Radiation and Nuclear
Safety Authority - STUK 11.4.2008

Answers to the written questions on the fourth Finnish National Report on Nuclear Safety Convention

The Finnish Report on nuclear safety - Finnish 4th national report as referred to in Article 5 of the Convention on Nuclear Safety

has been published as report STUK-B 80, September 2007. The report is available from STUK and also at the STUK's Internet site http://www.stuk.fi/ .

Questions Posted To Finland in 2008 and the answers to them

Q.No	Country	Article	Ref. in National Report
1	India	Planned Activities	Page-70, Section 3.1, Topic: Provision f

Question/ Comment: It is understood that the fabrication procedures have been modified to improve the resistance against stress corrosion cracking of safe end of the RPV nozzle in Olkiluoto 3. However, STUK has recommended a '10-year long aging surveillance programme' for dissimilar transition weld.
Please mention the salient requirements of the surveillance programme for dissimilar transition weld.

Answer: Actually the resistance against stress corrosion cracking (SCC) is not the main reason for the recommended surveillance programme. SCC resistance is expected to be reasonably high because of high Cr-content of the filler material Inconel 52. This filler material is, however, totally new solution in the safe end joints of question.

It is demonstrated that stress-relieving heat treatment (SRHT) of the RPV causes quite extensive carbide formation in the vicinity of the joint fusion line when applying the above mentioned consumable. It is not exactly known how strongly the metallurgical reactions could continue during long-term operation which might alter joint behaviour further. There is no operation-related know-how about these effects. In addition it is important to know what is the thermal ageing sensitivity of the HAZ of the LAS-steel in this case. For this reason a surveillance program has been seen important.

Q.No	Country	Article	Ref. in National Report
2	Russian Federation	Planned Activities	Section 3.1 (page 70)

Question/ Comment: To what extent do the procedures of using the living PSA in risk-informed regulation correspond to QA principles?

Answer: There are two viewpoints related to QA and risk information:

1. Regulatory Guide STUK-YVL 2.6 (in preparation) states that PRA shall be used in establishing the management system for a nuclear power plant. This means that risk information shall be used in planning of processes, tasks, actions, etc. (Risk Informed Graded Quality Assurance, RI-GQA). It follows from this statement that PRA itself is subject to QA principles.
2. Regulatory Guide STUK-YVL 2.6 sets also explicit QA demands for PRA and risk-informed applications.

Q.No	Country	Article	Ref. in National Report
3	Canada	General	Entire report

Question/ Comment: The report does not appear to discuss efforts to address specific concerns identified by Non-Governmental Organizations (NGOs) or the general public. Page 19 of the report discusses the willingness of STUK to listen to concerns; however, the successes/shortcomings of the communications program, in the eyes of the NGOs and public, are not discussed.

Answer: STUK itself has not defined how truthful is it's reputation among general public. Anyhow we can refer to surveys made by European Unions Eurobarometer (http://ec.europa.eu/public_opinion/archives/ebs/ebs_271_en.pdf) and Finnish energy industry (http://www.sci.fi/~yhdys/eas_06/english/eas-etied_06.htm). Results of those indicate that STUK is known and has a reputation of a trustworthy source of information.
Success or shortcomings in the eyes of NGOs has not been measured recently.

Q.No	Country	Article	Ref. in National Report
4	Hungary	General	Introduction p.7

Question/ Comment: „A Construction License of the new plant unit was granted by the Government in 2005 to Teollisuuden Voima Oy for constructing a Pressurized Water Reactor (EPR) unit of nominal reactor thermal power 4300 MW at the Olkiluoto site (Olkiluoto 3). „
Q: Considering the scientific forecasts the level of the sea may substantially increase in some decades as a consequence of global warming; have this problem been addressed during the design and construction of Olkilouto-3?

Answer: The question of climate change and forecast rise of seawater level has been addressed during the design and licensing process of Olkiluoto 3. The global climate change and its effects on ocean level have been estimated on the global level by the United Nations Intergovernmental Panel on Climate Change (IPCC) and on the national level by the Finnish Meteorological Institute and the Finnish Institute for Marine Research.

According to the scenarios of the IPCC assessment reports in 2001 and 2007, the expected average rise of the seawater level during the current century is about 4.3 mm per annum and, according to the worst IPCC scenario, the rise would be about 9 mm per annum.

In Finland the ground is rising due to the bedrock uplifting after the glacial period. In the Olkiluoto region the ground uplifting is about 7 mm per annum. In the Olkiluoto region, the maximum seawater level has been about +1.2 m above the long term average. The seawater level design basis of Olkiluoto 3 is +1.7 m for normal operation and +3.5 m for safe shutdown. Even in the worst case the rise of seawater level during the planned operating life of 60 years would be small in comparison with the safety margin.

Much higher estimates of the rise of seawater level, up to about six meters in a few decades, have also been presented in the media. These extreme estimates have not been considered realistic by the IPCC or by the Finnish national institutes. [In any case, the rise would be so slow that it would not be a nuclear safety issue, but rather an economic disaster for the whole coastal Finland.]

In addition to the global rise of seawater level, the climate change could result in more severe storms in the Baltic area and increase the height of storm surges. However, so far there is no indication that the effects would be significant compared to the present variability of storm intensity and seawater levels.

The forecast rise of seawater level is not considered a problem in the Olkiluoto 3 project. However, the effects of climate change on seawater level and other extreme phenomena relevant to nuclear safety is one topic in the Finnish national nuclear safety research program SAFIR2010.

Q.No	Country	Article	Ref. in National Report
5	India	General	Page 107, Annex 3

Question/ Comment: What is the postulated scenario which may lead to high-pressure core melt event and what is the criteria for manual depressurization.

Answer: The most important high pressure core melt scenarios in PWRs are those, in which the heat transfer to the secondary side is lost due to the initiating event, i.e. station blackout and total loss of feedwater combined with unavailability of safety injection.

The criteria for starting of manual depressurization are based on the temperature measurement of the core exit thermocouples. For the Loviisa VVERs the criterion is 450oC, for the Olkiluoto 3 EPR the tentative value is 650oC. The basis for the temperatures is the existence of superheated steam at the core exit, which indicates core heatup.

Q.No	Country	Article	Ref. in National Report
6	Japan	General	p.9, Sec.2.1

Question/ Comment: 2.1 Article 4. Implementing measures, 2nd Description, Last sentence says;
“This fourth report concentrates on the activities of licensees to fulfill the obligation of the convention.”
This report concentrates on the activities of licensees to fulfill the obligations of the Convention. Although the prime responsibility for safety rests with the operator, the regulatory side should also contribute to achieve safety. In this respect, the interaction between the regulatory body and the licensees should be discussed at the same time.
- When the regulatory body develops detail regulatory rules such as regulatory guides, the updated detail technical knowledge of the licensees, which is being improved constantly, becomes necessary. How is the interaction between the regulatory body and the licensees carried out for this purpose?
- Please tell us about the interaction activities between the regulatory side and the licensees. How is the communication done between the regulatory body and the operator, when the regulatory body makes some decision on various kinds of regulatory issues?

Answer: The interaction between the regulatory body and the licensees is very important, both concerning the development of regulations and the regulatory decision-making. In the Principles of Regulatory Activities (Guide STUK 3.1) it is stated that the regulatory control activities are arranged in such manner that along with verifying safety the regulatory control motivates the users of nuclear energy to a practice of as high quality as possible and emphasising safety viewpoints. For motivation it is essential that the objects of the regulatory control see the regulatory control as necessary, focused on right issues and conversant with the subject.

Especially concerning the development of regulations, the interaction between the regulator and the licensees takes place in many stages. To be able to follow the general development of the regulations, regular meetings are held with the licensees. For each STUK-YVL Guide, a contact person is nominated by the licensees

which makes it possible for the utilities to contribute to the development of each single guide already during the preparation of the document. Finally, before publishing the guides, they are sent for official comments to the licensees. If substantial comments are received in this phase, typically a meeting is arranged between the regulator and the licensees.

Concerning the decision-making it is stated in Guide STUK 3.1 that emphasising the responsibility of the licensees presupposes also preparedness for getting acquainted with their viewpoints and plans. If the viewpoints that have come up presuppose deviating from the licensee's presentation, the licensee will be given an opportunity to justify their presentation more accurately. If STUK's final resolution differs from the presentation of the licensee, clear justifications are given for the decision.

When setting a deadline to a licensee, its reality is considered in advance by taking into account the measures to be implemented in the required time schedule. Considerations can also be given on the possible impact that the deadline may have on the quality of the measures to be implemented. This does not concern exceptional situations where safety has been endangered and corrective measures or other actions to ensure safety must be required without delay.

Q.No	Country	Article	Ref. in National Report
7	Netherlands	General	Ch.3, pp 70, 71

Question/ Comment: Finland is embarking on an ambitious Risk Informed Regulation programme. This often means a decision-making where PSA input is weighed with cost-benefit considerations, effects on safety margins, defense-in-depth, test and maintenance strategies, earlier agreements between licensee and regulatory body, etc.
Are there any developments or plans to develop a more formal approach/ procedure how to weigh the different aspects in the decision-making?

Answer: Several risk-informed (RI) applications contain formal decision-making process in themselves. Some examples are RI-PSI (pre-service inspection), RI-ISI (in-service inspections), RI-IST (in-service testing), RI-TS (technical specifications).

For RI applications, STUK requires a methodology report from the licensee. Decision criteria are a part of a methodology report. Once the methodology is accepted, STUK makes independent review of the actual work.

While we have guidelines and limiting values, the regulatory decision-making is often done in a team of experts, where information is weighted according to its relevance, applicability and uncertainty. We do not consider fixed numeric limits very useful, since they may mask the actual decision-making. In case of fixed limits, we have to evaluate the credibility of presented values, and this goes back to expert work without fixed decision criteria.

Q.No	Country	Article	Ref. in National Report
8	Slovenia	General	

Question/ Comment: Does STUK allow dedication (qualification) of commercial grade equipment with intention to replace the equipment in plant safety systems.

Answer: STUK allows use of serial components (valves, pumps) in the safety systems provided that the component has been qualified by type tests or by operating experience under conditions the component is designed to work at the nuclear facility. Construction plans of such components shall include type test and operating records, which are used to evaluate the adequacy of the qualification for the components' acceptability for safety systems.

Construction plans are inspected and subjected to STUK's approval as normally used prior to manufacturing. If the component's qualification is found inadequate in this phase, type tests are required and the final evaluation of acceptability is based on the test results.

Q.No	Country	Article	Ref. in National Report
*	Argentina	Article 6	p.12

Question/ Comment: Please give details on the evaluations/tests made to estimate the Loviisa NPP lifetime at 50 years, taken into account that the original design age was defined in 30 years.

Answer: The prerequisites of the lifetime extension were formally demonstrated by updating the main components' fatigue usage factors to encompass the 20 more years of operation. This was done for the RPV, pressurizer, steam generator, main coolant pump, primary circuit piping and main isolation valve considering the true transient accumulation rates and measured severity which in many cases fell well below the overly conservative design specification. The thermal stratification and environmental effects of fatigue were added

to these analyses according to current requirements.

For the most lifetime limiting components, the current and foreseeable ageing mechanisms of their main parts were identified to conclude that the existing ageing management and maintenance procedures were adequate, also with regard to less predictable mechanisms like corrosion, thermal ageing and wear-out. These components were selected with a ranking system, based on the economical and operability impact of their unavailability. For instance, the lay-out hardly allows steam generator replacement; fortunately the tube plugging rates are as yet modest compared with other VVER's. Radiation embrittlement of the RPV was in turn found to be well managed with anneals. Its continued operation has been justified with a new surveillance programme and innovative fracture mechanics analyses based on the Master Curve concept.

The Finnish operating licences are generally granted for limited periods and will not be based on a pre-determined fixed lifetime. In Loviisa NPP, considerable upgrading of the plant concept and obviously unreliable components was already done during commissioning and early years of operation, and a systematic lifetime programme was launched ca. 15 years ago to identify further needs of replacement and introducing new technology. The true lifetime of the components neither depends solely on the design, but the operating organisation, which has the ultimate responsibility, can considerably affect it by minimizing thermomechanical loads and attacks by chemical impurities in transient situations. This has been incorporated into the training programmes and is demonstrated with the good operating experiences. History records and understanding the original design basis have been also well preserved, which enhanced the reliability of the evaluations and predictions done. These are imperative organizational prerequisites since reliable 20-year long physical predictions are feasible only for few ageing mechanisms.

