external organisations. A specific approach is realised for the field of licensing thermo hydraulic analyses, where a specific TSO team of three persons, occupied only by analyses assessment and by independent analysis, is continually contracted by SUJB. This practise has been used continuously over the decades and the plan is to satisfy it as well for the future in cooperation with technical universities.		
Q.No 20	Country	Article Article 8.1	Ref. in National Report
Question/ Comment	What kind of systematic training and development programmes you have for your new regulatory staff members? How do you ensure that they are ready to conduct their duties as regulatory staff members in the tasks assigned to them?		
Answer	For new employees, an Individual Plan for Improvement of Professional Capability is prepared for a trial period (usually 3 months). It contains courses about SUJB general information, its mission, competence, organizational chart. It also covers basic acts and regulations which regulate the SUJB activities, for instance internal procedures, organizational rules and regulations, archiving the document system, the SUJB Chair orders, questions on confidentiality, internal information flow including utilisation of the SUJB computer network, etc. Another purpose of the entrance training is to orient a newcomer at his/her concrete workplace at the SUJB (including all formal requisites), to start-up the professional orientation (inspector, expert, specialist, etc.), and to assess the new employee abilities for continued work for the SUJB. This 3 month Individual Plan is evaluated by the Office Bureau not later than 3 days before the trial time is over. This evaluation, which serves as a basis for the decision on continuation, is carried out by the employee’s direct superior in the presence of the employee, head of the relevant department and representative of the Office Bureau (dealing with agenda of training). If the evaluation is positive, the employee is included into the further training procedure i.e. a Standard Individual Plan for the period of next 3 years is approved.		

Differentiation in individual personal training established in the Individual Plan is based on their level of education (university, post-graduate, secondary professional school, etc.), previous practice, and experience and their professional specialisation. The Individual Plan is also elaborated with respect to the SUJB strategy and needs, abilities and expertise of each employee, as well as to his/her personal preferences. For any permanent employee an Individual Plan is prepared for the 3 year period, however its evaluation and observance is performed annually by the employee's direct superior .

If the employee is assumed to become an inspector, the Individual Plan also contains training focused to inspector examination and an obligation to pass it. Therefore a tutor who guarantees the fulfillment of requirements and shares responsibility for achieving a required professional competence is appointed for a newcomer by the head of the respective department. Inspector examination is, as a rule, planned approximately within a year after joining the SUJB.

Inspector examinations are carried out by a commission composed of SUJB Chair and directors of relevant departments, the tutor, a representative of Office Bureau and other specially invited SUJB inspectors.

In case of failure, the inspector examination can be repeated twice, as a maximum, within the periods set by the examining commission. If the employee repeatedly fails the examination, the further procedure is regulated by the Labor Act (cancellation of the contract as maximum punishment).

Q.No 21	Country	Article Article 8.1	Ref. in National Report p. 31, §3.1.4
Question/ Comment	The report states that "the SUJB also acts as managing authority of the National Radiation Protection Institute (SURO), an organization unit of the State providing expert and technical support in the area of radiation protection". Could Czech Republic clarify the position of SURO vis a vis SUJB. In particular, is SURO's budget controlled and managed by SUJB?		
Answer	The National Radiation Protection Institute (SURO) is a technical support organization of the SUJB established by the SUJB. Its director is appointed by the SUJB chair but he/she appoints its deputies. Otherwise the SURO behaves as an individual legal entity (governed by e.g. Labor Act, Accounting rules etc.). The budget is to be approved by SUJB. For a given budget, SURO manages its funds independently within the framework of rules given by law on public money spending. SURO carries out expert support duties for SUJB as well as research activities in different fields of radiation protection. Among others, SURO runs the Czech national early warning monitoring network.		

Q.No 22	Country	Article Article 8.1	Ref. in National Report page 31
Question/ Comment	Does the state regulatory body SUJB have an integrated management system complying with GS-R-3? If yes, is it intended to certify this QM-System with international standard?		
Answer	The management system of SUJB is based on a hierarchical structure of internal		

documents which satisfies requirements laid down by IAEA GS-R-3. The core is:

•Rules of Organization. This determines the organizational structure and basic division of responsibilities and competences. The mission, tasks, basic working methods are also laidout here.

The basic procedures for the work are set by:
• Internal SUJB Directives (e.g. Directive Setting up Roles and Responsibilities In the Process of Approval of SAR) and
• Methodological Instruction (e.g. Methodological Instruction for Activities in Case of Loss, Finding or Capture of Radioactive Materials).

• Decrees of the Chairperson. Roles define responsibilities in temporary tasks.

Thus the internal documentation forms a system ensuring that the activities described in this documentation are planned, managed, carried out and evaluated by competent persons (management, nuclear safety inspectors etc) and accompanied by appropriate documentation.

Operational management is carried out by periodical meetings of the management. The tasks are set and their fulfillment is monitored and checked there. All these activities are accompanied by a proper documentation.
All SUJB tasks can be continuously monitored and checked by management on all levels using electronic database systems like:

• Basic database system for registration, circulation and issuance of all SUJB documents (both internal and external)
• Database of licenses and decisions made by SUJB
• Database of control activities and their results

SUJB is by law authorized to set up and keep specialized databases:
• Database of radioactive sources
• Database of professional exposures
• Database of subject with permission to handle radioactive sources.

The SUJB management system is not certified.

Q.No	Country	Article	Ref. in National Report
23		Article 8.1	3.1.1., p. 28

Question/ Comment

In 2005, the competence of the SÚJB has been extended pursuant to amendment of the Atomic Act by including the competence of the surveillance of technical safety of special-designed systems, structures and components for nuclear installation (see letter w) and x) above). Special-designed, systems, structures and components for nuclear installations may be used on their assessment by legal person entrusted for this purpose by procedure according to special legal regulation.
w) shall establish technical requirements to assure technical safety of selected systems, structures and components;
x) upon agreement with the administration office, shall inspect the activity of the authorised persons;
Q: Why was it necessary to extend the competence of SUJB? What type of regulatory tasks were transferred to the nuclear regulatory body?

Answer	The state-governed regulatory organization subordinate to the Ministry of Labour and Social Affairs was responsible for the surveillance of technical safety during manufacture as well as operation of the selected installations until 2005. Since technical and nuclear safety are closely related to each other, the authority of this organization overlapped in a large extent with competence of the SÚJB. Therefore, the authority of the SÚJB was extended by the performance of the state-governed surveillance of technical safety. Inspection and evaluation activity is controlled from one centre; it is more effective, complex and operative. The surveillance of technical safety during manufacture as well as operation of the selected installations was transferred to SÚJB. In general, the role of SÚJB in the area of evaluation and inspection activity is the same as in technical and nuclear safety, provided that inspection within the framework of technical safety is also focused on the activity of authorized persons during manufacture of the selected, special-designed installations.

Q.No	Country	Article	Ref. in National Report
24		Article 8.1	page 31

Question/ Comment	In the last paragraph of section 3.1.4 it is stated that SUJB has used support from advisory groups of independent experts. Are these independent experts belonging to the SURO or the SUJCHBO? Could you please provide examples of nuclear safety and radiation protection issues for which support from such advisory groups was needed?
Answer	Requirements for the establishment of Advisory Committees to the SÚJB (Czech regulatory body) are not expressed in the current Czech nuclear legislation. In compliance with the IAEA recommendations and international regulatory practice two Advisory Committees were established by the chairperson of SÚJB in 1998: - Advisory Committee for Nuclear Safety - Advisory Committee for Radiation Protection Both ACs have their own statute which stipulates the basic rules of their operation. In principle, ACs discuss current or future issues associated with radiation protection and its application in various areas as well as issues associated with the implementation of a nuclear power program in the Czech republic. The topic of the ACs meetings are proposed either by SÚJB chairperson or by the ACs. On the basis of discussion AC have been preparing the recommendations for the SÚJB chairperson. The written record from each meeting is submitted to the SÚJB chairperson. Members of ACs are, as a rule, distinguished and independent experts from universities, research organisations, private organisation, foreign regulatory bodies etc. If required, other experts may be invited to AC meetings. The chairperson of SÚJB appoints the chairperson of ACs. A group consists from 10- 12 members who are appointed for the term of 3 years. AC meets as a rule 1- 2 times a year. Meetings of the AC are convened by AC chairperson with support of SÚJB.

Q.No	Country	Article	Ref. in National Report
25		Article 8.1	P. 30

Question/ Comment	As you reported the SUJB is authorised , among other provisional measures, »….. to suspend an installation of components or systems of nuclear installations:« As we find the authorisation of SUJB to reduce the power or to suspend operation of NPP as understandable and obvious, we would appreciate if you could provide us with some concrete examples of what is meant by last mentioned provisional measure?
Answer	Since the Atomic Act No. 18/1997 Coll. has been fully applied, SÚJB has not legally issued a provisional measure to reduce power output or suspend operation of the nuclear installation. To suspend means to stop or interrupt operation or the course of works. Examples are: the order to stop montage of inaccurate components or an incorrectly used method, to shut down the reactor, or to break the restart to criticality. Any violations of nuclear and radiation safety that occurred were solved by management negotiations that resulted in corrective measures adopted by the utility to assure the required safety level.

Q.No	Country	Article	Ref. in National Report
26		Article 8.1	Para 8, page 52

Question/ Comment	Are national or international certification authorities involved in NPP certification?
Answer	Yes, for example DNV certification is used by EMS (ISO 14001 certification), but usually the firm has the branch office in CR.

Q.No	Country	Article	Ref. in National Report
27		Article 8.1	Section 3.1.2

Question/ Comment	The report states that SUJB can enter facilities where activities related to nuclear energy utilisation are carried out. Does this enable SUJB to carry out inspections at utilities' headquarters and offices not on the licensed sites, to carry out inspections at equipment suppliers' premises and to inspect contractors who provide nuclear related services (such as design and engineering services) wherever those contractors are situated?
Answer	In compliance with the scope set out in the Atomic Act, SÚJB carries out inspections in particular on persons, to whom a permit was issued or who fulfilled the reporting duty according to the Atomic Act, with persons performing activities related to the utilization of nuclear energy and activities resulting in exposure, which require neither permit nor reporting, persons responsible for preparation or for the performance of interventions to mitigate natural exposure or exposure as a result of radiation accidents as well as with manufacturers, importers and suppliers of building materials and waters. The inspected persons may thus include suppliers of works and services, provided they participate in siting, design creation, manufacture, construction, commissioning, reconstructions, and decommissioning of nuclear installations as well as in repairs, maintenance and verification of systems of nuclear installations and special training of physical persons specialized from the nuclear safety perspective, regardless of the location of their workplace. The inspections need not include construction and equipment of suppliers' buildings if these do not affect the quality of performed activity or products important from the perspective of nuclear safety or radiation protection.

Q.No 28	Country	Article Article 8.1	Ref. in National Report
Question/ Comment	Are quality assurance requirements applicable to all plant equipment or just limited to safety-related equipment? Is risk information considered when determining if quality assurance requirements are applicable?		
Answer	In compliance with the relevant provision of the Atomic Act, whoever performs activities utilizing nuclear energy or radiation activites, apart from activities according to Section 2 letter a) points 5 and 6 of the Atomic Act, shall be obliged to introduce the quality system in a way and the scope set out by the implementing regulation, i.e. SÚJB Decree No. 214/1997 Coll., with a view to achieving the specified quality of the relevant item including tangible or intangible products, processes or organizational safeguarding with respect to its importance from the perspective of nuclear safety and radiation protection. The quoted decree applies to quality assurance of selected installations involving components or systems of nuclear facilities (i.e. including nuclear power plants) important from the nuclear and technical safety perspective, which are included in safety classes by their importance for operational safety of nuclear installations, by safety function of the system, whose part they are, and by the severity of their potential failure. In setting the requirements for quality assurance of selected installations, the graded approach is applied with respect to the complexity of processes, activities and their importance from the nuclear safety perspective and with respect to their inclusion in safety classes.		

Q.No 29	Country	Article Article 8.2	Ref. in National Report
Question/ Comment	The following question is of special interest for Germany for the further development in this field. As this item may already be covered by your report or by other questions posted by Germany, we do not expect repetitions of information already delivered. Please just give additional information as appropriate. It was decided at the Third Review Meeting to discuss this topic at the Fourth Review Meeting. Is the principle of effective separation (as given in Art. 8 Para 2) laid down explicitly in any binding national law or is this principle met by a sum of state organisational measures?		
Answer	The principle of effective separation as introduced in article 8 of the NSC is not word for word adopted by the legislation of the Czech Republic. It is in its complexity included in several regulations and in their mutual context. Act No. 1/1993 Coll., the Constitution of the Czech Republic, as a basic law of the Czech Republic, states in: • Article 2 Section 2 „State power shall serve all citizens and shall be performed only in situations, in conditions and in a manner as prescribed by law.“ • Article 79 Section 1 „The Ministries and another central administrative bodies shall be established and their authority shall be set down only by law.“ (it means also the SUJB)		

Analogously Act No. 2/1969 Coll., on Establishing of Ministries and Another Central Administrative Bodies, states in Article 20, „The Ministries and other central administrative bodies (including the SUJB) fulfill duties prescribed in laws and in other regulations in the field of their authority“.

The authorities and powers of the SUJB as the state administrative and regulatory body in the field of nuclear safety are set down in Article 3 of the Atomic Act and do not include any function concerned with the promotion or utilization of nuclear energy.

On the other hand, the Ministry of Industry and Trade according to Article 13 Section 1 of Act No. 2/1969 Coll. governs industrial and energy policy. Some specific research in the nuclear field is also supported by this Ministry.

The authorities of all central administrative bodies are strictly separated and independent in accordance with the above mentioned regulations, and conflict of interests is prevented for all state administrative bodies in the Czech Republic.

Q.No 30	Country	Article Article 8.2	Ref. in National Report
Question/ Comment	The following question is of special interest for Germany for the further development in this field. As this item may already be covered by your report or by other questions posted by Germany, we do not expect repetitions of information already delivered. Please just give additional information as appropriate. It was decided at the Third Review Meeting to discuss this topic at the Fourth Review Meeting. Is there any difference to your point of view between “effective separation” and “independence” as referred to in your report?		
Answer	The Czech nuclear safety regulator - SUJB - is independent, meaning independence from a legal and material point of view. This independence is realized through the creation of an independent central administrative body with its own budgetary chapter in the state budget. The chairman of the SUJB is appointed by the Prime Minister based on the recommendation of the government of the Czech Republic. Our opinion is that an effective separation is not so clear and is many times more questionable in comparison with the independence as described above.		