Irrespective of the operating licences granted, maintaining adequate safety will be periodically evaluated in reviews done according to IAEA safety guide NS-G-2.10. The regulatory body STUK also continuously reviews the safety with several inspection procedures, largely on plant site. These served to substantiate some key arguments of Loviisa's lifetime extension application and would enable tackling any adverse trends during the licence period granted.

Q.No	Country	Article	Ref. in National Report
9	Canada	Article 6	Section 2.2.1, page 11, paragraph 1

Question/ Comment: The report indicates that "commercial operation" of Olkiluoto Unit 3 is expected to start in 2011. How advanced is the construction of this unit? What are the subsequent licensing stages that will be fulfilled until the unit is operational?

Answer: The remaining licensing step until commercial operation is the operating license. The unit must have the operating license before loading fuel into the reactor. The application for the operating license is expected to be submitted in May 2009 and the licensee expects to have the license in summer 2010.

The civil works are progressing at the Olkiluoto 3 in all buildings.

Nuclear Island: the outer wall of the reactor building has reached about +20 m level (final height about 60 m). Inner wall and inner structures are also progressing on lower levels. First pipes and tanks have been installed in the reactor building. Fuel and safeguard buildings are under construction. Fuel building outer wall has reached its final height and first two inner levels have been concreted. In safeguard buildings, outer walls are being concreted on different levels. Foundation works are ongoing for other nuclear island buildings (auxiliary, diesel and waste). Installation works are expected to be started in summer 2008.

Turbine Island: Civil works on turbine building will be finished within next months. Equipment installations have been started (condenser, piping systems, big heat exchangers, tanks etc.). Switch gear building is almost finished and ventilation ducts and cable trays are being installed. Sea water pumping station is under construction. Channels for sea water and cabling have been constructed earlier.

Q.No	Country	Article	Ref. in National Report
10	Canada	Article 6	Section 2.2.2, page12, Para. 1 and 4

Question/ Comment: The report indicates that the current "technical and economical" lifetime for Loviisa is estimated at 50 years, based on current knowledge of plant ageing. However, the original design age was 30 years. What "technical and economical" analyses were performed to reach this decision?

Answer: The prerequisites of the lifetime extension were formally demonstrated by updating the main components' fatigue usage factors to encompass the 20 more years of operation. This was done for the RPV, pressurizer, steam generator, main coolant pump, primary circuit piping and main isolation valve considering the true transient accumulation rates and measured severity which in many cases fell well below the overly

conservative design specification. The thermal stratification and environmental effects of fatigue were added to these analyses according to current requirements.

For the most lifetime limiting components, the current and foreseeable ageing mechanisms of their main parts were identified to conclude that the existing ageing management and maintenance procedures were adequate, also with regard to less predictable mechanisms like corrosion, thermal ageing and wear-out. These components were selected with a ranking system, based on the economical and operability impact of their unavailability. For instance, the lay-out hardly allows steam generator replacement; fortunately the tube plugging rates are as yet modest compared with other VVER's. Radiation embrittlement of the RPV was in turn found to be well managed with anneals. Its continued operation has been justified with a new surveillance programme and innovative fracture mechanics analyses based on the Master Curve concept.

The Finnish operating licences are generally granted for limited periods and will not be based on a pre-determined fixed lifetime. In Loviisa NPP, considerable upgrading of the plant concept and obviously unreliable components was already done during commissioning and early years of operation, and a systematic lifetime programme was launched ca. 15 years ago to identify further needs of replacement and introducing new technology. The true lifetime of the components neither depends solely on the design, but the operating organisation, which has the ultimate responsibility, can considerably affect it by minimizing thermomechanical loads and attacks by chemical impurities in transient situations. This has been incorporated into the training programmes and is demonstrated with the good operating experiences. History records and understanding the original design basis have been also well preserved, which enhanced the reliability of the evaluations and predictions done. These are imperative organizational prerequisites since reliable 20-year long physical predictions are feasible only for few ageing mechanisms.

Irrespective of the operating licences granted, maintaining adequate safety will be periodically evaluated in reviews done according to IAEA safety guide NS-G-2.10. The regulatory body STUK also continuously reviews the safety with several inspection procedures, largely on plant site. These served to substantiate some key arguments of Loviisa's lifetime extension application and would enable tackling any adverse trends during the licence period granted.

Q.No	Country	Article	Ref. in National Report
11	France	Article 6	P 12, § 2.2.3

Question/ Comment: Could Finland provide further details concerning the PSR ? Does it comply with the IAEA safety guide NSG 2-10?

Answer: The detailed requirements on PSR are provided in Guide YVL 1.1, chapter 5. This guide is available also in English language at STUK's website. Additionally to that, the licensees and STUK have discussed the requirements on PSR in order to clarify and complete as necessary the requirements for PSR reporting. Additional advice and orders can also be provided to the licensees in form of STUK's written decisions, as needed.

The IAEA safety guide NSG 2-10 on PSR was fully taken into account when revising the Guide YVL 1.1 last time (2006). It is our understanding that the requirements are in full compliance with the international good practices.

Q.No	Country	Article	Ref. in National Report
12	India	Article 6	Page 11, description in left Para 2 from

Question/ Comment: We understand that certain specifications were revised by TVO in view of the prevailing stringent Finnish requirements over the European Utility Requirements (EUR).
Please mention the Finnish requirements that were more stringent than EUR. Did these revisions in specifications result in any changes in the system design.

Answer: When preparing tendering dossier after Decision in Principle by the Finnish Government the utility TVO selected to use the European Utility Requirements Document as a basis document. Some of the safety requirements of the EUR Document were replaced with requirements of Finnish regulations and some operational requirements were replaced by TVO's own requirements. Any comparison study of the EUR requirements, and licensee's own requirements and requirements of Finnish regulations have not been made. The Finnish regulations are prepared, as a minimum, to comply with the IAEA Safety Requirements.

Q.No	Country	Article	Ref. in National Report
13	Slovenia	Article 6	P.11

Question/ Comment: TVO's specification complemented the EUR mainly in those points where Finish requirements are stringent. Can you briefly summarize the items, where Finnish requirements are more stringent than EUR or other

international standards for new builds.

Answer When preparing tendering dossier after Decision in Principle by the Finnish Government the utility TVO selected to use the European Utility Requirements Document as a basis document. Some of the safety requirements of the EUR Document were replaced with requirements of Finnish regulations and some operational requirements were replaced by TVO's own requirements. Any comparison study of the EUR requirements, and licensee's own requirements and requirements of Finnish regulations have not been made. The Finnish regulations are prepared, as a minimum, to comply with the IAEA Safety Requirements.

Q.No	Country	Article	Ref. in National Report
14	Ukraine	Article 6	Para 2.2.1, page 11

Question/ Comment Periodic Safety Review Report for Extension of Operating License of Loviisa NPP was developed separately for each unit Loviisa NPP or one PSRR for two units? How were taken into account differences in aging equipment unit 1 and 2 Loviisa NPP? Is scope of safety measures implemented on unit 1 and unit 2 Liviisa NPP the same?

Answer The Periodical Safety Analysis report addressed both Loviisa NPP units because it was submitted as part of a common lifetime extension application for both units. Generally speaking, the ageing management programmes are quite similar. The main difference from ageing point of view is the RPV, whose critical weld has less chemical impurities in Loviisa 2. Consequently, anneal was successfully carried out in Loviisa 1 in 1996 whereas for Loviisa 2 its need is uncertain even for the extended lifetime. Another distinguishing feature is the fatigue monitoring system which the utility has developed and implemented to identify stratification and mixing phenomena in the primary circuit. This system has been installed to Loviisa 1 only, assuming that this behaviour is similar in Loviisa 2.

All these differences were well known to the regulatory body STUK but were summarized in the reports submitted as part of the licence extension application.

Q.No	Country	Article	Ref. in National Report
15	Ukraine	Article 6	Para 2.2.3, page 12

Question/ Comment Has STUK established detail requirements on content of PSR report, because guide YVL 1.1 and Section 36 Nuclear Energy Degree give only general requirements? Does content of PSR report correspond to IAEA Safety Guide NS-G-2.10 "Periodic Safety Review of Nuclear Power Plants"?

Answer The general requirements of Guide YVL 1.1, chapter 5, are considered to be detailed enough to guide the licensees in preparing PSR reports. In practice, the licensees and STUK have discussed the requirements in order to clarify and complete as found necessary the requirements for reporting. Also additional advice and orders can be provided to the licensees in form of STUK's written decisions, as needed.

The IAEA safety guide on PSR was fully taken into account when revising the guide YVL 1.1 last time (2006). It is our understanding that the requirements are in full compliance with the international good practices.

Q.No	Country	Article	Ref. in National Report
*	Argentina	Article 7.1	p.13

Question/ Comment Regarding the NPPs licensing procedure, could Finland give details on the licensing process, particularly the concerning on the different types of licenses granted?.

Answer The licensing process for a new nuclear power plant includes the following phases:
- decision-in-principle
- construction license
- operating license.

The Decision-in-principle is done and licenses for the construction and operation are granted by the Finnish Government. The related administrative preparation work is carried out by the Ministry of Trade and Industry (since January 1, 2008 the Ministry of Employment and the Economy) but the Ministry is not a decision-making body. In addition to safety, many other essential issues are considered, and therefore the licensing decisions are made in Finland at the governmental level.

The Nuclear Energy Act includes conditions for Decision-in-principle and for granting licenses. These conditions relate also to safety. According to the Nuclear Energy Act, STUK's statement is needed for Decision-in-principle and for granting construction and operating licenses. In the statement is it considered whether safety related conditions are fulfilled. Any Decision-in-principle can not be made and any license can not be granted if the conditions are not fulfilled. So STUK has a clearly defined role in the licensing process based on the Nuclear Energy Act.

In addition to the nuclear power plant units, the similar licensing process is applied to nuclear waste disposal facilities and other significant nuclear facilities. Furthermore, e.g. the possession, fabrication, production, transfer, handling, use, storage, transport and import of nuclear materials and nuclear wastes as well as the export of nuclear wastes are subject to licenses.

The detailed requirements concerning licensing process are given in the Nuclear Energy Decree Chapter 5 and in STUK's Guide YVL 1.1. Both are available in English at STUK's website.

Q.No	Country	Article	Ref. in National Report
16	Australia	Article 7.1	

Question/ Comment: Australia is keen to learn of the indicators that the STUK 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: In STUK we have used balanced scorecard as a basis for our measuring system. We do have indicators for four areas: Human performance, processes, resources and effectiveness.

The effectiveness of outcomes is measured by a set of safety indicators. There are quite many indicators in this area: safety and quality culture, operational events and structural integrity. The annual report of safety indicators is available at STUK's website.

The efficiency of processes is measured by several indicators among them timeliness of decision making, implementation of inspection programmes and also findings in programmes.

STUK does not have a specific indicator for effectiveness of enforcement and compliance activities. However indicators such as exemptions and deviations of Technical Specifications are used as related.

Stakeholder satisfaction is measured on regular basis. In this connection for example licensees, universities, TSOs, funding organisations and ministries are considered as STUK's stakeholders.

Q.No	Country	Article	Ref. in National Report
17	Australia	Article 7.1	

Question/ Comment: With regard to the issue of transparency in nuclear safety regulatory decision making, Australia would be grateful for any information that Finland 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, particularly where there is no legislated process in place.

Answer: All decisions made by regulatory body as well as their justification memorandums are in principal public in Finland. So decisions are available by any citizen who will get this information. Exceptions to this are of cause are all the security issues as well as the trade secrets.

STUK also informs actively on decisions which might be interesting in common. This can be done by issuing press releases, by giving statements and or via website.

In addition to this STUK also participates meetings arranged by municipal organizations in municipalities where EIA process for new nuclear facilities have been initiated.

Q.No	Country	Article	Ref. in National Report
18	Canada	Article 7.1	Section 2.2.1, page 11, paragraph 1

Question/ Comment: Which elements of the EUR requirements have been adopted by STUK for new reactors and how are such elements integrated into STUK's regulatory framework?

Answer: When preparing tendering dossier after Decision in Principle by the Finnish Government the utility TVO selected to use the European Utility Requirements Document as a basis document. Some of the safety requirements of the EUR Document were replaced with requirements of Finnish regulations and some operational requirements were replaced by TVO's own requirements. Any comparison study of the EUR requirements, and licensee's own requirements and requirements of Finnish regulations have not been made. The Finnish regulations are prepared, as a minimum, to comply with the IAEA Safety Requirements.

Q.No	Country	Article	Ref. in National Report

19	Japan	Article 7.1	p.14, Sec.2.3.1

Question/ Comment: It is described in the report that the Nuclear Energy Act will be amended in 2008 for the purpose of presenting the principal safety regulations at the level of Act. Following this amendment, the Nuclear Energy Decree and all the General regulations will also revised. These amendments seem to be a big change. What are the principle safety regulations? In general, the law needs stability. What causes the amendment? What are the substantial points of amendments? Is it a modification of the legal framework?

Answer: Finnish legal institution composes of the Constitution, Acts, Decrees, Resolutions and Orders of the Authorities. Above all other legislation is the Constitution of Finland. Any lower legislation may not make except, even less conflict, with Constitution. The reformed Constitution of Finland came into force 1st of March 2000: main target of reform was to emphasise power of Finnish Parliament, for example by narrowing down prerogative powers of President of the Republic and restricting delegation of legislative powers to Council of State, ministries and other authorities - other governmental institution than parliament has not a general mandate to use legislative powers. A mandate for Council of State to give any Governmental Decrees concerning for example nuclear safety shall be set by a specific delegation provision in Nuclear Energy Act. Also STUK's mandate to give orders (aka YVL Guides) shall be given by specific provision in act. According to Constitution, these provisions of delegation should be clearly defined and concern very restricted issues. The Constitution especially sets out that the principles governing the rights and obligations of private individuals shall be governed by acts, not by decrees or in any other lower level of legislation. This principle applies also to other matters that under constitution are of a legislative nature.

Obeying the general system of law, nuclear legislation in Finland consists from Nuclear Energy Act (1987), Nuclear Energy Decree (1988) and five Government Resolutions: on Safety (1991), on Physical Protection (1991), on Emergency Preparedness (1991, on Disposal Facility (1991) and on Disposal of Nuclear Fuel (1997). It is clear that the law in force is not completely acceptable in constitutional mind because it is legislated before the new Constitution.

Development in nuclear technology is continuous and quite fast. Also meaning of organisational issues, for example safety culture, has grown significantly in nuclear safety field. During years it came inevitable to reform requirements on nuclear safety. According to Nuclear Energy Act the Radiation and Nuclear Safety Authority (STUK) shall put forward to the State Council the proposal for the general regulations (aka Governmental Decrees). Also, the content of decrees is more technical and detailed than act, so it was pragmatic to start the substantive reform paying attention first to the content of decrees, not the act.

The demand of examination of constitutionality is an obligation which can not be avoided in any legal reform progress. Otherwise it would be impossible to reform decrees, because Constitution expresses that if a decree contains any basic requirements that should be governed by act, requirement should not be applied. The main target of reform was to find out basic technical requirements having such a principal nature that they should be enacted by an act, not by decree or authority order. In practice this meant a thorough dissection of all prospective decrees in purpose to recognise basic requirements and to verify constitutionally appropriate level of legislation of requirements. Principal requirements that were transferred to level of act concern for example SAHARA principle, defence-in-depth, maximum values for radiation exposure, preparing for anticipated operational occurrences and postulated accidents, safety assessment, decommissioning, nuclear waste management, safety culture and quality assurance, nuclear security and emergency preparedness.

The constitution-based limited reform began in the end of year 2005 and has been followed through in co-operation between Radiation and Nuclear Safety Authority and Ministry of Trade and Industry (since January 1, 2008 the Ministry of Employment and the Economy). The project is yet unfinished but the purpose is to have reformed legislation in the first half of year 2008.

Q.No	Country	Article	Ref. in National Report
20	Latvia	Article 7.1	Part 2.3.4, P.18

Question/ Comment: Which conditions for power plant vendor about selection of the subcontractors were enforced initially? Why nobody from STUK and other institutions related to the decisions on construction permit did not impose requirements that subcontractors shall have prior experience in nuclear power plant construction? Will be such requirements incorporated in envisaged amendments related to similar processes for future activities in Finland to avoid delays and increase of price for the such projects?

Answer: Requirements that has to do with vendor and subcontractors performing nuclear power plant design, manufacturing and construction are presented in several regulatory guides (For example YVL 1.4 for management systems, YVL 2.0 for design organisations, YVL 3.4 for pressure equipment manufacturers,

YVL 1.3 for approval of inspection and testing organisations, YVL 4.1 and 4.2 for concrete and steel structures design, YVL 5.2 and 5.5 for electrical and I&C systems and equipment design and manufacturing etc.). Licensee has to be able to demonstrate that plant vendor has adequate experience to design the plant (requirement in YVL 2.0), this demonstration was given in the PSAR in construction license phase and extensive credit was given to previous plant projects. For the selection of subcontractors, there is no specific requirement that the subcontractor must have prior experience in nuclear power plant construction. YVL guides require that subcontractor is able to provide the quality required for nuclear applications and there are requirements for the quality to be reached. It is licensee's role to show that these requirements are met with the selected subcontractor.

It has not been decided yet if there needs to be additional requirements to require previous experience in nuclear construction. At the moment STUK's focus is on quality requirements. There are several ways for licensees to show that required quality can be reached (previous experience being one of those, but that alone is not adequate). It is in licensee's and vendor's interest to avoid additional delays and increases in price due to inexperienced subcontractors.

Q.No	Country	Article	Ref. in National Report
21	Sweden	Article 7.1	Section 2.3.1

Question/ Comment: It is mentioned that an amendment of the Nuclear Act is under preparation. The main purpose is to present the principal safety regulations at the level of Act. This is understood as giving these regulations a higher legal status. Please specify which regulations will be given this higher status and the reason for taking this step.

Answer: Nuclear legislation in Finland consists from Nuclear Energy Act (1987), Nuclear Energy Decree (1988) and five Government Resolutions: on Safety (1991), on Physical Protection (1991), on Emergency Preparedness (1991, on Disposal Facility (1991) and on Disposal of Nuclear Fuel (1997). Above all other legislation is the Constitution. Any lower legislation may not make except, even less conflict, with Constitution. It is clear that the nuclear law in force is not completely acceptable in constitutional mind because it is legislated before the new Constitution.

Development in nuclear technology is continuous and quite fast. Also meaning of organisational issues, for example safety culture, has grown significantly in nuclear safety field. During years it came inevitable to reform requirements on nuclear safety. According to Nuclear Energy Act the Radiation and Nuclear Safety Authority (STUK) shall put forward to the State Council the proposal for the general regulations (aka Governmental Decrees). Also, the content of decrees is more technical and detailed than act, so it was pragmatic to start the substantive reform paying attention first to the content of decrees, not the act.

The demand of examination of constitutionality is an obligation which can not be avoided in any legal reform progress. Otherwise it would have been impossible to reform decrees, because Constitution expresses that if a decree contains any basic requirements that should be governed by act, requirement should not be applied. The main target of reform was to find out basic technical requirements having such a principal nature that they should be enacted by an act, not by decree or authority order. In practice this meant a thorough dissection of all prospective decrees in purpose to recognise basic requirements and to verify constitutionally appropriate level of legislation of requirements. Principal requirements that were transferred to level of act concern for example SAHARA principle, defence-in-depth, maximum values for radiation exposure, preparing for anticipated operational occurrences and postulated accidents, safety assessment, decommissioning, nuclear waste management, safety culture and quality assurance, nuclear security and emergency preparedness.

Q.No	Country	Article	Ref. in National Report
22	Ukraine	Article 7.1	Para 2.3.1, page 13

Question/ Comment: Basic nuclear legislations were issued 20 years ago (Nuclear Energy Act in 1987 and Nuclear Energy Decree in 1988). Is STUK planning to update basic legislation for harmonization with WENRA reference levels?

Answer: Basic legislation has been regularly updated. For instance, the Nuclear Energy Act has been updated as follows: 1271/1988, 797/1989, 1420/1994, 593/1995, 1078/1996, 1077/1998, 635/1999, 870/1999, 396/2000, 738/2000, 880/2001, 415/2002, 742/2002, 1131/2003 and 769/2004.

A new change of Nuclear Energy Act is currently under the Parliament processing. Compliance with WENRA reference levels will be ensured by the end of 2010. Some of these reference levels are to be presented in legislation and the rest of them in the YVL Guides.

Q.No	Country	Article	Ref. in National Report
23	Ukraine	Article 7.1	Para. 2.3.2, page 14

Question/ Comment: Can you explain what was the reason for updating of the regulatory guides related to the design and construc¬tion of a new reactor after the Decision-in-principle for the new unit?

Answer: In STUK, we have a continuous process to develop/update new regulations. This process is not integrated to the licensing process.

In Finland, it is not enough just to maintain safety of nuclear facilities but the continual improvement of nuclear safety is required. Regulations are prepared always valid as such for new reactors. An effective enforcement process for operating plants and plants under construction does exist.

Q.No	Country	Article	Ref. in National Report
24	United States of America	Article 7.1	section 2.3.2

Question/ Comment: YVL Safety Guides are required to be followed unless alternatives acceptable to STUK are implemented. Describe the process for control of the plants= licensing and design basis.

Also, when new or revised YVL Safety Guides are issued STUK makes a separate decision for applicability to operating reactors. Describe the process for determining applicability.

Answer: When considering how new safety requirements presented in YVL Guides apply to operating NPPs, or to those under construction, STUK takes into consideration section 27 of the Government Decree (395/1991), which prescribes that “for further safety enhancement, actions shall be taken which can be regarded as justified considering operating experience and the results of safety research, as well as the advancement of science and technology”.

The process to enforce new and revised YVL Guides is following:
1. After publishing the new or revised YVL Guide a licensee is provided with a STUK letter, where STUK asks the licensee to justify in which extent a nuclear facility complies with the new or revised YVL Guide.
2. A duty of a licensee is to justify in which extent the facility and the licensee operations are in compliance with the new / revised regulations. If not in compliance with new or revised YVL Guide, the licensee shall present improvement programmes, compensatory measures, additional analyses or an application of exemption.
3. Based on licensee’s justification STUK makes the final decision how this new / revised YVL Guide shall be applied to operating NPPs or to those under construction.

Q.No	Country	Article	Ref. in National Report
25	Germany	Article 7.2.1	page 14, 2.3.2

Question/ Comment: In the report it is mentioned that new guides may not alter former decisions of STUK and that STUK made a separate decision how new guides are applied to operating facilities.
Under what circumstances are new guides valid for plants in operation?

Answer: When considering how new safety requirements presented in YVL guides apply to operating NPPs, or to those under construction, STUK takes into consideration section 27 of the Government Decree (395/1991), which prescribes that “for further safety enhancement, actions shall be taken which can be regarded as justified considering operating experience and the results of safety research, as well as the advancement of science and technology”.

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3. Based on licensee’s justification STUK makes the final decision how this new / revised YVL Guide shall be applied to operating NPPs or to those under construction.

Q.No	Country	Article	Ref. in National Report
26	Korea, Republic of	Article 7.2.1	Section 2.3.4

Question/ Comment: (Article 7-2-1, Section 2.3.4)
National report states that the oversight programme during operation has three levels: safety management,

main working processes and activities in different organizational and technical areas.
- Explain the inspection items contained three levels and their technical background
- Do you apply these inspection items to new NPP under construction?

Concerning the regulatory inspection planning using the RIR practices,
- How do you determine the risk significant area?
- What is the difference between inspection using risk information and existing inspection?
- Does the inspection using risk information replace the existing inspection?

Please explain the procedure to determine risk significance of operational events based on PSA and the cases to which this procedure applied.

Answer The C-level inspections are very detailed inspections focused on technical disciplines (I&C, mechanical components…) or organisational unit (radiation protection, physical protection emergency preparedness). The criteria level is regulations and licensees own instructions.

B-level inspections are targeted on main processes which we consider as operation, maintenance and safety upgrading. The main focus is on the processes and how well the licensees are able to run and develop them. The criteria level is regulations and licensee management system (QA-manual).

A-level inspection is targeted to management, organisational culture, continuous development and HR-development. In this inspection the main findings from the other inspections are also discussed. The criteria level is regulations, good practices from other industry and licensee management system and policies.

The new plant under construction has own inspection programme. The topics and inspection practices are the same but the programme is assessed and planned every six months.

Finnish regulation requires that the management of a nuclear plant shall be risk-informed. This means that the licensee himself identifies important systems and processes, and uses the information in training and development. In addition, STUK makes inspections and collects information about the quality of technical systems and organizational processes. Decisions about risk importance are made in teams consisting of experts of several disciplines.