Q.No 31	Country	Article Article 8.2	Ref. in National Report
Question/ Comment	Subsection 3.1.2 mentions the right of SÚJB to take part in investigations of events with an impact on nuclear safety, radiation protection, physical protection and emergency preparedness including unauthorized handling of nuclear items or ionizing radiation sources. Couldn't such involvement of SÚJB in these investigations affect the independence of the Regulatory Body? It seems that the Regulatory Body must oversee the investigations performed by the operating organization and give an assessment of them as well as conduct its own investigations if necessary.		
Answer	Every month, the SÚJB performs independent inspections in event investigations with an impact on nuclear safety and radiation protection, possibly physical		

protection and emergency preparedness at the NPP.

These inspections are conducted by the operating organization and supervise how the operating organization assess all NPP events as well as how it conducts its own investigations. If necessary the Regulatory Body orders the operating organization to reinvestigate events.

Q.No 32	Country	Article Article 8.2	Ref. in National Report Section 3.1.2
Question/ Comment	It is noted that Czech Republic has a deregulated electricity market and a market regulator. What influence has SUJB over decisions taken by the electricity regulator when there is a potential for those decisions to be detrimental to nuclear safety?		
Answer	SUJB has no formal competence to influence a decision of the electricity market regulator (EMR); i.e. there is no duty of the EMR to consult its decisions with SUJB. The EMR has no right to influence the price of electricity production itself i.e. part of price paid to a producer. The EMR regulates the prices of electricity transport and delivery in a limited way (i.e. the price for those services is not arbitrarily decided by EMR but follows a quite complex system of construction). This influences (licensed) companies acting in electricity trade only. They are by law separated (i.e. as legal bodies with independent accounting), from production companies, even though they have a common owner (e.g. there are CEZ Production and CEZ Distribution and CEZ Selling). Therefore, a case in which a decision of the EMR influences nuclear safety is hardly imaginable. In any case, any EMR decision can be taken to a court if it violates any law e.g. Atomic law and thus may endanger nuclear safety.		

Q.No 33	Country	Article Article 9	Ref. in National Report
Question/ Comment	§ 9.1.2 refers at a few places towards the use of the Safety Monitor for decision making by the Licensee. Has SUJB undertaken a review or a validation of this Safety Monitor? Has SUJB set any boundary conditions or limitations on the use that the Licensee can make of this safety Monitor?		
Answer	The Licensee itself performed verification and validation Safety Monitor against the PSA model and detailed results of those processes were submitted to the SUJB during an independent review of the PSA model. SUJB accepted validity of the PSA model conversion and its results. There were no questions regarding the credibility of the results of the Safety Monitor. SUJB attempts to issue some kind of limitation criteria for the utilisation of Safety Monitor within the development of respective internal regulatory guidlines.		

Q.No 34	Country	Article Article 9	Ref. in National Report 4.1
Question/ Comment	"The level of nuclear safety, … is continuously assessed using the system of internationally comparable indicators". Which are these indicators ?		
Answer	Both CEZ NPPs use a comprehensive set of indicators in three categories (acceptability, safety and economic issues). All together there is a set of more than 60 indicators (all WANO indicators are included).		

The category of safety is subdivided into technology and process indicators, human performance indicators, environmental issue indicators and communication with the regulator indicators. The entire set of indicators is benchmarked in the framework of the EU.

Q.No	Country	Article	Ref. in National Report
35		Article 9	

Question/ Comment	The following question is of special interest for Germany for the further development in this field. As this item may already be covered by your report or by other questions posted by Germany, we do not expect repetitions of information already delivered. Please just give additional information as appropriate. It was decided at the Third Review Meeting to discuss this topic at the Fourth Review Meeting. Is the principle, that prime responsibility for the safety of nuclear installations rests with the holder of the relevant license laid down explicitly in any binding national law or is this principle met by a sum of regulatory requirements?
Answer	In addition to the information in Chapter 4/Article 9 of the National Report, it may be mentioned that according to the Constitution of the Czech Republic: 1/ State power may be applied only in cases, within limits and by methods defined by law - in this sphere it is the Atomic Act. 2/ Ministries, other administrative agencies and territorial self-governing bodies may issue legal decrees on the basis and within the scope of a law, if they are authorized to do so by law. Because this prime responsibility is specified by the Atomic Act, there is no authority given to SÚJB regulate this area by regulatory requirements.

Q.No	Country	Article	Ref. in National Report
36		Article 9	4.1, p. 35

Question/ Comment	In accordance with the current legislation of the Czech Republic represented particularly by the Atomic Act. The principle of responsibility of a licensee for nuclear safety of a nuclear installation has been broken down into a number of partial responsibilities, which together represent the over-all responsibility of a licensee for nuclear safety. Dukovany NPP and Temelín NPP are owned by the ÈEZ, a. s. company, which has, as a licensee, the primary responsibility for nuclear safety of its nuclear installations. The ÈEZ, a. s. company accepts responsibility for safety assurance at its nuclear power plants, personnel and public protection, and environmental protection. Q: What does this division of responsibilities among ÈEZ and the NPPs mean in practice? How do the NPPs fulfil their primary responsibility, if ÈEZ company has implemented significant organisation changes in order to make the economics of the plants operation more effective?
Answer	CEZ company has a clear definition of competence, responsibilities and accountabilities. Organisational structure, description of competencies and fulfillment of requirements is the base of responsibility distribution within CEZ company (between central headquarters and NPPs).

Despite the licence issued for CEZ, the plant director bears the primary responsibility for the safe operation of the plant and is accountable to CEZ to meet the requirements of all existing licences.

All managers have the secondary responsibility to assure nuclear safety in the field of their respective processes. Every time, the significant organisation changes are evaluated by the independent body (by the Safety Department) from the point of safety (nuclear, radiation, health, technical etc.) before they are implemented. All changes are also discussed with the Trade Unions.

Q.No	Country	Article	Ref. in National Report
37		Article 9	Section 3.1.2 1-(b) & (d), Page 28
Question/ Comment	It is mentioned that SUJB issues the license for construction and operation of NPPs. Where as in section 9.1.1 page # 58 3rd Para it is mentioned that Ministry of Industry and Trade (Dep't of planning and Building control) issues the license for the construction and operation. Please clarify ?		
Answer	According to Czech legislation, there is a disstinction between a licence for nuclear facilities (issued by SUJB according to the Act No. 18/1997 Coll. – Atomic Act) and a building permit for any building issued by building office (Act. No. 183/2006 – Building Act). The building office herewith issues a so-called operation permit before initiation of the permanent operation. Without approval of SUJB, the Building Office cannot issue a building permit and cannot approve the operation permit. According to the Building Act, the Ministry of Industry and Trade is in charge of the Building Office for buildings in the nuclear industry.		

Q.No	Country	Article	Ref. in National Report
38		Article 9	
Question/ Comment	The Report says that in accordance with the Atomic Act, the principle of major responsibility of the licensee for nuclear safety is broken down into a number of partial responsibilities, which together represent the overall responsibility of the licensee for nuclear safety. It seems that such an approach is not quite in line with Article 9 of the Convention which declares the prime responsibility of the operating organization. Such declaration of Operator's responsibility is the manifestation of the major principle of nuclear installation safety assurance - principle 1 in the IAEA standard Fundamental Safety Principles (SF-1), which must be directly declared in the legislation. Do you think that the adopted Act is in line with the declared major responsibility of the Operator as required by Article 9 of the Convention?		
Answer	The primary and unconditional major responsibility of the licensee for nuclear safety is set down in Section 4.1 of the Atomic Act (see the Report). This responsibility is explicitly emphasized by some further provisions of the Atomic Act (e.g. Section 17 paragraph 1 „A licensee under Section 9 paragraph 1 shall, besides other obligations established by law, ensure nuclear safety, radiation protection, physical protection and emergency preparedness, including its verification, in the scope appropriate to the particular licenses;“). The major responsibility of the licensee is further expressed in a more detailed way by particular duties and obligations to ensure nuclear safety. Thanks to the technical complexity of the task there are many of them and they are set down notably in Section 17 and Section 18 of the Atomic Act. They are not divided into separated		

„smaller“ and “bigger” responsibilities. The licensee is obliged to comply with all of them (with no exceptions) and his overall responsibility is thus cohesive and indivisible. In the case of a breach of any of the license obligations, the licensee is punishable for an administrative offence.

The responsibility diversification is only fictitious – the responsibility is united but its material aspects consist of many obligations which have to be met by the licensee. Breaching of any obligation results in responsibility realization in the form of punishment for the administrative offence.

Q.No 39	Country	Article Article 9	Ref. in National Report Para 9.1.2 page 63
Question/ Comment	Dukovany NPP applies so called ‘living PSA’ to simulate modifications. Are the results of this living PSA compulsory for obtaining regulatory permission for introduction of modifications?		
Answer	They are not compulsory (no legal requirements exist). Based on agreement between Operator and Regulator, PSA assessment is included in the application documents for modification permissions.		

Q.No 40	Country	Article Article 9	Ref. in National Report
Question/ Comment	Section 40 of the Atomic Act authorizes inspectors to require that remedial measures are adopted within established deadlines, impose corrective measures, inspections, tests and reviews, including the right to propose fines. Does SÚJB determine these remedial measures, corrective measures, or additional tests or does the licensee determine these and SÚJB determine the acceptability of the operator’s adopted measures? Are imposed deadlines, inspections, or fines based on the safety significance of the issue? How is the significance of the issue determined? Is it risk informed?		
Answer	As you write, Section 40 of the Atomic Act authorizes inspectors to require that remedial measures are adopted within established deadlines, impose corrective measures, inspections, tests and reviews, including the right to propose fines. Generally the SUJB determine these, but in many cases the licensee determines these and SÚJB determines the acceptability of the operator’s adopted measures. Deadlines, inspections, or fines are based on the safety significance of the issue. In many cases it is risk informed, mainly in the last few years.		

Q.No *	Country	Article Article 10	Ref. in National Report p. 38
Question/ Comment	1) It is stated that “In 2006 the CEZ created the Action Plan for Safety Culture Tasks. Could Czech give more details about this Plan?. 2) Could Czech give examples on the use of the set of nuclear safety indicators?.		
Answer	1/ The action plan of Safety Culture is prepared based on the periodic evaluation of Safety culture in both CEZ NPPs. The period between evaluations is approximately 3 years. When the list of findings is developed, a corresponding list of corrective action is elaborated and approved by CEZ management.		

Checking of corrective action fulfillment is performed by people from the safety section (independent to NPP operation). The timetable for its implementation is usually maximum 3 years – until the next Safety Culture evaluation.

2/ A Set of Safety Performance Indicators (SPI) is used to monitor the level of nuclear safety and radiation protection. The set of indicators is divided into four areas (Events, Safety Systems Performance, Barrier Integrity and Radiation Protection, within which is evaluated nuclear safety and radiation protection.

A summary of the main indicators and their development for the last six years is provided in Annex No. 6 of the National Report under the Convention on Nuclear Safety, which is available at:
http://www.sujb.cz/docs/NR_ENG_ANNEX_6_Indicators.pdf

Q.No 41	Country	Article Article 10	Ref. in National Report 5.1
Question/ Comment	The efforts taken by the operators of the NPPs regarding communication with the public can be considered as a good practice.		
Answer	Thank you for your comment.		
Q.No 42	Country	Article Article 10	Ref. in National Report pg 37
Question/ Comment	Please provide more details regarding the Action Plan for Safety Culture Tasks. What is the timetable for its implementation?		
Answer	The action plan of Safety Culture is prepared based on a periodic evaluation of Safety culture in both CEZ NPPs. The period between evaluations is approximately 3 years. When the list of findings is developed, a corresponding list of corrective action is elaborated and approved by management. A checking of corrective action fulfillment is performed by people from the safety section (independent to NPP operation). The timetable for its implementation is usually maximum 3 years – until the next Safety Culture evaluation.		
Q.No 43	Country	Article Article 10	Ref. in National Report 39/40
Question/ Comment	Good Practice: Communication with the general public: The Czech utility CEZ publishes on its homepage daily information on the status of each reactors of both sites in Czech, English and German		
Answer	Thank you for your comment.		
Q.No 44	Country	Article Article 10	Ref. in National Report
Question/ Comment	Reference to the Summary Report of the 3rd Review Meeting, item 36, 38, 42 and 43 The following set of questions is of special interest for Germany for the further development in this field. As some of these items may already be covered by your report or by other questions posted by Germany, we do not expect repetitions of information already delivered. Please just give additional information as		

appropriate. It was decided at the Third Review Meeting to discuss this topic at the Fourth Review Meeting.

1. Is a safety management system (SMS) planned or implemented?
2. What is the basis of the SMS (IAEA Requirements, other criteria)?
3. Is the implementation of a SMS voluntary or obligatory? (Does the regulator require the implementation of the SMS? If yes, how detailed are the requirements for the contents of the SMS?)
4. How is the SMS assessed and approved? (Does the regulatory body check whether the appropriate processes are implemented or available in the SMS? Does the regulatory body check whether and to which extent the applicable criteria for a safety management system are fulfilled? Is the authority entitled to inspect the results of the SMS assessment and if so, to which extent?)
5. How is an external review process performed?
6. What are the key elements of an SMS? (Indicators, Integrated or stand alone system, Continuous improvement and treatment of deviations (Are there regulations how to handle deviations from the specified process?); Participation on benchmarks exercises of licensees

Answer The Management system of NPPs from the point of safety is referred to as Safety MS.

1) The new (modified SMS) is currently being implemented within the framework of the Integrated Management System, developed based on IAEA standard GS-R-3 in the CEZ Company.

2) IAEA Requirements from GS-R-3 and other criteria derived from ISO 9001.

3) Implementation of an IMS is voluntary. Specific requirements for the SMS do not currently exist in the Czech legislation.

4) The Czech Atomic Act requires in Article 4 that any person performing or providing for practices related to nuclear energy utilisation or radiation practices must have an implemented quality assurance system, which shall stipulate and document, except others:
- responsibilities, competencies and mutual links of persons who manage, perform, evaluate and verify the activities influencing the quality of items important from the viewpoint of nuclear safety and radiation protection,
- a procedure for partial activities or their comprehensive sets, important from the viewpoint of nuclear safety and radiation protection (further on “processes”).

This system must be described in the document “quality assurance program”, which must be submitted to the State Office for Nuclear Safety (SUJB) for approval. During the review of submitted documents, the SUJB assesses how the requirements of the Act and the connected Decrees are met. Occasionally, the reality is also inspected at the Licensee premises.

The SÚJB has the right to inspect “everything” connected with or influencing nuclear or radiation safety, however the inspection of the SMS assessment has not been carried out up to now.

5) It is not required to perform an external review process.

	6) The key elements are safety, environment and quality. Criterion used include Safety Requirements IAEA GS-R-3 Management system for facilities and activities, CSN EN ISO 14001, CSN EN ISO 9001 and OHSAS 18001. The internal regulation is preparing. The problem is solving by partial regulations, for example CEZ internal document: “Feedback form operations experiences”. We participate on benchmarks through WANO indicators and partnership audits by WANO and IAEA.

Q.No	Country	Article	Ref. in National Report
45		Article 10	

Question/ Comment	The following question is of special interest for Germany for the further development in this field. As this item may already be covered by your report or by other questions posted by Germany, we do not expect repetitions of information already delivered. Please just give additional information as appropriate. It was decided at the Third Review Meeting to discuss this topic at the Fourth Review Meeting. Is the principle of priority to safety laid down explicitly in any binding national law or is this principle met by a sum of regulatory requirements?
Answer	This principle is primary defined by Section 4 paragraph 3 of the Atomic Act as described by Chapter 5/Article 10 of the National Report. The priority of safety is secondarily developed in related implementing regulations to Atomic Act, for instance during the commissiong and operation of nuclear facilities.

Q.No	Country	Article	Ref. in National Report
46		Article 10	5.Priority to Safety

Question/ Comment	There seems to exist a possible conflict between the interest of the operator (CEZ) which wants to continue Temelin operation, and the requirements of safety, which indicate that in such situations with unreliable reactor scram system, the plant should be stopped until the modifications are implemented and the safety hazard is mitigated. This situation deserves close attention and high transparency of actions of SUJB is needed to demonstrate that in cases of possible conflicts the motto "safety comes first" is always followed. • What are the measures which the operator has undertaken to assure mitigation of hazards? • Taking into account gradual deterioration of the situation with control rod insertion in Temelin NPP, which measures have been taken and/or are planned to ensure that safe operation of NPP Temelin is maintained during the time remaining to the moment of changing the fuel producer?
Answer	First of all, there is no problem (conflict) with safety. Rod drop tests are performed periodically, which proves that safety is not compromised. There is no gradual deterioration – this is a misunderstanding! Partial replacement of modificated fuel assemblies (VVANTAGE with new design) are periodically performed (two refuellings on UNIT1 in 2007). General elimination of the IRI issue is expected after the entire core is replaced with the fuel from a different supplier (2010).

Q.No	Country	Article	Ref. in National Report

47		Article 10	page 38
Question/ Comment	Could you please provide more information on the development and implementation of the Action Plan for Safety Culture Tasks?		
Answer	The Action plan of Safety Culture is prepared based on the periodic evaluation of Safety culture in both CEZ NPPs. Period between evaluations is approximately 3 years. When the list of findings is developed, a corresponding list of corrective action is elaborated and approved by the management. Checking of corrective action fulfillment is performed by people from safety section (independent to NPP operation).		
Q.No 48	Country	Article Article 10	Ref. in National Report Pg 38, Para 5.12
Question/ Comment	It was noted that under the “Supervision of nuclear safety”, organizations which participate in design, manufacturing, construction and operation of nuclear power plants are subject to SÚJB inspections. How often are these inspections carried out and is the IAEA review mission involved in the inspections?		
Answer	The inspections are not usually planned; however, there are planned inspections for activity of authorized persons within the scope of technical safety surveillance. Part of these inspections is also the inspection by manufacturing organizations. These inspections are primarily carried out in association with findings of own inspection activity of the SÚJB as well as in connection to generally acquired information and knowledge of other entities operating in nuclear power engineering. Inspection frequency depends on these findings and knowledge. The IAEA review missions do not deal with these inspections.		
Q.No 49	Country	Article Article 11.1	Ref. in National Report
Question/ Comment	What financial resources are budgeted annually for plant safety improvements?		
Answer	To understand the financial value of safety improvements, expenditures one must take into account that the majority of sources are connected not only with the safety or protection but mostly at the same time with reliability to assure the required plant load factor or the availability. Only a small amount of measures or means could be separately enumerated. For example - how to divide changes of obsolete I&C systems in order to continue production and to improve safety? Investment to safety means an investment into the safety qualification assurement and lifetime extension of systems and components and also people knowledge and skills that is not directly equal to electricity production. There is no doubt that safety is the first priority in any activity in CEZ NPPs. We don’t separately calculate the cost of safety but we monitor the maintenance as well as investment budgets and their trends. If the budget planning process leads to its decreasie in comparison to last year’s then an evaluation is done whether or not it is appropriate, taking into account the safety related systems reliability data or safety related events etc. Changing out the already mentioned DukovanyNPP I&C equipment cost altogether more than 10 billion Crowns. As to what part belongs directly to safety improvement, we are not able to say. Annually CEZ spends several billions Crowns to modification and maintenance of equipment. Of course such data are also proprietary for any company and we could not provide exact data even if we had		

them.

Q.No	Country	Article	Ref. in National Report
50		Article 11.1	6.1.2
Question/ Comment	Financial reserves are to be established for the preparation and actual decommissioning of nuclear installations. Does this also include the costs for radioactive waste (treatment, storage and disposal) produced during the decommissioning ?		
Answer	Financial reserves for the decommissioning of nuclear installations (nuclear power plant) created by licensee in accordance with the Atomic Act (Section 18, paragraph 1, letter h)) will be, in case of decommissioning, used among others on decontamination, dismantling, demolition, congregation, sorting, adjustment, processing, stocking, transporting etc. of all atomic waste resulting from the decommissioning. The corresponding money is deposited onto special separate banking account in the Czech bank and the Atomic Act strictly determines the conditions for its use. This money creates a part of licence holder's property, but the law protects it against distrainment or licence holder's bankruptcy.		

Q.No	Country	Article	Ref. in National Report
51		Article 11.1	6.1.3
Question/ Comment	Does the training also include training on emergency operating procedures (EOPs) and severe accident management guidelines (SAMGs). Does the simulator training also include these EOPs and SAMGs ?		
Answer	Yes, simulator training of the operators, unit shift supervisors and safety engineers also includes training on EOPs (including basic training, periodic training and staff retraining). All major types of accidents are simulated including events combination. Several accident scenarios beyond design bases are also partially included (e.g. station blackout, ATWS). The simulator models are continuously upgraded and the scope of simulated scenarios is regularly extended. The output data from the simulator are available in the Technical Support Centre and TSC personnel are also regularly involved in simulator training. From this year, the reactor physics staff will also be involved in simulator training. In the terms of SAMG, only the transition from EOPs to SAMG can be trained on the simulator. Plant responses during severe accidents are out of the scope of the simulator model. Of course, severe accident aspects are part of the classroom training. Furthermore, the specialized training of Technical Support Centrum Members in SAMG usage was held in cooperation with a Westinghouse specialist last year. During emergency drills, mostly precalculated severe accident scenarios are used to train required SAM responses.		

Q.No	Country	Article	Ref. in National Report
52		Article 11.1	6.1.3
Question/ Comment	Could you please give some more information on how CEZ evaluates the adequacy and the good comprehension of the training to employees of external suppliers ?		
Answer	We have two sources for evaluating external suppliers training: 1) feedback from trainees, trainers and managers, 2) direct verification of personnel knowledge (testing after the training)		

Q.No	Country	Article	Ref. in National Report

53		Article 11.1	6.1.2
Question/ Comment	High level nuclear waste. The measures taken to safely store medium and low level radioactive waste are described in the report. However, there is no information on high level waste, in particular due to spent fuel elements. The report says: "Financial means to be used to cover costs of radioactive waste and spent fuel disposal are, in accordance with the Atomic Act, deposited by the waste generators to a Nuclear Account opened at the Czech National Bank." In the case of decommissioning the NPP, the report says "The amount of this reserve shall be established based on the decommissioning technology approved by the SÚJB and based on the estimate of the costs for given decommissioning technology verified by Radioactive Waste Repository Authority." However, there is no information on the method to be used to establish the costs of high activity water storage. • What are the plans of the Czech Republic in respect of high level waste repository? • Both Dukovany and Temelin NPP have been in operation for several years and the funds for decommissioning have been accumulating. Since the report says that : "The amount of this reserve shall be established…", what was the basis for payments to the decommissioning fund so far?		
Answer	The geological investigation for a high-level waste repository has been suspended (to the year 2009) while a discussion with communities continues. The amount of financial reserves for the decommissioning of nuclear installations (nuclear power plant), that the licence holder creates in accordance with the Atomic Act (Section 18, paragraph 1, letter h)), determines the licence holder itself with regard to the expected decommissioning method. It must be a part of the documentation submitted when applying for permission to any particular step of installation and commissioning of the nuclear technology. The estimation of the cost of decommission of the nuclear installations is verified by the Radioactive Waste Repository Authority.		
Q.No 54	Country	Article Article 11.1	Ref. in National Report
Question/ Comment	You reported that in the ÈEZ Safety and Quality Assurance Policy the provisions of sufficient resources for assurance of nuclear safety…. are described Does the applicant have to prove that sufficient financial resources are guaranteed throughout the operating life time of a facility (i.e. for the case of bankruptcy or winding up of the licensee) as a condition to get (or extend) the operation licence; if YES, is this a »Safety and Quality Assurance Policy« or something else?		
Answer	There is no requirement to prove financial resources throughout the operating lifetime. According to the Atomic Act it is necessary to declare an insurance certificate covering nuclear damage liability insurance or a certificate of other financial security. In the event that radioactive waste is to be generated as a part of activities being licensed, a document demonstrating the safe management of radioactive waste, including the associated funding of this management.		
Q.No 55	Country	Article Article 11.2	Ref. in National Report p. 41
Question/ Comment	Retirement or turnover related issues are not mentioned in the report. Could Czech Republic provide information concerning the average age of NPP staff?Does the		

	Czech Republic meet difficulties due to retirement?		
Answer	The average age of Dukovany NPP staff is 46 years, at Temelin NPP it is 42 years. During the next 10 years CEZ will prepare a gradual turnover of several dozens of employees.		
Q.No 56	Country	Article Article 11.2	Ref. in National Report Section 6.1.3, Page 43
Question/ Comment	It is stated that Legislation “"entrusts performance of the specified activities only to such persons who fulfill conditions of special professional competence and are physically and mentally sound". What is the time period between medical /or mental checkups for such persons?		
Answer	Control room operators, unit heads , shift supervisors and nuclear physicists have a 2-year period between mental checkups and a 1-year period between medical checkups.		
Q.No 57	Country	Article Article 11.2	Ref. in National Report page 43
Question/ Comment	Please provide more information on the role of SUJB in licensing selected personnel of the NPPs. What are the categories of personnel for which a license issued by SUJB is necessary?		
Answer	The Regulatory Body (SÚJB) issues authorizations and establishes a State examination Body for the verification of special professional competence and issues statutes for this commission and specifies activities directly affecting nuclear safety. A Licence issued by the Regulatory Body (SÚJB) is required to train selected personnel. Special professional competence, means skills and expertise of natural persons as verified by a State Examination Body. The State Examination Body is established and its Chairman and members are appointed by the Chairman of the Regulatory Body (SÚJB). Activities directly affecting nuclear safety may only be performed by natural persons who are physically and mentally competent, with professional competence and to whom the Regulatory Body (SÚJB) has granted an authorization for the activities in question, subject to an application by the licensee. Activities directly affecting nuclear safety, qualification and professional training requirements, the method to be used for their verification and the issue of authorizations for persons authorised to perform activities (also as "selected personnel") are laid down in implementing regulation. The licensee, in addition to other obligations established by law, entrusts performance of specified activities only to such persons who fulfill conditions of special professional competence, and are physically and mentally sound. For persons performing sensitive activities under a specific legal regulation, they mustverify their competence with respect to security in a manner laid down in by specific legal regulations. The licensee provides a system of training, verification of competence and special professional competence of personnel in accordance with the importance of the work they perform.		

WHAT ARE THE CATEGORIES OF PERSONNEL FOR WHICH A LICENSE ISSUED BY SUJB IS NECESSARY?

Working activities having a direct impact on nuclear safety ("selected personnel"). Activities performed in a control room and emergency control room, including self-reliant reactor shutdown, control and supervision in the course of commissioning and operating the entire nuclear power installation (SHIFT SUPERVISOR, SAFETY SUPERVISOR).

Activities performed in a control room and emergency control room, including self-reliant reactor shutdown, control and supervision in the course of commissioning and operating a single reactor unit (UNIT SUPERVISOR, CR SUPERVISOR).

Activities performed in a control room and emergency control room, including self-reliant reactor shutdown, control and supervision in the course of commissioning and operating a reactor unit’s primary part (REACTOR OPERATOR).

Activities performed in a control room and emergency control room, including self-reliant reactor shutdown, control and supervision in the course of commissioning and operating a reactor unit’s secondary part (TURBINE OPERATOR).

Direct control of the implementation of individual steps within tests of physical and power start up in a reactor unit’s control rooms (CR PHYSICIST).

Control and supervision of handling individual fuel assemblies inside the reactor unit out of the fresh fuel storage equipment (FUEL PHYSICIST).

Q.No 58	Country	Article Article 11.2	Ref. in National Report page 48
Question/ Comment	Does CEZ provide any specific training for the contractors?		
Answer	No, all contractors come through standard access training and examination. In addition to the access training (on site and control zone), CEZ also provides basic training for heads of working groups and a special training for the users of ISE PassPort – job management application.		
Q.No 59	Country	Article Article 11.2	Ref. in National Report page 45
Question/ Comment	Could you please provide examples of what job positions are included in the category “selected personnel” as part of the five training groups? What are the qualification and competence requirements for the training instructors?		
Answer	Selected personnel – they are control room operators, unit heads , shift supervisors and nuclear physicists. The qualification requirements for the training instructors are usually higher than the requirements of trainees.		
Q.No 60	Country	Article Article 12	Ref. in National Report

Question/ Comment	1. What categories of NPP personnel are obliged to attend training courses targeting the prevention of human errors?
Answer	Operation personnel (control room operators, field operators) have organized training days which include information on selected operational events, based on the specialization of the trained personnel and with regard to cases of human failure. Employees involved in the investigation of causes of human failure are trained in ASSET and HPES methodologies.

Q.No	Country	Article	Ref. in National Report
61		Article 12	

Question/ Comment	2. What percentage of operational events is caused by human errors (please provide information over e.g. a period of 5 years)?
Answer	The number is about 25 % of events caused by human errors.

Q.No	Country	Article	Ref. in National Report
62		Article 12	

Question/ Comment	3. Is the SÚJB project "Methodology of Human Factor Assessment in Operation of Nuclear Installations" completed and what are the results?
Answer	The project has been completed. The main outcomes of the project are as follows: • Methods to identify performance shaping factors (PSFs – qualitatively and quantitatively) and organizational factors (OFs –qualitatively and semi quantitatively) involved in the event. Apart from the benefit gained by detailed qualitative analysis, the method attempts to assess the seriousness of the event regarding human contribution quantitatively (on the ground of indentified factors). • Method to assess organisational changes based on the identification of PSFs and OFs involved. The method uses a semi quantitative approach and seems to be suitable for a preliminary assessment since it gives relatively quick results without using approaches directly working with the PSA model (e.g. those described in US NRC NUREG-1764). The implementation of the methods is in the testing phase at present. Example of partial results: The most important PSFs as per their occurrence in the operational events and as per their weight are presented in the following list in the order of their importance. 1. Inadequate procedure (comprehensiveness and correctness) 2. Availability of up-to-date procedures, instructions, and programmes 3. Occupational safety 4. Dynamic and complex task 5. Communication 6. Ergonomics, design, man-machine interface 7. Availability of independent support (number of people, consultants solving the problem) 8. Experience, skill 9. Education, training, knowledge of procedures 10. Cognitive based action

Q.No	Country	Article	Ref. in National Report
63		Article 12	pgs 50-51

Question/ Comment	What are the key elements of the methodology for operational events evaluation in connection with the performance shaping factors and the methodology for the

organizational factor analysis which were the output of the SUJB project named Methodology of Human Factor Assessment in the Operation of Nuclear Installations?