Main use of risk information is in planning of inspection. Each specific inspection is planned by a team. The planning is based on specific and general plant experience and risk information (qualitative and quantitative). The nature of risk information used varies according to the inspection target.

Risk information is one additional piece of information that is used to guide existing inspections. There may be dedicated inspections created by a situation or need, but risk is again only one source of information.

Risk significance of operational events is computed for events that degrade components, systems or operator performance, or for occurred initiating events. This is done as risk follow-up at least once per year, which is also a part of our performance indicator system. The aim of the analysis is to estimate a generic importance, which means calculation of the risk as if the event could repeat itself at any random time. In this analysis, known failures or degradations are modelled in the PRA model, cutsets are recalculated, and the risk increase is divided into three categories.

Q.No	Country	Article	Ref. in National Report
27	Pakistan	Article 7.2.1	Article 7, Section 2.3.2,Page 14

Question/ Comment It is stated that “Detailed safety requirements are provided by STUK in the YVL Guides” It may please be explained that what procedure are applied if YVL guides do not provide required information on specific issues.

Answer When the YVL Guides do not provide required information on specific issues STUK makes “a case by case” decision (letter of STUK to a licensee) which is just valid for that specific issue.

Q.No	Country	Article	Ref. in National Report
28	Germany	Article 7.2.2	page 18, 2.3.4

Question/ Comment It is stated in the report, that there were also seven recommendations for the improvement in the practices of the regulatory body.
What are the topics of these recommendations and did STUK also react to these recommendations?

Answer Recommendations to STUK were on the following areas:

1. The findings of STUK inspectors should be systematically collected and analysed with the intent to identify recurring deficiencies. Particular attention should be paid to observations concerning weaknesses and problems in the management of organisations. STUK's management should regularly discuss the results of analysis with TVO's management to eliminate the identified problems and to improve the quality of operations.

As a result of the recommendation STUK has improved the collection of inspectors' findings by requiring more effective reporting and documentation from the inspectors. In addition, STUK has developed a method to collect and analyse these findings in a systematic way. This is done by organisational experts. One of the experts has also been nominated to the STUK's Olkiluoto 3 project group. Results of these analyses are periodically discussed with licensee's project management.

2. In case STUK's inspectors notice during audits that the quality systems and safety culture of the audited organisation are not on the level required by IAEA safety standards, they should ensure that TVO's representatives present the detected non conformancies and requirements on corrective actions in the most concrete and unambiguous manner. For this, STUK's management should clarify to their inspectors which requirements concerning quality systems and safety culture, provided by the IAEA safety standards, should be examined with particular care in evaluating the performance of organisations that participate in the construction of the power plant and manufacturing of equipment, and indicate STUK's expectations with regard to meeting the requirements.

As a result of the recommendation training on IAEA quality requirements was given to the inspectors. It was highlighted that recommendations must be very specific (more concrete than just making reference to the IAEA requirements and stating that they are not followed). Several meetings have been held internally and with licensee and Areva management to discuss what is the expectation for high safety culture form the subcontractors. Areva has published a brochure on the topic.

3. STUK's inspectors should actively demand TVOs representatives to take immediate corrective actions for elimination of any detected problems, where prompt actions are well founded to facilitate correction or to avoid new problems, and other parties have not taken the necessary action.

As a result of this recommendation issue has been discussed internally in the meetings and training sessions related to safety culture and quality requirements.

4. If quality deficiencies are detected in structures and equipment during STUK inspections, the performance of quality control organisations should also be assessed, in addition to production processes and products. STUK's management should ensure that it receives without delay a report and description of any occasions where the manufacturer or the builder is not producing sufficiently high quality and the quality control personnel of neither the consortium nor TVO has not demanded effective corrective action. Significant deficiencies detected in the performance of organisations should be discussed with TVO's project management.

As a result of the recommendation internal reporting system has been improved to be more systematic and distribution lists for inspection reports, minutes of the meetings etc. were reconsidered to ensure that flow of information is adequate and reaches right persons. Responsibilities for taking action in case of deficiencies were clarified. Management has also highlighted to the inspectors that they need to ensure that management understands correctly the significance of their findings (clear reporting, higlighting, discussions).

5. STUK should develop a practice that supplements the inspection records and other reports and allows direct communication of the most important quality problems and other deficiencies to the project managements of both STUK and TVO so that corrective actions can be initiated on an optimal schedule.

The actions related to this recommendation was combined with the previous one to quarantee effective reporting of significant deficiencies.

6. STUK should together with TVO find a way for improving the quality of all design and construction inspection documents submitted to STUK to a level that would eliminate the need of revisions, and repeated handling.

As a result of the recommendation master document model was initiated. It means that licensee and vendor together prepares a model document (design document for a component, structure or system, manufacturing document, etc.) which is then discussed with STUK. After agreement the “mass” production of similar kind of document starts.

7. In order to improve communication within STUK one should define the standard distribution of minutes of various meetings related to the OL3 project, as well as the obligation to get acquainted with these minutes. Also, a procedure should be defined for monitoring the implementation of the obligations recorded in the minutes.

As described in action to recommendation 4 distribution lists for various documents were reconsidered and enlarged. Follow up of open items was also enhanced in the status reports by indicating deadlines and responsibilities more clearly.

Q.No	Country	Article	Ref. in National Report
29	Japan	Article 7.2.2	p.16, left column

Question/ Comment: 2.3.3 System of licensing says;”--This period has been at the beginning 5 years and the about 10 years. ---- Olkiluoto units are valid for about 20 years”.
According to the description of Sec.2.3.3, the operating license is granted for 5 years at beginning and then about 10 years. We have thought that the period of the operating license is described strictly in the regulation in Finland. However, it seems to be flexible, as the current operating licenses are valid for about 20 years in Loviisa and TVO. Please tell us your concept on the period of the operating license. On what basis is the operating license determined?

Answer: The first operating licenses for the Loviisa and Olkiluoto plant units were issued based on the old nuclear energy legislation. That legislation did not include any specific regulations for the term of the operating licenses. The terms were from five to ten years. The main reason for limiting terms was the issue of waste management.

The current Nuclear Energy Act was established in 1987. Section 24 of the Act includes some specific requirements for the term of a license. According to that Section, an operating license shall be valid only for a specific time period. When considering the time period, particular attention shall be paid to ensuring safety and to the estimated duration of operations.
The current operating licenses of the Olkiluoto plant units were granted in 1998. They are valid to the end of 2018, as applied for by Teollisuuden Voima Oy. The new operating licenses for the Loviisa plant units were granted in 2007, and they are valid to the end of 2027 (unit 1) and 2030 (unit 2) as applied for by Fortum. However, the licenses include conditions for carrying out Periodic Safety Reviews.

Q.No	Country	Article	Ref. in National Report
30	Netherlands	Article 7.2.2	p.14

Question/ Comment: In the current licensing process for the siting aspects, a veto right is given to the municipality but not for the construction permit and the operation license. Do the local authorities have other rights than that of giving its opinion to the government? Are there ways to appeal for the public?

Answer: After decision-in-principle is made, the municipality does not have a veto right to prevent construction license or operation licence. But in addition to licenses under nuclear law, every construction must have a general building permit given by a municipality. So in theory there could be a possibility for the municipality to use conventional building legislation, or even other authorities to use environment legislation (water use permit), to block the project but this is an almost unthinkable possibility in practice and the result would be uncertain. The spirit of the integrated legislation is that political decision making is done before the major investments are started.

Public hearings (Nuclear Energy Act of Finland calls public hearing a "general hearing") are principally connected with environmental and municipal legislation. Concerning nuclear power plants, in connection with nuclear new build before the decision-in-principle is made the applicant shall compile according to instructions by the Ministry of Employment and the Economy (former Ministry of Trade and Industry) an overall description of the facility, the environmental effects it is expected to cause and its safety, and make it generally available to the public after a check by the Ministry. The Ministry of Employment and the Economy shall provide residents and municipalities in the immediate vicinity of the nuclear facility as well as local authorities an opportunity to present their opinions in writing before the decision-in-principle is made. Furthermore, in a way the Ministry may specify in more detail, the Ministry shall arrange a public gathering in the municipality where the planned site of the facility is located and during this gathering the public shall

have the opportunity to give their opinions either orally or in writing. Opinions that have been presented shall be made known to the Government. However, the basic principal in the Law on Publicity is that e.g. all documents submitted to the authorities (e.g. STUK) are public, unless there is a specific reason to declare them not public. The reasons are defined in the law and can be e.g. related to security or commercial business secrets. So in principal anyone can obtain documents from the authorities. This is in a way part of "public participation". As a party to Aarhus Convention, Finland (and the EU) is obliged to set criteria for public participation and citizen's access to justice in environmental matters.
What comes to right to appeal, decisions-in-principle made by the Government cannot be appealed. A registered association or a foundation whose purpose is to promote environmental protection, public health service or nature conservation or satisfaction concerning the residential environment, and in the scope of operations of which the environmental impacts concerned occur, has the right of appeal regarding the construction licence decision.

Q.No	Country	Article	Ref. in National Report
31	Netherlands	Article 7.2.2	p.14

Question/ Comment: Finland has decided to enact unlimited licensee liability by Law. Also in cases where nuclear damage has occurred in Finland and the third tier of the Brussels Supplementary Convention (covers up to 1500 million Euro) has been exhausted.
How realistic is the assumption, that the present Finnish operators could cover such an amount?

Answer: The first tier will go up to 700 M€ and shall be covered by the licensee with an insurance approved by the authorities. The second tier belonging to the state goes up to 1200 M€. The third tier goes then up to 1500 M€. If the consequences of the accident go beyond this limit, the licensees shall cover the damages with all their assets.

One basic requirement (Nuclear Energy Act, Section 19.9) is that the applicant has sufficient financial prerequisites to implement the NPP project and carry on operations. This means, that the financial circumstances of the applicants and licensees are being followed by the authorities. In practice, the Finnish license holder companies (Fortum, TVO) are in good financial situation.

Q.No	Country	Article	Ref. in National Report
32	Russian Federation	Article 7.2.2	Section 2.3

Question/ Comment: It is the Ministry of Trade and Industry within Finland's "legal and regulatory framework" that issues licenses for the construction and operation of nuclear installations, while the regulatory body is STUK (authorized nuclear and radiological safety body), which reports to another ministry – the Ministry of Social Issues and Health. However, the Ministry of Trade and Industry cannot issue a license without an appropriate application made by STUK. In this connection the following two comments could be made.
First, according to the definition made in Article 2 of the Convention "Regulatory Body" is a body which is authorized by law to issue licenses and which regulates such activities as siting, design, construction, commissioning, operation and decommissioning of nuclear installations. However, in Finland all regulatory provisions that are mandatory are set by governmental decrees, while the regulatory body - STUK - is authorized to supervise all above activities and publish respective "guidelines". Therefore, one has an impression that STUK's status as a regulatory body does not fully comply with the provisions made in Articles 2 and 7 of the Convention.
Second, since the Ministry of Trade and Industry is a body promoting nuclear energy, the fact that it performs functions of issuing licenses does not seem logical.
Could you please provide clarification regarding this?

Answer: The licensing process for a new nuclear power plant includes the following phases:
• decision-in-principle
• construction license
• operating license.

The Decision-in-principle is done and licenses for the construction and operation are granted by the Finnish Government. However, the Government is not considered as regulatory body. The related administrative preparation work is carried out by the Ministry of Trade and Industry (since January 1, 2008 the Ministry of Employment and the Economy) but the Ministry is not a decision-making body. In addition to safety, many other essential issues are considered, and therefore the licensing decisions are made in Finland at the governmental level.

The Nuclear Energy Act includes conditions for Decision-in-principle and for granting licenses. These conditions relate also to safety. According to the Nuclear Energy Act, STUK's statement is needed for Decision-in-principle and for granting construction and operating licenses. In the statement is it considered

whether safety related conditions are fulfilled. So STUK has a clearly defined role in the licensing process based on the Nuclear Energy Act. STUK also carries out regulatory control for ensuring that license conditions and safety regulations are fulfilled. Accordingly, STUK is considered the regulatory body.