Answer

The methodology provides a set of 47 performance shaping factors (PSFs) divided into 10 categories and a set of 55 organisational factors (OFs) divided into 12 categories.

The choice of PSFs was inspired by such methods as THERP, CREAM or HEART. The set of OFs was inspired by the previous work of SEGHOF and its predecessors.

A detailed analysis of operational events was performed with regard to PSFs and OFs. The ten most important PSFs were then used for further analysis in HRA model of Dukovany NPP.

The main outcomes of the project are as follows:
• Methods to identify PSFs (qualitatively and quantitatively) and OFs (qualitatively and semi quantitatively) involved in the event. Apart from the benefit gained by a detailed qualitative analysis, the method attempts to assess the seriousness of the event regarding human contribution quantitatively (on the ground of indentified factors).
• Method to assess organisational changes based on identification of PSFs and OFs involved. The method uses a semi quantitative approach and seems to be suitable for a preliminary assessment, since it gives relatively quick results without using approaches directly working with the PSA model (e.g. those described in US NRC NUREG-1764).

The implementation of the methods is in the testing phase at present.

Q.No 64	Country	Article Article 12	Ref. in National Report

Question/ Comment

What human performance improvement tools are used by Temelin and Dukovany NPPs?

Answer

All tools for individuals, managers and organization proposed by WANO/INPO guidelines (Principles for Excellence in Human Performance) are in the offer. Different departments select different HU improvement tools based on appropriateness for the activities performed (different for operational staff, others for technical support staff, etc.)

Q.No 65	Country	Article Article 12	Ref. in National Report

Question/ Comment

The Report states that the need for taking into account human factor impact on nuclear installation safety results from the general provisions of the legislation and of SÚJB's regulatory documents. Measures taken in this regard by the Operator and by the Regulator are described. However, neither this section, nor the section on safety priority mention the efforts to introduce and maintain high level of safety culture, which is a key element to control human factor and assure priority to safety. What is the role of "safety culture" in human activity and what basic provisions of this concept have been adopted in Czech Republic?

Answer

SUJB basically adopts the IAEA concept of safety culture and recognizes its importance for nuclear safety, although safety culture is nowhere specifically mentioned in Czech legislation. A growing concern for safety culture issues resulted

in a new type of team inspections focused on the licensee's top-level management where safety culture is addressed as a part of safety management system.

Safety culture permeates the work of all inspectors, however, it is not yet monitored systematically. The information about safety culture is gathered from various sources like root causes database from operational experience feedback (including INES evaluation), deficiencies mentioned in SUJB inspection records, periodic safety review reports, inspections on licensee top-level management, etc. Personal insights from informal and semi-formal interviews are shared through internal discussions at SUJB.

Findings regarding safety culture are regularly communicated during annual summits between SUJB and the licensee.

Q.No 66	Country	Article Article 12	Ref. in National Report Para 7.1.1, page 50
Question/ Comment	The report refers to the so-called «training days» that are conducted to improve NPP performance reliability. What categories of personnel are involved in such a training? How often is this type of training performed for the non-engineering personnel?		
Answer	All NPP employees are obliged to attend "training days"; the operation personnel (control room operators, field operators) have 4 – 6 training days a year, the non-engineering personnel have min. 1 training day a year.		
Q.No 67	Country	Article Article 12	Ref. in National Report Page 50
Question/ Comment	It is widely recognised that the human element in events is associated with organisational aspects of human behaviour as well as the individual aspects. How does the regulatory body assure itself that the organisation of the licensees, at sites and elsewhere are appropriate for safe behaviour? How does it assure itself that corporate goals and objectives to give safety the highest priority are delivered in practice by the organisation? How does it assure itself that organisational changes to site and other parts of the licensee do not jeopardise safety?		
Answer	1. „How does the regulatory body assure itself that the organisation of the licensees, at sites and elsewhere are appropriate for safe behaviour?" This is a very interesting issue that keeps SUJB occupied. SUJB approves documentation and programmes where the organization is described. The existence and implementation of a system of quality assurance is subject to inspection. This approach is supported by legislation changes in which SUJB adopts WENRA reference levels and tries to be consistent with recent IAEA documents (e.g. GS-R-3). At the present time a growing concern for management systems resulted in a new type of team inspections focused on licensee's top-level management. 2. „How does it assure itself that corporate goals and objectives to give safety the highest priority are delivered in practice by the organisation?" During inspections in the field of quality assurance (e.g. the above mentioned specialised inspection) the inspectors deal systematically with top level documents containing the corporative goals and objectives. Then they verify their application in lower level documents. The delivery in practice is examined via interviews and operating experience feedback.		

3. „How does it assure itself that organisational changes to site and other parts of the licensee do not jeopardise safety?“
The licensee delivers a safety assessment of the organizational change before its realization. The assessment always contains a justification of the proposed change and is made according to an approved methodology in order to assure that nuclear safety, radiation and physical protection, and emergency preparedness will remain either on the same level or will be strengthen by the proposed change. Safety relevant changes also usually require revision of the programme of quality assurance which cannot be made without approval of SUJB. The evaluation of the effectiveness of the organizational change can be subject to review / inspection done by SUJB should the change be substantial.

Q.No 68	Country	Article Article 13	Ref. in National Report

Question/ Comment	Has the SÚJB established its quality management system? If yes, according to which standards and how was it assessed?
Answer	Quality assurance of SUJB practices is determined by hierarchical structure of internal documents. The core is: • Rules of Organization. This determines the organizational structure and basic division of responsibilities and competences. The mission, tasks, basic working methods are also laid out here. The basic procedures for the work are set by: • Internal SUJB Directives (e.g. Directive Setting up Roles and Responsibilities In the Process of Approval of SAR) and • Methodological Instruction (e.g. Methodological Instruction for Activities in Case of Loss, Finding or Capture of Radioactive Materials). • Decrees of the Chair. Roles and responsibilities in temporary tasks are defined here. The internal documentation forms a system ensuring that the activities are planned, managed, carried out and evaluated by competent persons (management, nuclear safety inspectors etc) and accompanied by appropriate documentation. The above mentioned internal documentation of the SÚJB is managed, i.e. proposed, agreed and approved, by assigned persons. Documentation outputs are managed in an analogous manner and duly archived. Important documentation outputs are kept in both paper and electronic form. Execution of operations according to the respective decrees, directives and methodological instructions is subject to an internal control system (independent audit). Consequently, the manner of SÚJB management partially meets the requirements for a quality system which, however, is not certified.

Q.No 69	Country	Article Article 13	Ref. in National Report page 53

Question/ Comment	ČEZ company has practiced extensive use of safety performance indicators. Can you provide additional information on the experience so far and current practices? What is the regulator’s role in monitoring the development of such indicators?
Answer	Both power plants use a common set of safety indicators for the monitoring of safety performance derived from TECDOC 1141. The safety indicators evaluate: Fluency of operation (unplanned power reduction, unplanned start-up of safety systems, tightness of the barriers), risk of operation (safety system unavailability, SS failures at start-up and during operation, emergency events, TS violations, risk

based indicators) and approach to safety (significant events, human factor, radiation protection, fire protection, security protection, waste).

Both power plants use the software application INDI (Indicator Display System) for evaluation and monitoring. Evaluation results are given monthly in the Reports on the safety status.
Safety indicators complementing WANO PI provide for a comparative analysis of the safety level and safety culture at our NPPs and those at foreign NPPs, and allow for the release of operational 'weaknesses' and an outline of the ways for improvement.

The Czech regulator does not monitor the development of all indicators, it is focused only on the set of the so-called common indicators.

The changes in the definition, data collection and others must be agreed by both sites – Licensee and Regulator.

Q.No 70	Country	Article Article 13	Ref. in National Report Section 8, Page 52
Question/ Comment	It is stated that "Each Contracting Party shall take the appropriate steps to ensure that quality assurance programmes are established and implemented with a view to providing confidence that specified requirements for all activities important to nuclear safety are satisfied throughout the life of a nuclear installation." What measures are in place to deal with non-conformances with QA programme implementation?		
Answer	A supplier who fails to implement an acceptable quality assurance or demonstrate the incapability to meet the administrative, technical, and quality requirements specified for procurement shall be removed from the Approved Suppliers List (ASL). The company CEZ has set up some procedures which provide basic information about the responsibilities and accountabilities of management. Procedures describe requirements for the evaluation of suppliers, as well as monitoring supplier and sub-suppliers performance in accordance with quality requirements. These procedures are related to the processing of the external audits and suppliers evaluation system.The annual plan for audits is approved by the executive managers and is the basic document for managing those activities. The supplier evaluation system provides a high standards of outputs, these then being implemented in the safety related items and services. Relevant outputs from the auditing processes, suppliers and sub-suppliers evaluation system are available in the electronic form using software application. All evaluation data is supported by the software application. The system uses predetermined measurable criterions. Data in this application is kept in electronic form in the ASL. The ASL shall indicate that the supplier's and sub-supplier's quality management system has been evaluated and found acceptable via a CEZ audit. A supplier who fails to implement an acceptable quality assurance or demonstrate the incapability to meet the administrative, technical, and quality requirements specified for procurement shall		

be removed from the ASL.

Q.No 71	Country	Article Article 13	Ref. in National Report

Question/ Comment	On page 53, it is mentioned that the quality system currently introduced observes IAEA recommendations in the Safety Series. Could you please provide information on any actions taken by CEZ to implement an integrated management system in line with the requirements of GS-R-3?
Answer	The project ”Integrated Management System” was approved by the Chief Executive Officer in November 2007. The goal is Management System implementation based on the process model with integrated requirements for quality, safety and environment. The system provides fulfillment of economical, safety and other requirements as recommended by IAEA to organizations running NPP’s. The project team was approved by the Chief Executive Officer. The head of the team is Director of Quality Management Section. Team members come from relevant divisions taking part in the project. The CEZ Group is too large of a subject to realize system implementation at once. For this reason the project has been divided into several stages: * nuclear (including all processes dealing with operation and safety of NPP’s) * general (including all areas managed by Chief Executive Officer) * group (including all areas managed by General Director and subsidiary companies) The time schedule has been approved. Implementation of the Integrated Management System will be realized in 2008 – 2010. Further implementation in CEZ Group will follow.

Q.No 72	Country	Article Article 13	Ref. in National Report

Question/ Comment	It is not quite clear from the presented description, whether the Operator performs the monitoring of subcontractors' work and in what way. Briefly discussed were external audits of suppliers, but it was not said who performed these audits. There is also no information on how are other subcontractors controlled. Regarding the monitoring of subcontractor activity there is only a brief mentioning of this matter in the subsection which describes Regulator's quality assurance activity. In what way does the Operator monitor the activities of subcontractors?
Answer	The company CEZ has setup some procedures which provide basic information about the responsibilities and accountabilities of management. Procedures describe requirements for the evaluation of suppliers, as well as monitoring of supplier and sub-supplier performance in accordance with quality requirements. These procedures are related to the processing of external audits and the suppliers evaluation system. The annual plan for audits is approved by executive managers and is the basic document for managing those activities. The supplier evaluation system provides high standards of outputs, these being then implemented in the safety related items and services. Relevant outputs from the auditing processes, suppliers and sub-suppliers evaluation system is available in electronic form using software application.

All evaluation data is supported by software applications. The system uses predetermined measurable criteria.

Data in this application is kept in electronic form in the Approved Suppliers List (ASL). The ASL shall indicate that the supplier's and sub-suppliers quality management system has been evaluated and found acceptable via a CEZ audit. A supplier who fails to implement an acceptable quality assurance or demonstrate an incapability to meet the administrative, technical, and quality requirements specified for procurement shall be removed from the ASL.

Q.No *	Country	Article	Ref. in National Report
		Article 14.1	p. 58

Question/ Comment: Please show for example through a flow sheet, all the organizations that participate for the construction permit or and operating license of a NPP, resume the responsibilities of each one and explain how superposition or lack of responsibilities are avoided.

Answer: The so-called "licensing" process for nuclear installations is regulated by the Building Act (No. 183/2006 Coll.), the Atomic Act (No. 18/1997 Coll.) and the Environmental Impact Assessment Act (No. 100/2001 Coll.) and their implementing regulations.
Issuance of three basic authorizations (licences) for all nuclear installations, i.e. site permit, construction permit and operation permit from the standpoint of the Construction Act, is within the competence of the corresponding Construction Office. It is the local Construction Office for the site permit and the Ministry of Trade and Industry for construction and operation permits.
In the case that issues protected by special regulations arise during the course of licensing proceedings, the Construction Office decides by agreement or with the consent of the State Administration Body which protects those particular interests.
The nuclear installations licensing procedure includes bodies illustrated in Annex.
The Body concern may condition its consent on the fulfillment of conditions established in its decision issued in compliance with authorization of relevant specific law.
Those bodies are in particular:
• Ministry of Interior - concerning fire safety,
• Ministry of Environment - in the case of site and decommissioning licences – Environmental Impact Assessment (EIA)
• Local Authority - concerning waste management, water consumption and waste water discharges,
• Ministry of Health – concerning occupational health protection,
• State Office for Work Inspection (SOWI) - concerning conventional safety, including the safety of the electrical systems,
• State Office for Nuclear Safety (SUJB) - concerning nuclear safety, radiation protection, physical protection, emergency preparedness and industrial safety (pressure vessels).
The Construction Act directly impose on the Construction Office the duty to obtain from the applicant (constructor, operator) the permission issued by the State Office for Nuclear Safety in compliance with the Atomic Act still before the issuance of the site permit, construction permit, and of any subsequent permit in respect to the nuclear installation containing project. In compliance with the provisions of the Act,

the decision of the Construction Office cannot be issued without this permission.