In Finland, mandatory safety regulations are provided in the Nuclear Energy Act and decrees issued by the Government. Safety related Decrees are prepared by STUK based on the Nuclear Energy Act. This approach complies with the overall regulation system in Finland. In addition to safety decrees, STUK prepares and issues safety guides (YVL Guides). When a new safety guide is issued, STUK makes a separate decision on how this guide will be applied to operating nuclear power plants and plants under construction. These decisions are mandatory. For new nuclear power plants the guides are applied as such. As stated in our report, we consider that the Finnish regulations and practices are in compliance with Article 7.

Q.No	Country	Article	Ref. in National Report
33	Russian Federation	Article 7.2.2	Section 2.3

Question/ Comment: While describing a licensing procedure, you mentioned licenses for construction and operation. However, you use the term "construction permit" in the diagram in Figure 3.
Which one is correct?

Answer: In the Finnish legislation, at its original language in Finnish, only one term is used. It should systematically be translated into English with the word “license”. We are sorry for this confusion.

Q.No	Country	Article	Ref. in National Report
34	Canada	Article 7.2.3	Section 2.3.4, page 17

Question/ Comment: Concerning the subsection “Oversight during Construction” of Olkiluoto 3, what lessons were learned by STUK regarding the effectiveness of the inspection program, composition of the site inspection team, and communications between site and head-office?

Answer: In general, the Construction Inspection Programme as described in the report has been working effectively and supported STUK’s overall assessment on licensee’s performance and possibilities to control a turnkey project. Some specific points could be highlighted:
o Semi annual planning of inspection programme has enabled STUK to adapt and focus inspections with the project delays
o Frequency to inspect licensee’s QA activities twice per year has been adequate.
Inspections’ focus has been shifted to the processes and proactivity of licensee’s performance to guide contractors work in the forthcoming phases of the project (like installation, commissioning, operating license phase). This focus was decided to as result of the review and approval of detailed design documentation and concreting and welding performance at the site.

Q.No	Country	Article	Ref. in National Report
35	Canada	Article 7.2.3	Section 2.3.4, page 18

Question/ Comment: Under “Oversight during Construction” the report states that the STUK investigation team appointed to assess compliance with safety requirements in the construction of Olkiluoto 3 made recommendations for “improvement in the practices of the regulatory body”. What were the recommendations and what progress has been made in addressing them?

Answer: Recommendations to STUK were on the following areas:

1. The findings of STUK inspectors should be systematically collected and analysed with the intent to identify recurring deficiencies. Particular attention should be paid to observations concerning weaknesses and problems in the management of organisations. STUK's management should regularly discuss the results of analysis with TVO's management to eliminate the identified problems and to improve the quality of operations.

As a result of the recommendation STUK has improved the collection of inspectors’ findings by requiring more effective reporting and documentation from the inspectors. In addition, STUK has developed a method to collect and analyse these findings in a systematic way. This is done by organisational experts. One of the experts has also been nominated to the STUK’s Olkiluoto 3 project group. Results of these analyses are periodically discussed with licensee’s project management.

2. In case STUK’s inspectors notice during audits that the quality systems and safety culture of the audited organisation are not on the level required by IAEA safety standards, they should ensure that TVO’s representatives present the detected non conformancies and requirements on corrective actions in the most concrete and unambiguous manner. For this, STUK’s management should clarify to their inspectors which requirements concerning quality systems and safety culture, provided by the IAEA safety standards, should

be examined with particular care in evaluating the performance of organisations that participate in the construction of the power plant and manufacturing of equipment, and indicate STUK's expectations with regard to meeting the requirements.

As a result of the recommendation training on IAEA quality requirements was given to the inspectors. It was highlighted that recommendations must be very specific (more concrete than just making reference to the IAEA requirements and stating that they are not followed). Several meetings have been held internally and with licensee and Areva management to discuss what is the expectation for high safety culture form the subcontractors. Areva has published a brochure on the topic.

3. STUK's inspectors should actively demand TVOs representatives to take immediate corrective actions for elimination of any detected problems, where prompt actions are well founded to facilitate correction or to avoid new problems, and other parties have not taken the necessary action.

As a result of this recommendation issue has been discussed internally in the meetings and training sessions related to safety culture and quality requirements.

4. If quality deficiencies are detected in structures and equipment during STUK inspections, the performance of quality control organisations should also be assessed, in addition to production processes and products. STUK's management should ensure that it receives without delay a report and description of any occasions where the manufacturer or the builder is not producing sufficiently high quality and the quality control personnel of neither the consortium nor TVO has not demanded effective corrective action. Significant deficiencies detected in the performance of organisations should be discussed with TVO's project management.

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5. STUK should develop a practice that supplements the inspection records and other reports and allows direct communication of the most important quality problems and other deficiencies to the project managements of both STUK and TVO so that corrective actions can be initiated on an optimal schedule.

The actions related to this recommendation was combined with the previous one to quarantee effective reporting of significant deficiencies.

6. STUK should together with TVO find a way for improving the quality of all design and construction inspection documents submitted to STUK to a level that would eliminate the need of revisions, and repeated handling.

As a result of the recommendation master document model was initiated. It means that licensee and vendor together prepares a model document (design document for a component, structure or system, manufacturing document, etc.) which is then discussed with STUK. After agreement the "mass" production of similar kind of document starts.

7. In order to improve communication within STUK one should define the standard distribution of minutes of various meetings related to the OL3 project, as well as the obligation to get acquainted with these minutes. Also, a procedure should be defined for monitoring the implementation of the obligations recorded in the minutes.

As described in action to recommendation 4 distribution lists for various documents were reconsidered and enlarged. Follow up of open items was also enhanced in the status reports by indicating deadlines and responsibilities more clearly.

Q.No	Country	Article	Ref. in National Report
36	Russian Federation	Article 7.2.3	Section 2.3

Question/ Comment: The Section dealing with legislature and mandatory governmental regulatory provisions provides the description of STUK's activities, which are necessary in order to comply with this legislature, rather than the description of this legislation.

What do you mean by Inspection Programs? Are they individual documents or general guides? How is all this reflected in terms of licenses' validity? Nothing is said in the report about license terms, though this issue was mentioned in Parts iii and iv of Article 7 of the Convention. What is the existing process of inspecting contractor activities?

Answer The main contents of Finnish Inspection Programmes (one for operating units, the other for units being constructed) are described in Guide YVL 1.1, chapters 7 and 8. This guide is available in English language at STUK's website. The phrase "Inspection Programme" is a title for a set of several inspections focused at safety relevant issues.

The inspection programmes are one means to STUK to regulatory control of the use of nuclear energy. That is, one means to verify the compliance of the licensee actions with the legal requirements as well as licensing terms.

The fundamental safety requirements are given in the Finnish nuclear legislation and detailed requirements in lower level regulations and guides. Important plant related (license) terms are incorporated into a separate document and must be approved by STUK before issuing Operating License. Such document is called in some countries "Operating Limits and Conditions" and in some others "Technical Specifications". In Finnish legal system it is not necessary to repeat these as license conditions. Therefore, the Finnish licenses (operation, construction) do not include a large number of terms as may be the case in some other countries. Typically, the license terms include only e.g. the maximum power level, the duration of the license, time limits for PSR, maximum amount of nuclear waste etc.

For the issue of contractor control, please see answers No 20, 38 and 39.

Q.No	Country	Article	Ref. in National Report
37	Sweden	Article 7.2.3	Section 2.3.4

Question/ Comment It is mentioned that an investigation team was appointed 2006 to assess compliance with safety requirements in the construction of Olkiluoto 3. This investigation team also examined why the regulatory oversight of STUK had not prevented the observed problems. What were the conclusions with regard to STUK´s oversight? The investigation team stated that major problems in the construction of the new plant involved project management, in particular with regard to construction work, but not nuclear safety. How was it possible to separate these two dimensions considering the nature of the detected deficiencies.

Answer STUK's oversight of construction and manufacturing in OL3 project at that time was primarily focused on ensuring the quality and safety of the end products. Enough attention was not paid to the common organisational factors underlying technical problems and their connection to the recurring problems was neither analysed. STUK had no systematic procedure for recording, collecting and analysing signals received from different sources about the performance of organisations. Scattered signals had not always reached the management of the FIN5 project or STUK's management for enabling effective reactions to them.

When participating in audits conducted by TVO STUK's inspectors had often recorded in their inspection reports that the development of the safety culture had not received enough attention in the audited organisations and that TVO had given notice of it. However, STUK's inspectors had not usually identified the individual deficiencies observed in the safety culture, and STUK had not required TVO specify them in the notices given as part of the audits to provide the audited organisation a clearer idea of what is expected from the safety culture.

In some cases STUK's representatives failed to require correction of problems detected by them when problems should have been corrected without delay to make for easy correction and to avoid new problems. As the problems observed by STUK's inspector were recorded in documents presented to TVO or sometimes only communicated orally and without stressing the urgency of the measures to be taken, the information was slow to reach the parties who should have taken the corrective action. For example problems which had arisen during minor concreting (fuel building, amount of concrete ca. 1500 m3 and safeguard buildings, ca. 2000 m3) performed in the mid of August and in the beginning of September 2005, had been known by STUK's experts but not communicated widely enough at STUK and thus did not result in measures for ensuring the smooth implementation of the main concreting (reactor building and safeguard buildings, amount of concrete ca. 12 000m3) in the beginning of October 2005.

The FIN5/OL3 project includes a lot of meetings between STUK's own personnel, with representatives of TVO, and often also with representatives of the plant supplier. The status of different meetings and possible decisions taken in them seemed to be unclear to some parties outside STUK. The investigation team

demanded a systematic method for distribution of the minutes of the meetings to ensure smooth flow of information, and to specify responsibilities for monitoring the fulfilment of the recorded obligations.

Problems in manufacturing of the equipment and in construction were found to be related to the management of the project. Communication of requirements on quality and quality control, from FANP to subcontractors, had occasionally been deficient. Essential quality requirements had not been clearly specified at the stage of the invitation to tender. Subcontractors refused to comply afterwards with additional demands that exceed the scope of the agreement. The investigation found, however, that these problems would have compromised the quality of the final products in which serious breach of quality were not detected. The required standards have been maintained and, on the basis of tests and inspections conducted, they have been met, although in some cases only after corrective measures. The concrete base slab meets with large margin all specifications that are relevant for long term durability and strength. Steel liner has also been corrected to meet all of its safety targets. The observed difficulties at the construction stage have therefore not influenced the safety of the power plant when it will be ready to operate.

Q.No	Country	Article	Ref. in National Report
38	United Kingdom	Article 7.2.3	Page 17

Question/ Comment: Oversight activities of Olkiluoto 3 construction are reported and this oversight resulted in concerns being voiced about safety culture and safety management at the subcontractor level. Improvements were identified for the Licensee TVO, the main contractor and STUK. What improvements were made to the practices of STUK to ensure that licensees' supervision of contractors and sub-contractors are effective in maintaining safety? How does STUK determine that a licensee is sufficiently in control of a turn-key contractor?

Answer: The main tools for STUK to determine that licensee is sufficiently in control of a turn-key contractor are
ƒ{ Review and approval of the detailed design documentation prior commencement of manufacturing and construction. Detailed design documentation has to be approved by the licensee prior submittal to STUK. Shortcomings in the documentation reveals deficiencies in licensee¡¦s performance to understand the safety significance of the design and to guide and control contractors.
ƒ{ STUK¡¦s construction inspections on manufacturing and at the construction site. The goal of the construction inspections is to verify that products conform to the requirements and that the licensee, contractor and the subcontractor have fulfilled their obligations during manufacturing and construction. Deficiencies detected in the inspections reveal shortcomings in licensee¡¦s performance to control contractor and its subcontractors.
ƒ{ Inspections on licensee¡¦s performance within the Construction Inspection Programme (including inspections on Project management, organisation, resources, handling of safety issues, QA, and QC in construction, manufacturing, installation, commissioning, review and approval of the design etc.).
ƒ{ Oversight by resident inspectors at the construction site.

To ensure that licensees¡¦ supervision of contractors and sub-contractors are effective in maintaining safety, several measures were taken. For example:
o STUK re-focused its Construction Inspection Programme¡¦s inspections on licensee¡¦s activities to proactively control and oversee contractor¡¦s performance
ƒ{ licensee¡¦s activities to participate in the meetings between contractor and its subcontractors
ƒ{ licensee¡¦s knowledge on the manuals (Project, Design, Site, Installation, Commissioning etc.) that guide the work of contractor and its subcontractors
ƒ{ licensee¡¦s audit planning and performance in the forthcoming contractor and site activities like installation and commissioning
ƒ{ licensee¡¦s QA and QC activities.
o STUK increased its oversight resources at the site by recruiting two new resident inspectors to oversee construction at the site
o New meeting forums were established between STUK, licensee and contractor Project Management to discuss upcoming safety issues.

Q.No	Country	Article	Ref. in National Report
39	United Kingdom	Article 7.2.4	Page 18

Question/ Comment: Did STUK use any of its enforcement powers in the oversight activities at Olkiluoto 3 referred to above? What powers are available to STUK to regulate the way in which its licensee controls contractors and sub-contractors and to ensure its licensee maintains its responsibility for safety when it is using a turn-key contractor?

Answer: The most effective means is to stop the construction totally as long as the prerequisites for constructing the unit safely do not exist. In this case the deficiencies of the supplier and contractors were so obvious and also came to publicity, that no formal decisions were needed by STUK. The power company and plant supplier

decided by their own to start several actions to recover the necessary conditions for continuing the construction.

STUK supervision and enforcement powers are described in chapter 10 of the Nuclear Energy Act (11.12.1997/990), for more details see http://www.edilex.fi/stuklex/en/lainsaadanto/

How STUK oversees licensee's performance to maintain its responsibility for safety was described in the previous answer No 38.

Q.No	Country	Article	Ref. in National Report
40	Canada	Article 8.1	Page 19

Question/ Comment: It is stated that members of the Advisory Committee on Nuclear Safety and the Advisory Committee on Radiation Safety are nominated by the Government. Describe the composition of these committees and their reporting relationships within STUK. What competencies are assumed or required of the members for these committees?

Answer: The establishment of ACNS is based on Nuclear Energy Act (Section 56) and its duties and composition are provided by a specific Decree on ACNS. In ACNS there are seven regular members, the Director General of STUK is so called permanent expert, and additionally the committee can invite to its work external experts. For preparatory work, the committee has also established three working sections (reactor safety, waste safety, emergency preparedness and safeguards). According to the Nuclear Energy Act, the Committee shall work to prepare matters concerning the safe use of nuclear energy in conjunction with the STUK. Those called as members of the Advisory Committee shall represent high-quality expertise in the field of nuclear safety. In practise, they are Senior Experts, Managers and Professors in national research institutes, governmental organizations and universities. Also retired persons having wide experience in nuclear field have been nominated to the committee.

The establishment of ACRS is based on Radiation Act (Section 7) and its duties and composition are described in the Radiation Decree (Section 30). In ACRS there are nine regular members and it is permitted to call additional permanent experts. This committee works in conjunction with the Ministry of Social Affairs and Health. The competence requirements to this committee are equal to those of the ACNS given above.

Q.No	Country	Article	Ref. in National Report
41	France	Article 8.1	p. 19, § 2.4

Question/ Comment: The reports mentions the establishment of an “Advisory Committee on Nuclear Safety” to advise STUK on safety issues and regulations. Is this Committee a permanent entity or is it activated when a specific decision is to be made by STUK? Could Finland also provide information on the profile of members of the Committee?An “Advisory Committee on Radiation Safety” advising the Ministry of Health and Social Affairs is also mentioned. What are the exact role and position of this committee given that STUK is also in charge of advising the Government on radiation safety?

Answer: The ACNS and the ACRS are permanent entities and nominated by the Government for a three years period at a time. The ACNS duties are given by a Decree (164/1988) and the ACRS duties by the Radiation Decree.

The ACNS committee shall
• follow developments pertaining to the safe use of nuclear energy and to research in the field and make suggestions for the necessary measures,
• give statements about licence applications pertaining to the construction and operation of nuclear facilities as well as about other significant applications regarding the use of nuclear energy
• give statements about questions that are significant from the viewpoint of the control of the safe use of nuclear energy
• give statements and make suggestions pertaining to the development of legislation concerning safety control pertaining to the use of nuclear energy
• review and assess rules, regulations and guides about the safety of the use of nuclear energy prepared by the Radiation and Nuclear Safety Authority (STUK) and other authorities; as well as
• for its part, help maintain and promote co-operation between authorities and associations dealing with questions relating to the safety of the use of nuclear energy.

The ACRS committee shall
• address issues of principle concerning radiation safety
• monitor general developments in radiation safety
• make proposals and suggestions in matters concerning radiation safety
• issue opinions concerning radiation safety, and

• perform other tasks assigned thereto by the Ministry of Social Affairs and Health.

Concerning the role of these two committees, they both are expert organs to advise STUK and Ministry of Social Affairs and Health. However, there are several occasions given by law where the authorities are requested to ask for the committees' formal statements.

Please, see also the answer to question 40 above.

Q.No	Country	Article	Ref. in National Report
42	Latvia	Article 8.1	Part 2.3.5, P.19

Question/ Comment: There is the statement: "STUK does not grant any construction or operating licences for nuclear facilities. However, in practice no such licence would be issued without STUK's statement where the fulfilment of the safety regulations is confirmed." Is it any intention to increase legal power of STUK (to replace wording from would to shall)?

Answer: The licensing process for a new nuclear power plant includes the following phases:
• decision-in-principle
• construction license
• operating license.

The Decision-in-principle is done and licenses for the construction and operation are granted by the Finnish Government. The related administrative preparation work is carried out by the Ministry of Trade and Industry (since January 1, 2008 the Ministry of Employment and the Economy) but the Ministry is not a decision-making body. In addition to safety, many other essential issues are considered, and therefore the licensing decisions are made in Finland at the governmental level.

The Nuclear Energy Act includes conditions for Decision-in-principle and for granting licenses. These conditions relate also to safety. According to the Nuclear Energy Act, STUK's statement is needed for Decision-in-principle and for granting construction and operating licenses. In the statement is it considered whether safety related conditions are fulfilled. Any Decision-in-principle can not be made and any license can not be granted if the conditions are not fulfilled. So STUK has a clearly defined role in the licensing process based on the Nuclear Energy Act, and no modifications are now being planned as regards this issue.

Q.No	Country	Article	Ref. in National Report
43	Netherlands	Article 8.1	p.20

Question/ Comment: All cost for the regulatory control activities of STUK are paid by the licensee. Does this include the costs of the associated regulatory review and assessment activities conducted by the TSOs? Or do the licensees pay the TSOs directly?

Answer: STUK orders TSO support as needed. STUK uses these TSO review and assessment reports in its decision making process. All the decisions are made by STUK. The costs of the TSO organizations are charged from the licensee by STUK. More data of the content of TSO support and the cost can be found in the Annual report on the "Regulatory Control of Nuclear Safety in Finland". The report for the year 2006 (STUK-B 79) is available at STUK www site.

Q.No	Country	Article	Ref. in National Report
44	Netherlands	Article 8.1	p.21

Question/ Comment: It is stated that about 35 man-years was needed for the review and assessment activities associated with the construction permit of Olkiluoto 3, and since the beginning of 2005 the annual volume for the oversight of the construction of Olkiluoto 3 is 25 man-years. Does that include the review and assessment activities for all the detailed design and design changes taken place?

Answer: This figure includes all the review and assessment made by STUK experts. In addition to this independent analysis and review work has been ordered from TSO organizations and consulting companies. The volume of that ordered work has been about 5 man years in 2006 and 6,5 man years in 2007. In more detailed data of the TSO support ordered by STUK can be found in the report "Regulatory Control of Nuclear Safety in Finland, Annual report". The report for the year 2006 is available in English at STUK web site (STUK-B 79).

Q.No	Country	Article	Ref. in National Report
45	Russian Federation	Article 8.1	Section 2.4

Question/ Comment: In Finland licensees are fully responsible for reimbursing the costs of STUK's regulatory inspections. At the same time, since 2000 the licensees have been paying directly to STUK.
How is the financial independence of the Regulatory Body from the Operator and from other organizations assured?

Answer STUK is working under the Ministry of Social Affairs and Health. The safety goals and the goals for the annual oversight work are agreed with the ministry. STUK prepares an action plan and the related budget which is signed. STUK reports of its work and the status of the utilities to the Ministry of Social Affairs and Health and to the Ministry of Employment and Economy which is the licensing authority in the field of nuclear energy in Finland. The relation of STUK to governmental organizations is shown in Figure 4 of the Finnish 4th report on the CNS.

Since the beginning of the operation of nuclear power plants in Finland the costs of the regulatory control have been charged to the licensees. Until the end of 1999, the licensees paid STUK's invoices to the Government (State Treasury), and STUK received the needed financial resources through the state budget. The strategy of reimbursing regulatory control costs was changed in 2000 to so called net budgeting model. This means that the licensees pay the regulatory control fees directly to STUK. This approach is a common practice in Finland, and the change concerning reimbursing of STUK's regulatory control costs was carefully analysed and discussed.

The reimbursement principles are provided in the Finnish legislation, and the licensees have to pay STUK's invoices based on the law. This practice has not endangered the independence of STUK as a regulatory body.

Q.No	Country	Article	Ref. in National Report
46	Canada	Article 8.2	Page 21

Question/ Comment Under "Finance and Resources of STUK", it is reported that the independence from utility driven research projects of STUK's two main technical support organizations (VTT and GTK) was assessed in 2000 and 2001 through quality audits. How often are quality audits of technical support organizations conducted? Are there any plans for follow-up audits within the next few years?

Answer Until now STUK has not conducted quality audits of TSOs on regular basis. In the end of year 2007 it was decided that TSOs used by STUK shall be audited in every three to five years and internal guidance on conducting audits will be published this year. Audits of main TSOs will be conducted within next two years.

No follow up audit of VTT has been conducted due many organisational changes at VTT. In 2005 one STUK representative participated VTT audit which was conducted by SAFIR (Finnish research programme on nuclear power plant safety).

Q.No	Country	Article	Ref. in National Report
47	Germany	Article 8.2	

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 between the functions of the regulatory body and those of any other body or organisation concerned with the promotion or utilization of nuclear energy is not explicitly provided in the Nuclear Energy Act. However, this principle has been taken into account at the legislation level e.g. when the functions of STUK and other governmental organisations are defined. In the field of nuclear energy, the functions of STUK are provided in Section 55 of the Nuclear Energy Act. More broadly the functions are given in the Decree on STUK.

Q.No	Country	Article	Ref. in National Report
48	Germany	Article 8.2	

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 In the Finnish report the word independent has been used for describing the status of STUK as a regulatory body. Independence means that the functions of STUK have been separated from the functions of other organizations, which may have also nuclear energy promoting aspects. STUK is under administrative control of the Ministry of Social Affairs and Heath and is thus clearly separated from bodies and organizations concerned with the promotion or utilization of nuclear energy.

Q.No	Country	Article	Ref. in National Report
49	Russian Federation	Article 8.2	Section 2.4

Question/ Comment: Though STUK does not issue licenses, it has sufficient rights to regulate safety by means of guidelines and direct decisions. Judging by the description of STUK's activities, it seems that an operating organization cannot make any safety-related decisions on its own without STUK's approval. It is not quite clear from the descriptions provided in the report, in what form (way) are these approvals issued, most likely not through the terms of license, since licensing is not the function of STUK. STUK's approvals are needed for the appointment of individuals from an operating organization who are involved in safety-related activities. They are chief executives of an operating organization, personnel responsible for non-destructive testing of pressurized components, etc. STUK also needs to approve organizations carrying out such activities. STUK has a legal right to demand that a plant be upgraded. One may suppose that despite the provision regarding an operating organization's responsibility stipulated in Finland's legislature this will invariably lead to shifting this safety responsibility form the operating organization to STUK.
Is that so?

Answer: In the Nuclear Energy Act it is stipulated in the Section 9 Licensee obligations that "It shall be the licensee's obligation to assure safe use of nuclear energy".

In Guide YVL 1.1. it is stated that the licensee bears primary responsibility for the safety of a nuclear facility. It is essential that the measures of the licensees shall be sufficient to ensure safety and that STUK independently verifies the achieving of the required safety level by regulatory control.

In the regulatory control activities the undivided safety responsibility of the licensees is taken into account. The regulatory body shall retain its objectivity when evaluating safety provisions. This presupposes that the representatives of STUK do not provide ready made models concerning operations or technical solutions to the licensees.

The licensees always have to make their own decisions first. STUK follows very carefully that the licensees bear their responsibilities in all safety related activities and that this responsibility is not shifted to STUK.

Q.No	Country	Article	Ref. in National Report
50	United Kingdom	Article 8.2	Page 19

Question/ Comment: The report states that STUK is known amongst the general public and that information from STUK is regarded as truthful. To what extent is this statement based on surveys of public opinion? How often are surveys made and with what size of sample? Are they carried out by an independent organisation? Are other stakeholder groups, other than the general public, also surveyed for their opinion on STUK and, if so, what are the questions asked of them?