Support Documents	» Czech Republic Annex to Answer

Q.No	Country	Article	Ref. in National Report
73		Article 14.1	9.1.2

Question/ Comment	Several improvements are mentioned to be under way (e.g. severe accidents, hydrogen combustion, …). Could you give some more details for each aspect ?
Answer	Upgrading of hydrogen recombiners – Temelin NPP In 2007, the project for evaluating the hydrogen concern in Temelin containment during severe accidents was finished and the following was performed: • Methodology for evaluation of hydrogen concern during deflagration-to-detonation transition • Detail containment model and containment nodalization for MELCOR 1.8.5 code • Detail hydrogen distribution analyses of selected scenarios (scenarios selected based on deterministic and probabilistic evaluation) • Based on performed calculations, conditions for deflagration-to-detonation transition can only be satisfied after reactor vessel failure during MCCI (ex-vessel phase of severe accident) • Based on preliminary design, hydrogen detonation during severe accidents could be prevented using passive catalytic recombiners with sufficient capability (several times greater than for design base accidents) Measures for enlargement of the molten core area under the reactor pressure vessel – Temelin NPP. The Temelin accident management programme is built based on the robust VVER1000 design and on the complete package of symptom-oriented EOPs and SAMG. Even if this approach were sufficient for most existing PWRs, the Temelin design resistance against severe accident phenomena is continuously increasing. The main focus is oriented towards MCCI moderation with aim to prevent a containment basemat melt-through. The main design modification are the following: • Plugging ionization chambers channels through the containment basemat (Unit 1 – completed during outage in 2007, Unit 2 – scheduled for outage in 2008) • Enlargement of the area for molten core spread after reactor vessel failure (opening doors between the reactor cavity and corridor and installation of removable barriers to localize corium) (Design modification preparation in progress) • Enlargement of coolant inventory inside containment for corium cooling (Design modification in progress, scheduled for outages 2009 – 2010). NPP Dukovany project improvement to manage several accidents: The Dukovany accident management programme is based on the relatively robust VVER440 design and on the complete package of symptom-oriented EOPs and SAMGs. Although this approach is sufficient for existing legislative requirements, the Dukovany design resistance against severe accident phenomena is continuously increasing: • Preparation of hydrogen combustion system - In 2007, the project for the evaluation of hydrogen concern in Dukovany containment during severe accidents was finished and the following was performed: o Methodology for evaluation of hydrogen concern during deflagration-to-detonation transition

o Detail containment model and containment nodalization for MELCOR 1.8.5 code
o Detail hydrogen distribution analyses of selected scenarios (scenarios selected based on deterministic and probabilistic evaluation)
o Based on the results, apreliminary hydrogen combustion system was designed to control hydrogen concentration below the conditions for deflagration-to-detonation all the time during severe accident conditions. Using the passive catalytic recombiners with sufficient capability (several times greater than for design bases accidents) is proposed.
• Measures for In-vessel core debris retention and coolability via external cooling of the reactor pressure vessel:
o The installation of reactor cavity level measurement is in progress (unit 3 completed, the other unit will be completed this year)
o Preparation of design modification to allow gravity driven flooding of the reactor cavity room through ventilation line is in progress, scheduled for outages 2009 – 2012
Design modification is planned to allow steam release around the reactor vessel from the cavity room into the containment.

Q.No 74	Country	Article Article 14.1	Ref. in National Report
Question/ Comment	International cooperation for regulatory related nuclear safety research is an important issue to be considered. What is your view or opinion concerning the needs in your country for large nuclear safety related experimental test programmes to study physical phenomena and to validate analysis models used in safety analysis (e.g. three dimensional reactor physics and ther-mal hydraulic models etc)? Are such experimental research and analysis work needed for safety upgrading or assessment of safety in case of periodic safety review or plant life extension in your country or for new reactors?		
Answer	SUJB supports all activities associated with the development of realistic models for safety analysis and their validation on results of nuclear safety-related experimental test programs. According the SUJB methodology, all codes used for safety analysis must be validated for the area of application. This methodology is also applied to the analytical support of applications for plant life extension and (maybe in future) for new reactors.		

Q.No 75	Country	Article Article 14.1	Ref. in National Report
Question/ Comment	Is there a requirement in your country to apply PRA methods to support periodic safety review, licensing of plant life extension or power upgrade, or licensing of new build?		
Answer	Actually the probabilistic approach to nuclear safety is not required by Czech legal framework, excluding only the specification of accountable probability of such external events. The PSA level 1 and 2 studies and risk monitoring for actual configuration of the plant in all operational stages and for licensing of Limits and Conditions (TecSpecs) are required by Resolutions of Regulatory Authority (SUJB). Legal requirements for PRA methods application in the design, constuction and operation will be a part of harmonised legislation which will be issued by the year 2009.		

Q.No 76	Country	Article Article 14.1	Ref. in National Report page 63, 1st paragraph

Question/ Comment	In Level-1 PSA for PWR, one of the end states is defined as pressurized thermal shock (PTS)/ vessel cooling. In the PSA studies, whether this state has been treated as Core damage state or as stable state.
Answer	In the Temelin PSA, PTS conditions in the accident sequence have always been treated as the Core Damage state. If PTS conditions should occur during the accident sequence, a PSA study conservatively assumes that the core damage and probability of such sequence occurrence is given by the preceding sequence probability and the probability of human failure to recognize the PTS condition occurrence and to follow the corresponding EOP procedure for PTS condition mitigation. Such PTS conditions contribution to the total CDF is usually very limited, very small, in order of 1E-8/year.

Q.No	Country	Article	Ref. in National Report
77		Article 14.1	page 60, section 9.1.2/Last Para

Question/ Comment	It is mentioned that the EOPs were developed during 1994-98 and were verified and validated in 2000. What was the methodology adopted for the V & V of the EOPs, especially for managing DBA events for VVERs.
Answer	EOPs were verified and validated using INPO methodology. Plant specific verification and validation procedures were based on the following INPO Guidelines: INPO 83-004, EOPs Verification Guideline INPO 83-006, EOPs Validation Guideline

Q.No	Country	Article	Ref. in National Report
*		Article 14.1	

Question/ Comment	Section 9, Page 58 1) Kindly elaborate whether any comprehensive safety assessment report/ operational safety assessment report for NPP is issued within a specified time period? Who is responsible for preparing and approving the report? Is there any system for classifying the findings/ observations? Section 9.1.2, Page 61 2) Kindly indicate who is responsible for developing, verifying and validating the symptom based EOPs?
Answer	1) As comprehensive safety assessment reports we considered mainly 2 activities. Revisions of FSAR and Periodic Safety Review in accordance with IAEA NS G-2.10, which is elaborated every 10 years. FSAR is yearly updated and once every 10 years deep revisions are carried out in terms of verifying and updating all analyses that are included in FSAR. Utility is responsible for both activities. FSAR update is based on normal administrative procedure. PSR is usually carried out by a special expert team established for just that reason. FSAR updates are approved by the head of nuclear safety department and submitted to the Regulator (Regulator does not approve the document but merely takes it into consideration in the license renewal process). The final report on PSR is approved by the plant director and then submitted to the Regulator.

Both activities are license conditions. A methodology has been developed for safety importance classification of PSR findings. The methodology a combines probabilistic and deterministic approach and classifies findings into 4 groups of safety importance.

2) The operator decided to develop EOPs for both plants to fulfill all requirements and recommendations for Accident Management Programme implementation and Defend-in-Depth principles. Both plants (Dukovany in 1998 and Temelin in 2000) have already implemented EOPs. Plant specific EOPs are developed based on WOG generic ERGs and have been developed in cooperation with WEC engineers.

The Nuclear Safety Department is responsible for EOP development, verification, validation and maintenance. EOPs were developed in cooperation between Czech and WEC engineers. After EOPs are developed, they are verified and validated prior to their implementation. For both, verification and validation plant specific procedures based on the following INPO Guidelines have been developed:
INPO 83-004, EOPs Verification Guideline
INPO 83-006, EOPs Validation Guideline

EOP verification is performed in cooperation with the operational department. For EOP validation, the full scope simulator method and analyses methods were used. Initial EOP validation was performed prior to EOP implementation. Moreover, periodic validation is performed once any important change in EOPs is included or once the simulator model is significantly updated.

Finally, Temelin and Dukovany NPPs are involved in EOP’s maintenance programme with WEC, in which all relevant changes from generic ERGs are adopted into the plant-specific EOPs.

Q.No	Country	Article	Ref. in National Report
78		Article 14.1	12.1.2

Question/ Comment

The earthquake in Japan on 16 July 2007 showed that the NPP Kashiwazaki had been designed for a lower seismic intensity than actually occurred. The magnitude of Niigata Chuetsu-Oki earthquake was 6.8 on Richter scale, and it occurred with epicentre only 16 km from Tepco's Kashiwazaki Kariwa 7965 MWe nuclear power plant. The plant's seismometers measured PGA of 0.27 to 0.68g, the S1 design bases for different units being 0.17 to 0.27g and the S2 figure about 0.45g. The peak ground acceleration thus exceeded the S1 design values in all units - hence the need to shut down, and the S2 values in units 1, 2 and 4. The NPP Kashiwazaki went through the earthquake very well. While there were many incidents on site due to the earthquake, none threatened safety and the main reactor and turbine units were structurally unaffected. Analysis of primary cooling water confirmed that there was no damage to the fuel in reactor cores. The effects of that major earthquake were limited to a small spillage of slightly radioactive substances. However, the point is that the earthquake level was actually higher than the plant's rated capacity. The fault that caused the earthquake had not been considered a threat when the plant was being designed.
•Have Czech specialists analyzed lessons learned from that event regarding determination of seismic parameters for which the NPP should be designed?
•Specifically, can it be confirmed that the errors which had been done in choosing earthquake intensity level for Kashiwazaki are excluded in the seismicity studies

performed for NPPs in the Czech Republic?

Answer On the one hand, that event was assessed by both regulator and operator. On the other hand, no improvement needs were identified.

Temelin and Dukovany NPPs are located in a low seismicity area. Regarding the IAEA Safety Guide only, the seismic hazard was increased to the horizontal peak ground acceleration of 0.1 g (PGA SL2, hor = 0,1 g and PGA SL2, vert = 0,07 g).

Seismic design and seismic qualification are deeply evaluated in the process of periodic actualization of FSAR and PSR. In accordance with IAEA guide NS-G-3.3 three approaches were used: Seismostatistic -worked out in two versions using different input dates, Seismogeologic (seismotectonic) and Nonzonal based on Frankel studies. It was proven again that the factual value of PGA is noticeably below 0,1 g.

It could be mentioned that several IAEA missions were focused on this area. The site seismicity of Temelin NPP was one item which was discussed between Czech and Austrian experts within so called Melk and Brussel Process.

For example, the three-year project is planned for launching this year. This project will use up-to-date methods of geological and geophysical research, including paleoseismology, and should yield new input data for the assessment of seismogenic potential of near faults.

Q.No 79	Country	Article Article 14.2	Ref. in National Report p. 58-70, § 9

Question/ Comment Czech Republic gives a very comprehensive presentation of the PSA development and application (plant safety improvement, operating procedures, severe accident management, operating experience analysis). Could Czech Republic indicate the most important events when considering the probabilistic analysis (conditional CMF)?

Answer Assuming this question is focused on the Accident Sequence Precursor Program or similar analyses used at Temelin or Dukovany NPPs to estimate, using conditional CDP/LERP, the influence of various real events on CDF. Based upon operational experience, the worst case at Temelin NPP with thehighest impact on the CCDP was “Emergency Safety Feature System Actuation During a Transient Initiated by Spurious Generator Trip” event in February 2002 at Unit 1.

The CCDP, which represents a residual quantitatively-expressed safety margin remaining before core damage did not exceed 9,82E-6 from this event. Such conditional core damage probability being consistent with the unit state at the point of transient encompassed was still sufficient. “What if” analyses of this event indicated that CCDP would exceed 1E-4 when considering additional component failures within the accident sequence (failure of the last running auxiliary feedwater pump, various combinations of EFW trains failure, human error, etc.).

The other event in February 2003 was the LOSP during shutdown (Loss of 400 kV power supply when 110 kV backup line is OOS in planned maintenance during POS 13, lowered water level at the vessel flange, reactor open, RHR established by LHI pump, one train (second) of ECCS out of service, 1/5 DGs OOS) achieving CCDP

1.3E-5.

Other events analyzed were considered as having only lower importance in terms of their CCDP contribution and the event boundary conditions.

Q.No 80	Country	Article Article 14.2	Ref. in National Report 67 ff.
Question/ Comment	An exhaustive overview is given regarding the Components life monitoring programme. We would appreciate more information on the monitoring of aging of electrical and I&C equipment and the tools used for monitoring these equipment.		
Answer	A complex monitoring programme for safety I&C equipment (SSS – reliability monitoring system) is already implemented. This programme will also be spread for relevant safety electrical equipment. The safety important cables are in deposit close to the main primary pipelines and are periodically tested. Ageing of the electrical and I&C penetrations is also monitored and tested.		

Q.No 81	Country	Article Article 14.2	Ref. in National Report 9.1
Question/ Comment	Control rod insertion reliability has been poor in Temelin NPP, including the case on June 02, 2006, when two cluster assemblies stopped above the hydraulic dampers and thus failed to meet the Limit Conditions (which have to be fulfilled at all times during operation). This had been identified as safety issue for WWER-1000/320 NPPs in the early 1990s by the IAEA, and now appears to be a safety problem at Temelin NPP. The failure of control rods to insert can result in a transient without scram. In spite of that, operation of Temelin is continued, with permission of the Czech Nuclear Safety Authority. This gives raise to several questions: •Did the failure of the rods on June 02, 2006 exceed the limits of safe operation foreseen in the Temelin NPP license? •Have there been analyses indicating what can be further developments of safety rod deflections and failures as the burnup of the core increases? •Does the safety report include Anticipated Transients Without Scram (ATWS)? If yes, in which category of frequency? The actual situation in the plant results in a high probability of ATWS. Does it still remain within bounds of the safety report?		
Answer	1) IRI case on June 2, 2006 exceeded the limiting condition and operation was immediately stopped. The unit was shutdown for outage. Although the limiting condition for operation was exceeded, the past operation analysis (evaluation) confirmed that the reactor’s operation safety was still assured. 2) No safety control rod deflection or failure was ever observed. The conservative methods for IRI evolution prediction was developed and applied during subsequent cycles. Technical means were taken to asses safety consequences of IRI, to follow real IRI extent and to mitigate the IRI root cause. The evaluation of IRI impact to safety analyses was done immediately after the problem was indicated. The methodology applied for the determination of safety analyses IRI effects ensures that conservative assumptions are applied. This, in turn, establishes the minimum SDM requirement that must be satisfied for this condition to maintain that the safety analyses criteria are met. Very conservative conditions are considered when evaluating the IRI RCCA patterns to ensure conservatism in establishing the Shutdown Margin (SDM) requirements and conservatively assure the validity of the safety analyses.		

Based on past RCCA SCRAM tests and inspection information, Westinghouse has determined that the onset and locations of incomplete RCCA insertion (IRI) are dependent on key characteristics of the fuel and its irradiation history (burnup, design, previous cycle core location, etc.). From this data, Westinghouse has gained sufficient experience to identify probable IRI configurations. The assumptions on IRI configuration are further verified by periodic RCCA drop tests. If the RCCA drop tests show that operation with IRI can no be longer supported by conservative safety analyses, the unit is shut down (which was the case of June 2, 2006).
In the area of core design, one of the important core design intents is the effort to put fresh fuel under the RCCAs. As fresh fuel is modified fuel (fuel assemblies with increased lateral stiffness), this is the main contributor for improving RCCA behavior. Thus there is no specific limitation for fuel burnup because of IRI for any fuel in the core, but a rather maximization of fresh fuel under RCCAs and a shorter cycle length planning if necessary.

Operational counter measures are focused on frequent drop tests and their evaluation, including a prediction for upcoming operation. Reduced power operation is not an efficient measure.

A drop test interval is based on past experience, test data evaluation and safety evaluation assumption and is subject to regulatory body concurrence. In addition to drop test measurements, the RCCA's lifting force measurements after each refueling are performed as well. The evaluated data serves as the supplemental information for RCCA behavior trending but the data have no fundamental significance.

Conclusion: After June 2, 2006 there was no case of limiting condition for safe operation violation. There was no IRI observed during current cycles.

3) Safety report ch.15 FSAR does not include ATWS. It includes Diverse protection system analyses in chapter 15.8. of FSAR.
Anticipated Transients Without Scram (ATWS) were performed (documented in TEM-IC-DPS-030) as the scoping studies for the design of Diverse Protection System and were not required to be documented in ch.15 FSAR due to the fact that Temelin has a Diverse Protection System.

Q.No 82	Country	Article Article 14.2	Ref. in National Report Page 69
Question/ Comment	The report states that the inner reactor was verified using accelerated in-pile experiments. What examination and measurements are made during the ageing of the internals to verify the ageing predicted by the accelerated in-pile measurements?		
Answer	A complex and detailed examination and measurement is made to verify the status of the reactor vessel. For the inner part of reactor an indirect visual test is carried out on the core basket and barrel with the period of 1 x 8 years.		

Q.No 83	Country	Article Article 15	Ref. in National Report 11.1.1
Question/ Comment	The report states that SUJB establishes an emergency planning zone, based on the licensee request. Could you explain a little bit more ?		
Answer	1) The licensee for siting, construction or operation of nuclear facility or workplace with a very important source of ionizing radiation (hereinafter referred to as the		

"licensee") shall submit a proposal for the establishment of an emergency planning zone to the State Office for Nuclear Safety if radiation accident with probability of occurrence greater than or equal to 10-7/year cannot be eliminated with such licensee.

(2) The proposal for establishment of emergency planning zone shall contain the following:

a) List of possible radiation accidents with probability of occurrence during operation of the nuclear facility or workplace with a very important source of ionizing radiation greater than or equal to 10-7/year,

b) Description of expected development and course of single radiation accidents taken into account according to letter a). This description shall be supported by a calculation, on the basis of which it is possible to identify the probable place at the nuclear facility or workplace with a very important source of ionizing radiation, where expected inadmissible release of radionuclides or ionizing radiation could occur during the radiation accident in question, as well as a determination of time course of radiation accident, time course of release of radionuclides and ionizing radiation, list of released radionuclides and estimate of their activity including the impact of meteorological conditions on the propagation of radionuclides in the vicinity of the installation in question,

c) List of possible consequences of radiation accidents prepared in connection to the calculation according to letter b) including assessment of the possibility of inadmissible population exposure and consequences of such exposure, assessment of the possibility to exceed the guide values for prompt protective measures,

d) Geographical definition of a proposal for emergency planning zone size.

Q.No 84	Country	Article Article 15	Ref. in National Report p. 75-76, § Optimization in radiation pr
Question/ Comment	Could Czech Republic provide further information regarding optimisation in radiation protection?Could Czech Republic explain what are the actions taken to reduce the doses to workers? Could Czech Republic provide their results on the collective and individual doses to workers? At page 76, the report states that " A reasonably achievable level …to optimize radiation protection".Could Czech Republic develop and clarify this paragraph? Could Czech Republic give information about their ALARA program?		
Answer	COULD THE CZECH REPUBLIC PROVIDE FURTHER INFORMATION REGARDING OPTIMISATION IN RADIATION PROTECTION?		

The principle of optimization is incorporated into Czech legislation, the Atomic Act, where is stated in Section No. 4:

"Whoever utilizes 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 organizational 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 paragraph is more developed in implementing legislative procedure, the SUJB Decree No. 307/2002 Coll., as amended by the SUJB Decree 499/2005 Coll., where is stated in the Section 17:

"(1) The optimization of radiation protection shall be performed:

a) in advance of a commencement of radiation practices by assessing and comparing with radiation protection variants which for the intended activities should be taken into consideration, by assessing necessary costs for the appropriate remedial measures, and by assessing collective doses and doses in appropriate critical groups of the public;

b) during radiation practices by a regular analysis of doses received in respect of working operations, by taking into account all possible other measures to ensure radiation protection, and by comparing with similar already practiced and socially acceptable activities;

c) in advance of the commencement of any intervention to avert or reduce exposure by assessing all possible variants and by selecting such a variant which with its method of performance, scope and duration shall bring the most net benefit; and

d) during implementing intervention by the analysis of doses received in relation to the countermeasures being performed and by considering of a possible change of selected countermeasures and procedures.

(2) As a part of the optimization of radiation protection, all exposures shall be planned and kept as low as reasonably achievable, taking into account economic and social factors. The variants of radiation protection assessed as a part of the optimization of radiation protection shall not lead to exposure which exceeds the exposure limits or the dose constraints if these limits and dose constraints are laid down for this case. If dose constraints for particular radiation practices or a particular ionizing radiation source are to be set out, the SÚJB (State Office for Nuclear Safety) shall take into account all existing experience of similar radiation practices and handling of the sources so that the level of radiation protection shall not be lower than achieved in practice thus far, and the SÚJB shall also consider a possible effect of the other activities and sources to avoid exceeding the limit.

(3) While optimizing radiation protection, the costs of different remedial measures to improve radiation protection, for example, a relocation of individuals or a construction of additional barriers, etc., shall be usually compared with a financial appraisal of expected exposure reduction (hereinafter referred to as "the benefits of remedial measures"). A reasonably achievable level of radiation protection shall be considered to be proven and the remedial measures need not be implemented if the

costs are higher than the benefits of such remedial measures and if implementation of the remedial measures does not require special social conditions. The benefits of remedial measures shall be calculated in such a way that a reduction of collective effective dose for a group of individuals being assessed shall be multiplied by a factor of:

a) 0.5 million CZK / Sv for radiation activities when an average effective dose to individuals shall not exceed one tenth of appropriate exposure limits;

b) 1 million CZK / Sv for radiation activities when an average effective dose to individuals shall exceed one tenth of appropriate exposure limits but not three tenths of the appropriate exposure limits;

c) 2.5 million CZK / Sv for radiation activities when an average effective dose to individuals shall exceed three tenths of appropriate exposure limits;

d) 1 million CZK / Sv for medical exposures;

e) 0.5 million CZK / Sv for the exposure to natural radionuclides which are not intentionally utilized; and

f) 2.5 million CZK / Sv for emergency exposure.

(4) A reasonably achievable level of radiation protection shall be also considered to be sufficiently proven if an annual effective dose of the exposed workers arising from a certain radiation activity does not exceed 1 mSv for each exposed worker even for predictable deviations from normal operation, and an annual effective dose to the public does not exceed 50 microSv for each individual, and a collective effective dose at a category IV workplace does not exceed 1 Sv. In such cases, it is not necessary to optimize radiation protection in accordance with paragraph 3.

(5) 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 programme."
Optimization techniques are incorporated into radiation protection chapters of the technological process handbook of the supplier organizations. Each supplier organization performing radiation works within controlled areas at the Czech nuclear power plants should have either a Radiation protection programme or a Technological process handbook with a chapter related to radiation protection. Thus the optimization process is implemented directly from papers to the practice.

COULD THE CZECH REPUBLIC EXPLAIN WHAT ARE THE ACTIONS TAKEN TO REDUCE THE DOSES TO WORKERS?
The actions focused on worker's doses reduction can be divided into three main areas:

1. Objective cause:

• Design layout.

More free space in the primary part of the VVER units. This is a generic feature of the VVERs. Thus, a close contact of the workers with components of the primary circuit inside primary part at the VVERs does not result.
Lower power charge of the fuel save the integrity of the fuel cladding at the VVERs.

• Construction materials.
Corrosion resistant material of the nuclear fuel cladding creates a small source for primary circuit contamination.
Low content of cobalt is the cause of low contamination of primary circuit surfaces by the Co-60. This fact is a very significant reason of the low doses at the Czech nuclear plants.

2. Specific cause influenced by state regulation:

• Legislation
Legislation should ensure advantages of the design layout. The Czech legislation includes conditions of low cobalt content in construction materials maintainence.
Legislation should encourage good practice consolidation in radiation protection.

• Operational safety culture.
A low number of the scrams means a low likelihood of corrosion products transfering along the primary circuit, thus increasing exposure to the radiation workers.
Low number of the events means low additional exposures.

• Well-thought-out system of radiological monitoring.
As a strong radiation protection tool, tadiation monitoring at the Czech nuclear power plants uses a system of well-thought-out units as authorized limits. These values are derived from Czech legislation as well as from both national and international good practice.
Reference levels of normal monitoring continuously merge into emergency monitoring.

• Effective radiological event feedback.
Radiological event feedback setting up is a statutory duty of the licensee. The State Office for Nuclear Safety supervises activities of the licensee’s event feedback committees.
State Office for Nuclear Safety operates its own independent event feedback commission. Both commissions (licensee’s and regulator’s) are involved in actions reducing doses at the Czech nuclear power plants.

• Effective education and training.
Education and training is a statutory duty as well. The Czech regulator supervises over the quality and effectiveness of that item.

3. Specific causes uninfluenced by state regulation:

• Modified water chemistry of the primary circuit adopted by the licensee. The original method of the primary water chemistry treatment was based on the project. The high-temperature pH value was rolling with decreased concentration of the

boric acid from 6.8 to 7.6. The improved attitude is based on the knowledge that no transfer of corrosion products along the primary circuit is possible only under condition of a constant pH value of 7.2.

• Licensee's system of radiation work debriefing. This is a very strong tool mainly for the supplier organization personnel. This tool provides assessment of each radiation work from the point of view of the planned both individual and collective doses fulfillment. Thus the radiation protection programmes undergo their feedback ways.

The first area "Objective cause" includes, from the perspective of the state regulator, quite uninfluenced items related to the dose creation. The Czech Republic's good results in the field of radiation protection assurance are ensured, among other things, by the design layout as well. A general arrangement and a selection of the construction materials play a basic role for the creation of doses. The low content of cobalt in the construction materials has been ensured by a project and that advantage is strengthened by the statutory duty. The Czech legislation plays a significant role in the field of the actions reducing doses to the radiation workers. Practically all the second area "Specific cause influenced by the state regulation" is determined by the legislation. Statutory duties are transformed to the technical plans and technological processes controlling radiation behavior within the controlled area. Very specific is the third area, which is legislatively effect free. However, that area is dependent upon the decision making system of the licensee, and there is a weak linkage to the legislation between licensee and regulator thus, as well.

COULD THE CZECH REPUBLIC PROVIDE THEIR RESULTS ON THE COLLECTIVE AND INDIVIDUAL DOSES TO WORKERS?

These results are shown for Dukovany NPP in Figures 1, 2, and for Temelín NPP in Figures 3 and 4 in Annex .

AT PAGE 76, THE REPORT STATES THAT "A REASONABLY ACHIEVABLE LEVEL …TO OPTIMIZE RADIATION PROTECTION". COULD THE CZECH REPUBLIC DEVELOP AND CLARIFY THIS PARAGRAPH?

Explanation is given above:

"(1) The optimization of radiation protection shall be performed:

a) in advance of a commencement of radiation practices by assessing and comparing with radiation protection variants which for the intended activities should be taken into consideration, by assessing necessary costs for the appropriate remedial measures, and by assessing collective doses and doses in appropriate critical groups of the public;

b) during radiation practices by a regular analysis of doses received in respect of working operations, by taking into account all possible other measures to ensure radiation protection, and by comparing with similar already practiced and socially acceptable activities;

c) in advance of the commencement of any intervention to avert or reduce exposure by assessing all possible variants and by selecting such a variant which with its method of performance, scope and duration shall bring the most net benefit; and

d) during implementing intervention by the analysis of doses received in relation to the countermeasures being performed and by considering of a possible change of selected countermeasures and procedures.

(2) As a part of the optimization of radiation protection, all exposures shall be planned and kept as low as reasonably achievable, taking into account economic and social factors. The variants of radiation protection assessed as a part of the optimization of radiation protection shall not lead to exposure which exceeds the exposure limits or the dose constraints if these limits and dose constraints are laid down for this case. If dose constraints for particular radiation practices or a particular ionizing radiation source are to be set out, the SÚJB (State Office for Nuclear Safety) shall take into account all existing experience of similar radiation practices and handling of the sources so that the level of radiation protection shall not be lower than achieved in practice thus far, and the SÚJB shall also consider a possible effect of the other activities and sources to avoid exceeding the limit.

(3) While optimizing radiation protection, the costs of different remedial measures to improve radiation protection, for example, a relocation of individuals or a construction of additional barriers, etc., shall be usually compared with a financial appraisal of expected exposure reduction (hereinafter referred to as “the benefits of remedial measures”). A reasonably achievable level of radiation protection shall be considered to be proven and the remedial measures need not be implemented if the costs are higher than the benefits of such remedial measures and if implementation of the remedial measures does not require special social conditions. The benefits of remedial measures shall be calculated in such a way that a reduction of collective effective dose for a group of individuals being assessed shall be multiplied by a factor of:

a) 0.5 million CZK / Sv for radiation activities when an average effective dose to individuals shall not exceed one tenth of appropriate exposure limits;

b) 1 million CZK / Sv for radiation activities when an average effective dose to individuals shall exceed one tenth of appropriate exposure limits but not three tenths of the appropriate exposure limits;

c) 2.5 million CZK / Sv for radiation activities when an average effective dose to individuals shall exceed three tenths of appropriate exposure limits;

d) 1 million CZK / Sv for medical exposures;

e) 0.5 million CZK / Sv for the exposure to natural radionuclides which are not intentionally utilized; and

f) 2.5 million CZK / Sv for emergency exposure.”

In the case of having less then 1 mSv for each exposed worker per year under

conditions providing radiation works, it is not necessary to undergo the above explained way of the optimization calculations. Unless provided otherwise according to the section 17 of the decree No. 307/2002 Coll., in special cases enumerated in that paragraph:

“A reasonably achievable level of radiation protection shall be also considered to be sufficiently proven if an annual effective dose of the exposed workers arising from a certain radiation activity does not exceed 1 mSv for each exposed worker even for predictable deviations from normal operation, and an annual effective dose to the public does not exceed 50 microSv for each individual, and a collective effective dose at a category IV workplace does not exceed 1 Sv. In such cases, it is not necessary to optimize radiation protection in accordance with paragraph 3.”
it should be proceeded paragraph 3 (1 and 2), accordingly. It means to use full way of optimization. Keeping conditions in paragraph 4, it is not needed to use full way of optimization.