Answer: STUK itself has not defined how well known it is or how truthful is it's reputation among general public. Anyhow we can refer to surveys made by European Unions Eurobarometer (http://ec.europa.eu/public_opinion/archives/ebs/ebs_271_en.pdf) and Finnish energy industry (http://www.sci.fi/~yhdys/eas_06/english/eas-etied_06.htm) Results of those indicate that STUK is known and has a reputation of a trustworthy source of information.

Opinions of journalists and different stakeholder groups are studied regularly in surveys ordered by STUK. These studies are made by independent research organisations and normal intervals between surveys are 2–4 years.

Q.No	Country	Article	Ref. in National Report
51	Germany	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: The principle, that prime responsibility for the safety of nuclear installations rests with the holder of the relevant license, is laid down explicitly in national regulations.

Please, see also the answer to question 49.

Q.No	Country	Article	Ref. in National Report
52	Slovenia	Article 9	Art.9,Ch.2.5,p.23, Art.11,Ch.2.7.1,p.27

Question/ Comment: You reported that the nuclear power companies are obliged to set aside to the Nuclear Waste Management Fund the required amount of money in order to ensure their financial liabilities for the future management and disposal of nuclear waste and for the decommissioning of nuclear facilities. For the case of insolvency they must provide securities for that part of liabilities which is not covered by the Fund.
We would appreciate if you could provide us with an explanation on what kind of securities are presented to the Ministry of Trade and Industry for ensuring financial liabilities, not cover by the Fund (ref. to the text under Chapter 2.5)
Furthermore we would appreciate if you could explain whether the licensee has to provide also some kind of securities for taking care of the safety of the Plant (ref. to the text under Chapter 2.7.1)

Answer: Acceptable securities are stated in the Section 45 of the Nuclear Energy Act (990/1987):
1. credit insurance provided by an insurance company;
2. direct liability guarantee provided by a Finnish savings bank; or
3. such real estate mortgage or direct liability guarantee by a Finnish corporation as has been accepted by the Government as corresponding in reliability to the security referred to in paragraph 1 or 2 (e.g. a nuclear facility is not a valid security).
A security with a validity period of less than five years cannot be accepted.

More detailed requirements for securities are stated in the Nuclear Energy Decree (161/1988), Sections 92-97.

There is no exact legal requirement for financial securities to take care of safety. However, one basic requirement (Nuclear Energy Act, Section 19.9) is that the applicant has sufficient financial prerequisites to implement the NPP project and carry on operations. This means, that the financial circumstances of the applicants and licensees are being followed by the authorities. In practice, the Finnish license holder companies (Fortum, TVO) are in good financial situation.

Q.No	Country	Article	Ref. in National Report
53	Canada	Article 10	Sections 2.6.1 & 2.6.2, pages 23-25

Question/ Comment: Under section 2.6.1, paragraph 3 states that “At the Loviisa and Olkiluoto nuclear power plants, actions have been taken to emphasize high level safety culture and to further develop it.” One example is given (the rate of annual investment shows a trend towards safety). What are some other examples of actions taken? Similarly, under section 2.6.2, the report states “Several measures have been implemented at the Loviisa plant for maintaining and developing safety culture.” Please indicate what some of these measures are.

Answer: Olkiluoto has implemented an IAEA based safety culture self assessment tool and practice with help from IAEA specialists. Olkiluoto has done the assessment 2004 and 2007. Based on the assessment results the organisation has set objectives for safety culture improvement of which one example is the management's "walk the plant" - procedure. During this procedure the managers regularly discuss safety issues, using safety equipment, noticing risks etc., with the personnel in their own work environment.

In Loviisa the site is divided to management responsibility areas, which are reviewed. "Walk the plant" - procedure have given in Loviisa many developing ideas especially for maintenance - there have been changes in routines and procedures, and improvements in the guidance. Also the renewal of the training (extra courses concerning work safety and how for example electrical works are done in Loviisa environment) has had a positive effect on the safety culture. But there is still some challenges left in the integration of the work, radiation and nuclear safety training. In 2006 as a part of the licensing renewal process Loviisa power plant has carried out self assessment of safety culture. The assessment was based on IAEA's ASCOT-model.

Q.No	Country	Article	Ref. in National Report
54	Germany	Article 10	page 23, 2.6

Question/ Comment: In this article a lot of aspects of nuclear safety are highlighted and the improvement of safety culture is described, but an overriding priority to safety is not mentioned.
Is it intended to improve safety culture in a way that safety has an overriding priority as described in GS-R-3?

Answer: The principle of priority to safety is met by a sum of legal and regulatory requirements. In the change of the Nuclear Energy Act currently already in the Parliament processing, the principle of priority to safety is laid down explicitly in Nuclear Energy Law.

Q.No	Country	Article	Ref. in National Report
55	Germany	Article 10	page 23, 2.6.1

Question/ Comment: In Article 10 safety culture is pointed out as an important issue. It is described, that the top level inspection of the periodic inspection programme, called “Safety Management”, includes an assessment of safety culture issues and quality management.
How does STUK assess the level of safety culture at the licensees?
Are there indicators available?
Please provide more information about insights of the inspections.

Answer: Basis is in Finnish regulations:
• Decision of the Council of State on the general regulations for the safety of nuclear power plants (395/91), Section 4 (http://www.edilex.fi/stuklex/en/lainsaadanto/19910395)
• Regulatory Guide YVL 1.4 ‘Management systems for nuclear facilities’, 9 Jan 2008 (English translation is under preparation)

STUK’s safety culture assessment includes:

• Inspections and audits
Safety culture is included in STUK’s inspection programme. STUK evaluates the safety culture and quality management in the A level inspection based on mainly the operators safety and quality targets, indicators and achievements. The important question is how organisations systematically plan and manage the development of safety. As input for the A level inspection serves also the B and C level inspection observations concerning direct or indirect links to safety culture and quality management. If there e.g. has happened some incident, the inspection may focus on how the top level management has dealt with situation and how they will prevent future occurrences. Interviews are often included in inspections.

Sometimes STUK also may review the operator’s results of internal surveys or self assessments. The assessment of safety culture is one development area also for STUK.

STUK is also participating to audits to the vendors or manufacturers as necessary.

• Investigation of deviations and events
STUK is reviewing all the reported events and assessing the licensee’s competence to learn the lessons from event and incidents and systematically plan and manage the development of safety.

• Indicator system
STUK’s indicator system includes mostly indirect measures for following up the safety culture. E.g. investments, incidents by non technical causes, defects and corrective actions etc.

• Continuous oversight
STUK has a database for collecting all daily/weekly reported observations concerning organizational issues. Conclusions are made regularly (monthly). Annual review is made in the turn of the year. Safety culture is part of this work. This includes gathering of observations about licensee organisation from several sources and follow up of weak signals and latent organisational factors.

Q.No	Country	Article	Ref. in National Report
56	Germany	Article 10	

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 1. Both licensees are implementing an integrated quality and safety management systems.
2. Basis for quality and safety management system is Finnish legislation and regulations. IAEA Safety Requirements are covered.
3. Implementation is obligatory and required by STUK. Guide YVL 1.4 “Management systems in nuclear facilities”, published 9 January 2008, states the requirements.
4. Approvability of quality and safety management system is handled in the stages of the construction license the operating license. Modifications to the management systems shall be submitted to STUK for approval during construction and operation. Management system is evaluated as a part of regulatory oversight.
5. In addition to regulatory reviews the WANO peer reviews and IAEA OSART Missions have occasionally carried out.
6. Key elements of safety management system cover, as a minimum,
- Planning, implementation, maintenance and improvement of the management system
- Safety culture
- Safety and quality policy
- Grading of the application of management system requirements
- Documentation of the management system
- Licensee responsibility
- Management responsibility
- Planning of operations
- Resource management
- Process implementation
- Assessment and improvement (day-to-day monitoring, self-assessment, independent assessment and management review)
- Management of non-conformances and corrective and preventive actions
- Continual improvement of management system.

Q.No	Country	Article	Ref. in National Report
57	Germany	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 The principle of priority to safety is met by a sum of legal and regulatory requirements. In the change of the Nuclear Energy Act currently already in the Parliament processing, the principle of priority to safety is laid down explicitly in Nuclear Energy Law.

Q.No	Country	Article	Ref. in National Report
58	Romania	Article 10	

Question/ Comment What measures have been taken by the licensees to encourage the reporting of the low level events, including near-misses? How many such events are reported inside the licensees’ organisations, on an average, per year?

Answer Both licensees (Olkiluoto, Loviisa) encourage workers to report about the low level events (by using for example common training situations, intranet). But it is a challenging task: how to get enough relevant information. One important thing is to process all reports and give feedback about the measures done based on received information. There is also a reporting system which can be used anonymously.

Encouragement¡¦s which are used by the licensees are
ƒ{ adding the visibility of results,
ƒ{ quick feed-back for the source, what to be done.

The low level events are all reported inside the licensees¡¦ organisations. Near-misses are collected in databases and reported as ¡§summary and best practices¡¨ to the organisation by intranet and training.

In 2007, which can be used as average year, Loviisa had 61 low event reports and 161 near-misses. 120 low level events were reported at Olkiluoto in 2007.

Q.No	Country	Article	Ref. in National Report
59	Slovenia	Article 10	P. 23

Question/ Comment: Safety culture has also been an essential topic in STUK's continuous interaction with the licensee. What kind of techniques and methodologies were used in the safety culture assessment in the utilities? Has STUK some agreement with the utilities to perform surveys and interviews, besides regular observation during inspection and common plant oversight programs ?

Answer: Basis is in Finnish regulations:
• Decision of the Council of State on the general regulations for the safety of nuclear power plants (395/91), Section 4 (http://www.edilex.fi/stuklex/en/lainsaadanto/19910395)
• Regulatory Guide YVL 1.4 'Management systems for nuclear facilities', 9 Jan 2008 (English translation is under preparation)

STUK's safety culture assessment includes:

• Inspections and audits
Safety culture is included in STUK's inspection programme. STUK evaluates the safety culture and quality management in the A level inspection based on mainly the operators safety and quality targets, indicators and achievements. The important question is how organisations systematically plan and manage the development of safety. As input for the A level inspection serves also the B and C level inspection observations concerning direct or indirect links to safety culture and quality management. If there e.g. has happened some incident, the inspection may focus on how the top level management has dealt with situation and how they will prevent future occurrences. Interviews are often included in inspections.

Sometimes STUK also may review the operator's results of internal surveys or self assessments. The assessment of safety culture is one development area also for STUK.

STUK is also participating to audits to the vendors or manufacturers as necessary.

• Investigation of deviations and events
STUK is reviewing all the reported events and assessing the licensee's competence to learn the lessons from event and incidents and systematically plan and manage the development of safety.

• Indicator system
STUK's indicator system includes mostly indirect measures for following up the safety culture. E.g. investments, incidents by non technical causes, defects and corrective actions etc.

• Continuous oversight
STUK has a database for collecting all daily/weekly reported observations concerning organizational issues. Conclusions are made regularly (monthly). Annual review is made in the turn of the year. Safety culture is part of this work. This includes gathering of observations about licensee organisation from several sources and follow up of weak signals and latent organisational factors.

Q.No	Country	Article	Ref. in National Report
60	Sweden	Article 10	Section 2.6.1

Question/ Comment: It is mentioned that the decision 395/1991 provides that an advanced safety culture shall be maintained when designing, constructing and operating a nuclear power plant. Is the concept of an advanced safety culture further defined and elaborated in other regulatory documents? What are currently the main instruments for STUK and the utilities respectively to assess the safety culture of the operating organizations?

Answer: Basis is in Finnish regulations:
• Decision of the Council of State on the general regulations for the safety of nuclear power plants (395/91), Section 4 (http://www.edilex.fi/stuklex/en/lainsaadanto/19910395)
• Regulatory Guide YVL 1.4 'Management systems for nuclear facilities', 9 Jan 2008 (English translation is under preparation)

STUK's safety culture assessment includes:

• Inspections and audits
Safety culture is included in STUK's inspection programme. STUK evaluates the safety culture and quality management in the A level inspection based on mainly the operators safety and quality targets, indicators and achievements. The important question is how organisations systematically plan and manage the development

of safety. As input for the A level inspection serves also the B and C level inspection observations concerning direct or indirect links to safety culture and quality management. If there e.g. has happened some incident, the inspection may focus on how the top level management has dealt with situation and how they will prevent future occurrences. Interviews are often included in inspections.