COULD THE CZECH REPUBLIC GIVE INFORMATION ABOUT THEIR ALARA PROGRAM?
There are as many ALARA programmes as there are so called “radiation” organizations in the Czech Republic. It is not possible to state one general ALARA programme. Generally speaking, each organization with its exposed workers should have its specific ALARA programme focused on the specific radiation activity. These programmes are assessed during inspections of the inspectors of the State Office for Nuclear Safety. Calculations are provided in accordance with ALARA Manual of the European Union: P. J. Stokell, J. R. Croft, J. Lochard, J. Lombard , ALARA From Theory towards Practice, Radiation Protection, Commission of the European Communities, Final Report, Directorate-General, Science, Research and Development, Brussels, Luxemburk, 1991.

Support Documents: » Czech Republic - Annex to Answer No. 54

Q.No	Country	Article	Ref. in National Report
85		Article 15	p. 76 § radiation monitoring in the vici

Question/ Comment: Could Czech Republic provide the values of authorised limits for gaseous and liquid releases?
Could Czech Republic indicate which nuclides are measured ?

Answer: Authorized limits are as follows:
Gaseous releases:
Dukovany NPP 40 microSv per capita and year for individual from critical group (40 microSv/year) 1996 up to now.
Limits were listed originally as annual activities, 1986 - 1996:
Radioactive Noble Gases < 4.1 x 1015 Bq/year
Aerosols < 1.8 x 1011 Bq/year
Iodines < 4.4 x 1011 Bq/year
89Sr + 90Sr < 5.7 x 108 Bq/year
The sum of these radionuclides basically creates above mentioned dose 40 microSv/year. Activities are solely converted to the doses after 1996. This attitude is corresponding to the Czech legislation. The Czech legislation was fully changed only in 1997.

Temelín NPP 40 microSv per capita and year for individual from critical group (40 microSv/year)
Temelín NPP is a quite new facility and since the beginning of its operation (2000) has used only doses instead of activities operating under conditions of the changed legislation.
Airborne radionuclides are measured as follows:
The sum of so called radioactive noble gases, actually only 133Xe a 135Xe with respect to the project (historical reason), sum of iodines (the same reasons – project and operational history), aerosols (110mAg, 54Mn, 95Zr, 95Nb, 58Co, 60Co, 134Cs, 137Cs, 144Ce, 76As, 140La, 106Ru, 124Sb, 51Cr, 89Sr, 90Sr), tritium, 14C, 41Ar, 88Kr, 87Kr, 85mKr, 138Xe.
Liquid releases:
Dukovany NPP 6 microSv per capita and year for individual from critical group (6 microSv/year).
Limits were listed originally as annual activities, 1986 - 1996:
Corrosion and fission products < 2.0 x 109 Bq/year
Tritium < 22 x 1012 Bq/year
Temelín NPP 3 microSv per capita and year for individual from critical group (3 microSv/year).
Waterborne radionuclides are measured as follows:
Tritium, 58Co, 60Co, 51Cr, 54Mn, 110mAg, 124Sb, 134Cs, 137Cs.

Q.No 86	Country	Article Article 15	Ref. in National Report Annex 6 Graphs I – 4.A.1, 4.A.2 and 4.A.

Question/ Comment: In the report the graphs referred to above show doses for Dukovany (Graphs I) and Temelin (Graphs II). These show very considerable differences between doses incurred by contractors and by employees of the NPP: Collective Effective Dose varies from 4 to 10 times as much for Contractors; Specific Collective Dose per Capita varies from 2 to 4 times as much; and Maximum Individual Effective Dose varies from 2 to 6 times as much. These ratios do not appear to be improving with time. What dose reduction programmes exist in the NPPs? Does the licensee have a specific plan to reduce the dose to Contractors? How does the regulator ensure that doses are ALARA and that doses are not being exported from employees to contractors?

Answer: Ratio CED (Collective Effective Dose) and ratio IED (Individual Effective Dose) ¡§employees of the NPP vs. contractors¡¨ are fully correct. It is logical that contractors have increasingly doses higher than employees of the NPP. CEZ company is in the process of outsourcing original employees of the NPP to contractors. This ratio is absolutely non-predicative.

This process is moreover influenced by:
- Length of outage + number of outages during the year
- Character of work during outage ¡V the highest influence has a scope of work on reactor, number of INCORE instrumentation liquidation and scope of required decontamination
- Time demand of contractors´ work

In both NPPs the ALARA principle for all activities is implemented. So-called "radiation work management" includes:

- Everyday checking of KED and IED during work performance with a higher radiation risk
- Electronics work R-orders (work permit in the environment with higher radiation risk) and using an electronic dosimeter system
- Using different levels of operation radiation protection ¡V permitted surface contamination and a regulated approach to different rooms according to the actual radiation situation
- Adequate housekeeping

It is necessary to take into account that in the period of 2005 ¡V 2007 the trend of IED went down. But the most important fact is that KED, for employees of the NPP and contractors as well, is very low for the whole period of NPPs operation - from the beginning. KED of CEZ PWR is kept on the lowest world level. As for supporting material you may look at the 16th Annual Report of the ISOE Programme, 2006, Occupational Exposures at NPP.

Similar information about Radiation protection assurance of Dukovany and Temelin NPP were presented during the ISOE conference in Essen: (http://www.isoe-network.net/index.php?option=com_docman&task=cat_view&gid=140&Itemid=48)

Q.No 87	Country	Article Article 16.1	Ref. in National Report pg 95
Question/ Comment	For the period covered by this report, what were the statistics for the informational campaign organised by the Regional Authorities? Who is responsible for covering the costs of these campaigns?		
Answer	As far as the informational campaign was concerned, CEZ covers: Distribution of common Emergency Preparedness information in the form of a calendar (every two years 1.2 mil Crowns). Cost and distribution of antidotes in the Emergency zones of Temelin and Dukovany (every 5 years - 5 mil Crowns) + information leaflet. Maintenance of sirens in the Emergency zones (2.5 mil Crowns each years) Periodical journal in the Emergency zones including all information of activities around NPP (aprox 2 mil crowns per years) CEZ also supports technological and meteorological data loading etc.		

Q.No 88	Country	Article Article 16.1	Ref. in National Report Chapter 11
Question/ Comment	Thank You for indeed very comprehensive and nicely prepared Report. Still we would like to ask, what approach is used in Czech Republic for assessment and management of design basis and severe accidents in terms of radiological safety criteria or safety goals?		
Answer	Although the legislation does not specify so, CEZ has determined, on the basis of criterion analyses, limits and goals for abnormal operation and emergency conditions discussed with the SÚJB.		

	The following levels of values are set: ZBC – basic safety goal, ZBL – basic safety limit, KP – acceptability criterion The counted doses during analyses must be below the limits for abnormal operation or emergency conditions while taking account of events involving a generated increase in iodine concentration (iodine peak) and equilibrium iodine concentration in continuing full load, and while taking account of actual activity in primary and secondary coolant.

Q.No 89	Country	Article Article 16.1	Ref. in National Report Page 92
Question/ Comment	The report states that the respective Fire and Rescue Services draw up off-site emergency plans. What powers do the Fire and Rescue Services have to ensure the co-operation of all the interested parties, including utilities, hospitals, police, government departments and adjacent local authorities in drawing up these plans?		
Answer	Developing of external emergency plans is based on data from application for a permit, permit holder and partial bases from relevant regional athorities, their bodies and municipalities. Regional Fire Rescue Service is, for purposes of developing of external emergency plans, obliged to use, collect and file data from regional crisis plans (data security is inevitable). Regional Fire Rescue Service organizes cooperation among administrative authorities and municipalities in the region and is also entitled (to be ready for crisis situations) to require, collect and file data mentioned in special legal act.		

Q.No 90	Country	Article Article 16.1	Ref. in National Report Pages 96 and 97
Question/ Comment	The report states that emergency exercises are evaluated and were successful. How were the evaluations carried out? Were there changes to plans, equipment, procedures etc. as a result of the evaluations?		
Answer	Each emergency exercise has its objectives and a scenario prepared in advance. Each emergency exercise has also its evaluators which are nominated well in advance; these evaluators are prepared (trained) for their mission at the exercise. After each exercise a protocol is written in which a part contains the list of observations made by the evaluators. Whenever an observation means any discrepancy with the respective procedure(s), the method of its removal is determined at the evalution meeting which is held shortly after the exercise. Some of these findings imply the changes both in intervention instructions and in the on-site emergency plan. The changes in the plan shall be re-approved by the authority (State Office for Nuclear Safety).		

Q.No *	Country	Article Article 16.2	Ref. in National Report Section 11.1.2, Page 92
Question/ Comment	Kindly highlight the international arrangements that are in place with neighboring countries like Slovakia and Austria etc?		
Answer	The Czech Republic has concluded “information and cooperation agreements” with all neighboring states. They are primarily focused on information exchange in case of a nuclear event situation but they also regulate an information exchange in the		

"non-event" stage. They were concluded on the government-to-government level and their texts are available on the SUJB webpage.

In the case of Slovakia, in addition to such agreement in force there is an extensive informal cooperation on all levels between regulatory bodies and NPPs.

In the case of Austria, such agreement is complemented by the political "Melk Agreement" (for the text see SUJB webpage) signed by the prime ministers and three arrangements on regulator – regulator level. They define the conditions of an information exchange in a very detailed way: information on events of low- or no-nuclear safety importance (INES levels 0 and 1) and on the exchange of data from radiation monitoring stations and networks and data for codes used in the assessment of possible emergency situations.

Q.No *	Country	Article Article 17.1	Ref. in National Report Section 121.2.1, Page 100 & section 12.

Question/ Comment: Please provide the magnitude of Safe Shutdown Earthquake SSE for Dukovany & Temelin NPPs?

Answer: Temelin and Dukovany NPPs are located in a low seismicity area. Regarding the IAEA Safety Guide only, the seismic hazard was increased to the horizontal peak ground acceleration of 0.1 g (PGA SL2, hor = 0,1 g and PGA SL2, vert = 0,07 g).

Seismic design and seismic qualification are deeply evaluated in the process of periodic actualization of FSAR and PSR. In accordance with IAEA guide NS-G-3.3 three approaches were used: Seismostatistic -worked out in two versions using different input dates, Seismogeologic (seismotectonic) and Non- zonal based on Frankel studies. It was proven again that the factual value of PGA is noticeably below 0,1 g.

Q.No 91	Country	Article Article 18.1	Ref. in National Report

Question/ Comment: What is your national policy concerning need for Severe Acci-dent Management (SAM) procedures or back-fitting measures at operating facilities, aiming to protect the reactor containment integrity after a possible severe core damage? Are SAM proce-dures in place at the operating nuclear power plants? Has back-fitting been completed that addresses all physical phenomena, which might endanger containment integrity?

Answer: Current existing Czech legislative does not directly require implantation of SAM. However, licensing approval for plant operation issued by the state regulatory authority contains a condition requiring implementation and maintenance of state-of-the-art SAMG .

The operator decided to develop SAMG for both plants to fulfill all requirements and recommendations for Accident Management Programme implementation and Defend-in-Depth principles. Both plants (Dukovany in 2003 and Temelin in 2004) have already implemented SAMG. Plant specific SAMG were developed based on WOG generic SAMG and they have been developed in cooperation with WEC engineers.

Note that EOPs had previously been implemented at both plants and had also been

developed based on WOG ERGs.

For the SAMG development purpose, all physical phenomena which might endanger containment integrity and corresponding risks were assessed using PSA study level 1 and level 2. Consequently, many deterministic analyses of severe accident sequences (identified in PSA study) were performed. SAMG addresses all significant phenomena and risks that have been identified and the strategies are supported by the results of performed analyses.

Q.No 92	Country	Article Article 18.2	Ref. in National Report
Question/ Comment	Have you met specific problems to find spare parts or replace-ment components properly qualified to a high safety class, as needed for plant lifetime management? If yes, how have you addressed the problem?		
Answer	All high safety class components have to be properly qualified. Only qualified spare parts or replacement components can be used. If there is a lack of such parts it is necessary to go through a formal procedure of Configuration Management and define the requirements for a qualified equivalent and developed and then to buy so called approved equivalent.		

Q.No 93	Country	Article Article 19.1	Ref. in National Report Page 116
Question/ Comment	The report states that individual stages of commissioning are subject to authorisation and many aspects of regulation come into force. What powers does the regulator have to assure nuclear safety in the period from when fuel is received on site and before the commencement of commissioning? Are emergency plans operable at this stage?		
Answer	During the period mentioned, the regulator has the same power and competence as in the other stage of nuclear fuel utilization described in chapter 3.1.1 of the Report. The SUJB issues a license on the storage and transport/storage containers (prior to transport and storing) and has the right to inspect the storage to check fulfillment of license conditions. In the case of non-compliance, SUJB has the power to order remedies and force the operator to perform it. A possible event during the mentioned period is included in NPP emergency plans. New fuel (after being delivered and received on site) is stored under dry conditions at the new fuel receipt facility. Onsite Inspection is performed. Specified procedures are used for the post-shipment inspection of the new fuel assemblies and reactivity control and source components. Fuel handling procedures specify the sequence in which handling and inspection take place. Loaded fuel containers, when received onsite, are externally inspected to confirm that labels and markings are intact and security seals are unbroken. After the containers are opened, the shock indicators attached to the suspended internals are inspected to determine whether movement during transit exceeded design limitations. Emergency plans must be operable at any time. They are based on performed bounding analysis. The subcriticality requirements are met (according to SUJB Decree No. 195/1999 Coll., Section 46 Fresh Nuclear Fuel Handling and Its Storage „.. to prevent exceeding the 0.95 value of effective coefficient of multiplication of neutrons under		

the assumed accident situations (including flooding by water), and the exceeding the 0.98 value of effective coefficient of multiplication of neutrons under the conditions of optimum moderation).
Analyses were performed for all reasonable (foreseeable) conditions (assuming unborated water and fuel at the highest anticipated enrichment of 4.6 w/o U 235 containing no Integral Fuel Burnable Absorbers -IFBA). At the same time the ANSI/ANS 57.3 limits are satisfied ("Design Requirements for New Fuel Storage Facilities at Light Water Reactor Plants," ANSI/ANS 57.3-1983, January 13, 1983).
Admissible analyses were performed only by verified codes (databases, libraries, correlations), accepted for these purposes by the SÚJB based on evaluation processes in the technical experts committees.
The plan of fresh fuel tests and inspections provides an adequate guarantee that the design tolerances are observed. The general features of examinations and tests for irradiated fuel, together with radiation monitoring of the primary coolant, represent a basis for detecting any anomalies or confirming the anticipated fuel behavior.
Inspection and Testing program (including inspections of non-irradiated fuel, inspection of fuel system components and parts, fuel rods and assemblies) includes Quality Assurance Program. The requirement was that it should provide control over activities affecting product quality, commencing with design and development and continuing through procurement, materials handling, fabrication, testing and inspection, storage, and transportation.

According to the Atomic Act Section 39, paragraph 4, letter a) "Inspectors, under the framework of their inspecting activities, and the Office director are authorised, apart from rights ensuing separate law, to anytime enter premises, equipment and other workplaces of inspected persons where activities related to nuclear energy utilization or practices resulting in exposure take place" including New Fuel Storage. Thus we can perform inspections on site at any time and "inspect an adherence to requirements and conditions of nuclear safety, radiation protection, physical protection and emergency preparedness..." (Atomic Act Section 39, paragraph 4, letter b). Physical protection is ensured.

Q.No 94	Country	Article Article 19.3	Ref. in National Report
Question/ Comment	What criteria are used to determine the lifetime of the plant.		
Answer	In the Czech Republic there is an unlimited licence for the operation of an NPP. An NPP must fulfill the conditions of SUJB (State Office of Nuclear Safety) and normally will get operational permission for each separate unit for each 10 years. The original lifetime of the most important components was between 30 and 40 years. That is why it is necessary to demonstrate relevant AMPs, residual lifetime and complying TLAAs of those components in the case of longer operation. The final target lifetime of each unit is based on technical – economic study of optimum operation.		

Q.No 95	Country	Article Article 19.3	Ref. in National Report
Question/ Comment	Do you have long term operation strategy or plans to operate the NPPs beyond design lifetime.		
Answer	CEZ is preparing LTO (Long Term Operation) Programme for operation of NPP		

beyond an original designed lifetime – for 40 to 60 years of operation. The feasibility study for operation for 40 to 60 years was finished in September 2007.

The strategy of LTO was already approved and submitted to SUJB in December 2007. The LTO Programme will be finished by September 2008, then will be approved by CEZ management and submitted to SUJB. The implementation of this Programme will start from January 2009.

Q.No 96	Country	Article Article 19.3	Ref. in National Report
Question/ Comment	Do you have a re-qualification program for components to be used beyond their design lifetime.		
Answer	A re-qualification of components beyond their original design lifetime will be carried out within the LTO Programme. The part of the LTO Programme are programmes like Equipment Qualification, revalidation of TLAAs etc.		

Q.No 97	Country	Article Article 19.3	Ref. in National Report 14.1.3, p.123, 124
Question/ Comment	During the operation of the units and during regular refuelling outages, the Dukovany NPP and Temelín NPP operating personnel perform regular tests of the equipment. The tests are controlled by independent control workers and by responsible managers Q: Who are the independent workers? Are they CEZ company employees or not?		
Answer	These independent workers are personnel of the Safety Section in CEZ Company. The Safety Section is independent to the Plant Production – generation of electricity.		

Q.No 98	Country	Article Article 19.3	Ref. in National Report 14.1.3, p.120
Question/ Comment	In the Dukovany NPP as well as in the Temelín NPP a system of WANO safety indicators evaluation is implemented, continuously providing information about the standard in the monitored areas in other NPPs in the world. Gathered information is used to recognise own level of the Dukovany NPP and the Temelín NPP in the individual indicators of the safety and operational status. SÚJB uses the set of safety indicators to assess the nuclear safety level. The results of the safety indicators for 2001 – 2006 and for Dukovany NPP as well as Temelín NPP are shown in Annex 6. Q: Are the reports to WANO open to the regulatory body? If the assessment of the safety indicators is based on the WANO document is there any other information necessary?		
Answer	The WANO reports are not open to regulatory body. Regulatory body is informed about the results by way of the Licensee. SUJB has not used the results of the Safety performance indicators for comparison of the sites, not in the least for comparison with Units in abroad.		

Q.No 99	Country	Article Article 19.3	Ref. in National Report Page 124
Question/ Comment	The report states that during operation and outages, tests are carried out either by plant personnel or by suppliers' employees. How does the regulator ensure that the licensee has, and take steps to retain, adequate capability within its own organisation to understand the nuclear safety requirements of all of its activities relevant to safety		

and not delegate to support organisations responsibilities which are properly those of the licensee?

Answer

The activity carried out with the licensee by the supplier's personnel is considered to be one of the operational states with potential risks. Therefore, great attention is given to the observance of requirements, rules and principles applicable to the consumer's as well as supplier's personnel when performing their supply activities.

The SÚJB approves the Quality Assurance Programme of the responsible organization for activities permitted according to the Atomic Act. The Programme describes the established quality system for all activities executed within the licensee. The quality system represents an interlinked system of control and working documentation laying down, among others, requirements on the control of supply activities and responsibilities of the supplier's personnel as well as the licensee's personnel in all implementation phases of a particular activity including inspection of the supplier's activity.

The inspection activity of SÚJB includes an inspection of the fulfillment of procedures and activities during inspections aimed at observing the established quality system and adequate participation in inspections carried out by supply organizations.

Q.No 100	Country	Article Article 19.4	Ref. in National Report page 61

Question/ Comment

1. SAMGs are implement at both NPPs. Are the development of guidelines based on regulatory requirement?

Answer

This is based on regulatory decisions. Currently existing Czech legislative does not directly require the implementation of SAMG. However, the licensing approval for plant operation issued by state regulatory authority contains a condition requiring implementation and maintenance of state-of-the-art SAMG .

For additional information please look at the answer to question given by Finland under Article 18.1.

Q.No 101	Country	Article Article 19.4	Ref. in National Report page 61

Question/ Comment

2.It is stated that "progressive improvement of units is under way at both NPPs in respect of severe accidents." Does it mean that the application of SAMG will be "de facto" after these improvements are completed?

Answer

Both plants (Dukovany in 2003 and Temelin in 2004) have already implemented SAMG. Plant specific SAMGs were developed based on WOG generic SAMGs and have been developed in cooperation with WEC engineers.

For the SAMG development purpose, all physical phenomena which might endanger containment integrity and corresponding risks have been assessed using PSA study level 1 and level 2. Consequently, many deterministic analyses of severe accident sequences (identified in PSA study) were performed. SAMG addresses all significant phenomena and risks that were identified and the strategies are supported by the results of performed analyses.

Strategies included in SAMG are supposed to be implemented with the existing equipment. None of the incorporated strategies require any design modification

prior to its usage. In some cases, the result of strategy implementation may be less effective as with design modification (e.g. after installation of passive hydrogen recombiners with the sufficient capability for severe accident), but all strategies can be implemented with positive effects to bring the plant to steady safe status even without any design improvements.

All design improvements will facilitate the implementation of SAMG strategies and will increase the expected positive effects, however the design improvements are not necessary conditions for SAMG implementation.

For additional information please look at the answer to question given by Finland under Article 18.1.

Q.No 102	Country	Article Article 19.5	Ref. in National Report Page 126
Question/ Comment	Do organisations or personnel outside the licensee’s direct employ provide any engineering and technical support? How does the licensee ensure that it does not delegate to support organisations responsibilities, which are properly those of the licensee?		
Answer	Because of legal regulations is not possible to transfer these responsibilities to any suppliers. CEZ, a. s., fulfills our legal responsibility through various tools. For example: Before a contract with suppliers is signed, they must prove their qualifications of licensee including their sub-suppliers’ qualifications. The grading principle must be used. The licensee performs an independent assessment of outputs and independent verification during the activities of their suppliers according to defined and documented process for project modifications.		
Q.No 103	Country	Article Article 19.6	Ref. in National Report page 61
Question/ Comment	3.Could Czech Republic present statistics on the development of events according to INES scale at both NPPs (during the presentation of its national report)?		
Answer	Yes, the Czech Republic can present statistics on the development of events according to INES scale at both NPPs (during the presentation of its national report).		
Q.No 104	Country	Article Article 19.7	Ref. in National Report
Question/ Comment	To what extent is the information on operational events distributed beyond the NPPs (additionally to those submitted to the IRS system)?		
Answer	The operating organization divides all events into events related to nuclear or radiation protections safety. The SUJB supervises this division. Then the operating organization investigates all events related to nuclear safety or radiation protections safety, including the root cause, and assigns corrective measure. SUJB supervision all this action. SUJBs refer only “interesting” events pertaining to operation to the IRS system.		
Q.No 105	Country	Article Article 19.7	Ref. in National Report

Question/ Comment	Please explain the principles or criteria applied by the regulator and operator for screening other experience than incidents (e.g., management issues, unexpected degradation, design weak-nesses, external hazards not considered earlier), for the purpose of ensuring adequate sharing of important experience with in-ternational interested parties (regulatory bodies, operators, de-signers, international bodies). Identify the relevant guide docu-ments, if any, used for the screening.
Answer	The Czech Republic (SUJB) does not have guide or other document used for screening foreign experience other than incidents. But the SUJB has bilateral agreements with regulators in surrounding countries, USA, Canada, France etc. under which such experience is obtained. SUJB also participates in the WWER Regulators Forum, NERS and OECD where such information of common interest is disseminated.

Q.No	Country	Article	Ref. in National Report
106		Article 19.7	

Question/ Comment	Please explain how the regulatory body ensures or verifies that the operators are informed and properly analyse the operating experiences reported through the well established international channels (e.g., WANO, IRS), and that they address the lessons learned by taking proper actions.
Answer	The Regulatory Body supervises Events Investigation Commission records from each NPPs received once a month. (the EIC meetings are held every month.) Selected events from WANO and IRS are included in these records. All new events of IRS and WANO systems are assessed and classified from the point of possibility to use them by a relevant NPP. For example 141 reports (WANO IRS) were processed in December 2007; 69 reports of them were selected for further information and 4 reports were assigned for additional analyses.

Q.No	Country	Article	Ref. in National Report
107		Article 19.7	

Question/ Comment	Please explain your national policy and practice of sending feedback reports to the international interested parties on actions that have been taken in your country as response to significant events reported through international channels (e.g., WANO, IRS).
Answer	Sending feedback reports is not a national policy. However, the feedback is usually delivered on international meetings. For example, lessons learned from the Forsmark 1 event were presented during last IRS meeting.

Q.No	Country	Article	Ref. in National Report
108		Article 19.7	P. 127,128

Question/ Comment	Could Czech Republic explain how lessons learnt from incidents occurred abroad were taken into account (sump strainers clogging, electrical system failures, conservatisms regarding the seismic behaviour…for example)?
Answer	Approximately five to ten remedial measures for events from WANO network or for the most severe reports of SOER, SER type with a certain output to modification of equipment, documentation or personnel training are taken annually at the Dukovany NPP in the process of feedback from external events. For example, measures based on experience gained from the event occurred at the Forsmark NPP in the area of electro were taken over the last three years. The

measures related to the improvement of emergency power of category 1. Based on the analysis of the SOER 2007-1 report “Reactivity Management”, measures aimed at completing the documentation, at emphasizing the Conservative Decision Making approach, at training the personnel of MCR on simulator and all personnel of the power plants in the area of “Reactivity Management” were taken.

One of the first safety-related improvements implemented in CEZ on the basis of experience from the Barseback NPP involved the improvement of strainers at the suction side of spray pumps of safety systems at the Dukovany NPP in 1999-2000.

Q.No	Country	Article	Ref. in National Report
109		Article 19.7	128 f.

Question/ Comment	Comprehensive information is given in article 19 on investigation of operational events. It is mentioned in § 14.1.6 “Operational Events Experience…” that both Czech NPP are actively involved in the worldwide event investigation process. Which screening criteria do exist for external experiences to be considered, and how operational experience, that is below the statutory reporting threshold, is being handled. It is mentioned further, that all obtained information is archived in a database, and used by NPP experts. How is the dissemination of operational experience ensured?
Answer	The external experiences are archived in an internal shared database. The major external sources for operational experiences are WANO and IAEA. For all external experiences, the following screening criteria to categorize the event are used: • Serious and unusual transients at the plants (unexpected reactor trip, damage of components, external events (floods, earthquake ...), human errors, multiple equipment failures, etc.) • Safety systems malfunctions or failures • Failures of main components with great economical impact • Excessive personal radiation doses or serious injuries • Excessive leakage of radiation or radioactive materials • Spent fuel damage or spent fuel cooling system failure during storage • Design weaknesses, inadequate analyses, management failures, MMI problems, procedures weaknesses, inadequate training • Other events (environmental aspects, fire protection, etc.) Based on these screening criteria the external experiences are categorized to any of the following event category: • Non-relevant events for CEZ plants (the database item is closed without further requirements) • Event for information (distributed for information only without requirements to response) • Significant event for CEZ plants (the event is analysed and corrective actions are specified) The internal database containing external experiences is shared by users from all plant departments and every user has access to all stored information. The designation of responsible department for certain event is part of an experiences screening process.

Q.No	Country	Article	Ref. in National Report

110		Article 19.7	

Question/ Comment

Reference to the Summary Report of the 3rd Review Meeting, item 36, 38, 42 and 43

The following set of questions is of special interest for Germany for the further development in this field. As some of these items may already be covered by your report or by other questions posted by Germany, we do not expect repetitions of information already delivered. Please just give additional information as appropriate. It was decided at the Third Review Meeting to discuss this topic at the Fourth Review Meeting.

1. Which are the screening criteria for the internal and external experiences to be considered? (Are audits and reviews performed by external experts for controlling the effectiveness of OEF? Which procedures, committees etc. are established for the review and exchange of operating experience at the plant operator level and the supervisory level?)
2. How is the implementation of lessons learned from operational experience monitored?
3. How are operating experiences handled that are below the statutory reporting threshold?

Answer

Ad 1) NPP uses different criteria for internal and external events. Correct selection of internal events for further analyses is verified and assessed by a regulatory body during regular inspection of experience feedback and during international WANO missions. Criteria for internal events are also assessed during regular meetings of experience feedback staff from Temelin, Dukovany, Mochovce and Bohunice NPPs. SUJB uses external staff to assess the correctness of event investigation. Based on a preliminary assessment of the external events, NPP divides events (reports) for information only and for further assessment by the departmental experts. An independent selection check of the reports presented isn’t provided; NPP works with all the reports posted up within the network of WANO and IRS.

Ad 2) The effectiveness of gained experiences is observed by the trend of the number of repetitive events. Selected events are trained on the simulator including the observation of operational staff responses. Selected events are introduced into the database of operational experience and maintenance and are used for the preparation of iterative actions. This was appreciated by WANO mission as a good practice.

Ad 3) All significant and less significant events are reported to the regulatory body. Less significant events are reported regularly as a list of events, significant events are reported together with the investigation analysis confirmed by the Failure Commission. Insignificant events and near miss are trended and recorded in the application programs of NPP, which are exploited by all staff of NPP. Trends of all these "substandard events" are regularly assessed at the operational meetings and are reported to the NPP’s management meetings. Information from the above-mentioned programs is available for the regulatory body as well as for any external missions.