Sometimes STUK also may review the operator's results of internal surveys or self assessments. The assessment of safety culture is one development area also for STUK.

STUK is also participating to audits to the vendors or manufacturers as necessary.

• Investigation of deviations and events
STUK is reviewing all the reported events and assessing the licensee's competence to learn the lessons from event and incidents and systematically plan and manage the development of safety.

• Indicator system
STUK's indicator system includes mostly indirect measures for following up the safety culture. E.g. investments, incidents by non technical causes, defects and corrective actions etc.

• Continuous oversight
STUK has a database for collecting all daily/weekly reported observations concerning organizational issues. Conclusions are made regularly (monthly). Annual review is made in the turn of the year. Safety culture is part of this work. This includes gathering of observations about licensee organisation from several sources and follow up of weak signals and latent organisational factors.

Q.No	Country	Article	Ref. in National Report
61	Sweden	Article 10	Sections 2.6.2, 2.6.3

Question/ Comment: In sections 2.6.2 and 2.6.3 information is given about developing safety culture at the Loviisa and Olkiluoto NPPs. It seems from this information that there are no dedicated safety culture programs at the plants and no routine follow up by use of for instance safety culture indicators. Please explain the situation.

Answer: STUK refers to IAEA Safety series No 75-INSAG-4 and IAEA safety report INSAG-15 in STUK's regulatory document YVL 1.4 concerning the management system and safety culture. See answer 55 concerning instruments for assessing safety culture.

Q.No	Country	Article	Ref. in National Report
62	Switzerland	Article 10	page 23, 2.6.1

Question/ Comment: What are the Safety Culture issues to be assessed? What are the evaluation criteria?

Answer: This is still a development area for STUK. STUK refers to IAEA Safety series No 75-INSAG-4 and IAEA safety report INSAG-15 and follows also up the safety culture by indirect measures such as annual investments on plant improvements, incidents etc.

Q.No	Country	Article	Ref. in National Report
63	United States of America	Article 10	2.6.2

Question/ Comment: Based on challenges at Loviisa plant, does Finland plan to assess Olkiluoto units to determine whether they face similar challenges?

Answer: These challenges were identified during OSART-mission but similar findings were also found during Wano Peer Review at Olkiluoto plant. STUK is following up the status of the decided corrective actions at Olkiluoto NPP with periodic inspections.

STUK is reviewing regulations concerning operations and these lessons are taken into account in this process.

Generally speaking all the relevant findings or safety problems are always discussed with both utilities. STUK has an oversight meeting monthly, where all the findings, failures and events are discussed. Based on safety significance and whether the issue is relevant to the other licensee STUK decides the needed actions.

Q.No	Country	Article	Ref. in National Report
64	Czech Republic	Article 11.1	

Question/ Comment: How does your licensee ensure qualification of the contractors?

Answer The qualification approach is covering four types of contractors:
- On-site contractors at the operating power plants who shall follow the quality and safety management system by the licensee. The licensee is responsible for checking their background and qualifications and for making these contractors familiar with the approach implemented on site.
- On-site contractors at the plant under construction who shall follow the quality and safety management system (project management system) by the plant supplier and where a duty of licensee is to evaluate and to demonstrate to the regulatory body that contractors are qualified and complying with approved procedures.
- Off-site contractors (design organisations, manufacturers, inspection organisations etc.) at the operating power plants who are occasionally audited. In addition, plenty of documents review, manufacturing supervision etc. is used to evaluate qualification of a company and its staff competence.
- Off-site contractors (design organisations, manufacturers, inspection organisations etc.) at the plant under construction, qualifications are to be evaluated and demonstrated to the regulatory body by the licensee.

Q.No	Country	Article	Ref. in National Report
65	United States of America	Article 11.1	

Question/ Comment The report states that both utilities use a systematic approach to train personnel. Operator training is described. However, programs for technical personnel (i.e. maintenance, engineering, radiation protection, chemistry) are only briefly referred to in Article 11 and it is not clear what the utilities are doing to provide training to individuals in these roles. What is being done in Finland to provide training to personnel who are not operators?

Answer As presented in the National Report, the competence requirements of the personnel are presented in the Training Manual of NPP's. The competence requirements are based on the duties of each vacancy, on responsibility areas and on regulatory requirements related to the duties in question. The competence requirements define the basic education of a person and the initial and refresher training to be given. Initial and refreshing training depend on the position in the organization. For the lower organizational levels (workers) training is based on the on-the-job training methods under the guidance of specifically trained, experienced workers, who provide familiarization with the duties of the newcomer, in addition to the class room training provided on the plant and system knowledge, organization etc. If necessary, extra methodical training for working methods is provided outside the company. For higher level positions, the needed training is determined on the individual basis depending on the former education and experience as well as training provided in other, previous positions. For general nuclear safety knowledge, plant and system knowledge, organizational knowledge etc. there are classroom courses available, and/or individual on-the-job training is provided. The Training Manuals of NPP's provide more detailed information on the training programmes.

Q.No	Country	Article	Ref. in National Report
66	France	Article 11.2	p. 28

Question/ Comment Could Finland provide more details on the measures identified by the working group (set up by the Ministry of Trade and Industry) to compensate the loss of competencies and experience due to retirement of many experts?

Answer The most important measure to compensate the loss of competency has been long-term research programmes. SAFIR2010 research programme on nuclear power plant safety for the years 2007-2010 is strongly based on the chapter 7a, “Ensuring expertise”, of the Finnish Nuclear Energy Act. The programme is the newest link in chain of public research programmes on nuclear safety that have proved to excel in order to maintain and develop know-how in Finland. The steering group of SAFIR2010 consists of representatives from Radiation and Nuclear Safety Authority (STUK), Ministry of Employment and the Economy (MEE), Technical Research Centre of Finland (VTT), Teollisuuden Voima Oy (TVO), Fortum Power and Heat Oy, Fortum Nuclear Services Oy (Fortum), Finnish Funding Agency for Technology and Innovation (Tekes), Helsinki University of Technology (HUT) and Lappeenranta University of Technology (LUT).
SAFIR2010 research programme is divided in eight research areas, which are:
1. Organisation and human factors
2. Automation and control room
3. Fuel and reactor physics
4. Thermal hydraulics
5. Severe accidents
6. Structural safety of reactor circuit
7. Construction safety
8. Probabilistic safety analysis (PSA)

In 2008 there are altogether 30 research projects. The total volume of the programme in 2008 is planned to be approximately 44 person years and 6.5 M€.

Also modernisation projects in NPPs have been very useful way of transfer knowledge to younger generation. And the third main measure is international cooperation within nuclear community i.e IAEA, EU, OECD and also Scandinavian research programme NKS.

Q.No	Country	Article	Ref. in National Report
67	Korea, Republic of	Article 11.2	Section 2.7.2

Question/ Comment: (Article 11-2, Section 2.7.2)
National report states that two five weeks training courses were provided to train newcomers in Finland during 2005-2006.
1) Is this training to newcomer is mandatory and based on the established regulatory requirements or just through voluntary co-operation?
2) What kind of regulations does Finland have concerning the training of newcomers in the filed of nuclear safety ?

Answer: 1. This training course is not mandatory. Annually, there has been about 50 participants in the training course. Most participants are from the power companies representing new technical personnel and from regulatory body (about 10 persons annually). The implementation of the training course continues on annual basis. There is development effort going on with the neighbouring countries to provide career development / refreshing training for more experienced personnel (nuclear manager course).
2. Finnish regulatory requirements for training in the field of nuclear safety are presented in the Guides YVL 1.6 and 1.7 that are available in STUK webpage (www.stuk.fi) in English.

Q.No	Country	Article	Ref. in National Report
68	Netherlands	Article 11.2	

Question/ Comment: The last decade there was internationally a growing concern about the effects of the liberalization of the electricity market in Europe on plant safety. E.g. meaner and leaner organizations were sometimes perceived to be a threat of shifting priority from safety to economics.
Is a gradual decline in plant staff a visible trend in Finland? Are there other effects of market changes visible in the operation of Finnish plants?

Answer: The market changes are affecting the business environment and management of the NPPs but STUK has yet not seen any direct and remarkable negative effects of market changes. The economical situation has been very good and therefore the licensees have not been forced to cut down costs significantly or investments.

STUK has a safety performance indicator of the investments in plant maintenance and modification in current value of money adjusted by the building cost index. It shows no decreasing of investments, an extensive modernisation projects has been carried out and planned for 2000 century.

Some effects can be seen after liberalisation. The utilities have become more conscious about costs of contracted work and the spare parts. In some cases utilities have had difficulties to get spare parts quickly enough or the contracted work has not been satisfactory. Liberalisation and stock markets are also requiring the utilities to report events affecting production very rapidly. One obvious effect is that companies are owning shares of other companies running NPPs. That can be seen as good possibility to share operational experience and working practices. It can also have negative impact when comparing cost and profits with different types of plants in different operating environments. Spare part management has also been a challenge for plants in this new situation.

Both utilities have been operating the plant with very slim and effective organisations and there is not much room for downsizing without outsourcing the core competencies. In both utilities there has been shortage in some disciplines at the plants but that has not been due to market liberalization.

TVO is building a new NPP and they are hiring a lot new personnel and they are also investing remarkable to the running units to operate them longer and original planned lifetime. Also Fortum Ltd is planning to built a new NPP and have been hiring personnel for the project.

More detailed information is available in the publication of the EC ‘Regulatory Assessment of the Effects of Economic Deregulation of the Nuclear Industry’ (http://ec.europa.eu/energy/nuclear/publications/doc/eur20431.pdf).

Q.No	Country	Article	Ref. in National Report
69	Netherlands	Article 11.2	

Question/ Comment: How do the licensees demonstrate to the regulator, that they have sufficient numbers of qualified staff to carry out all safety relevant activities during the operating phase on a regular basis?

Answer STUK follows up the sufficiency of personnel resources by different means; often by interviewing personnel during inspections, by observing how the operator achieves different dead lines and time targets, by investigating recourses available during incidents etc. The best indicator for the moment is a problem free operation. And when problems occur the licensee has to prove that the problem was not depending on lack of resources. STUK has now demanded a quite detailed personnel plan concerning the Olkiluoto 3 plant.

Q.No	Country	Article	Ref. in National Report
70	South Africa	Article 11.2	General

Question/ Comment With the resurgence of nuclear power worldwide, which could result in competition for experienced human resources (both locally within your country and internationally) what strategies/steps are being taken in your country by both the regulatory body and the operators to ensure that sufficient numbers of qualified staff remain available for all safety-related activities in or for each nuclear installation, throughout its life.

Answer All parties have HR-plans for future and recruitments have been done proactively.

All parties have in-house training programmes to keep competences up-to-date. In Finland we have also co-operated by producing basic professional training course for those who have been recruited either by RB, TSOs or licensees. Until now five courses have been carried out, duration of one course is 20 working days and total number of participants is more than 250.

In Finland we have only two technical universities with nuclear programmes. In those the number of students has increased in 20th century.

Q.No	Country	Article	Ref. in National Report
71	United Kingdom	Article 11.2	Page 27

Question/ Comment The report states that both licensees have a systematic approach to training. Substantial training programmes are described, but not in relation to construction and, particularly, commissioning activities. To what extent do TVO have control over the specification of competence and training of its turn-key contractor at Olkiluoto 3?

Answer Regulatory Guides (YVL guides) set requirements for competence and training related to the organisations and individuals performing for example engineering, civil construction pressure equipment manufacturers, inspection organisations and operator training. Licensee has made a plant contract with the contractor in which all YVL guides are referenced. In addition to those, licensee may have other requirements in the plant contract to control the specification of competence and training of its turn-key contractor.

Q.No	Country	Article	Ref. in National Report
72	Korea, Republic of	Article 12	Section 2.8.3

Question/ Comment (Article 12, Section 2.8.3)
“Monitoring and control of the Olkiluoto nuclear power plant” on page 32 states that the I&C modernization projects started in 90’s encompass several systems and TVO plans to continue the modernization of systems during the forthcoming years. What kind of human factors activities (e.g., task analysis, human reliability analysis, human factors verification and validation, etc.) are performed for I&C modernization projects?

Answer The main phases of Olkiluoto I&C modernization started in 90's introduced some changes in the control room layout related to desks and cabinets, changes in the conventional controls of the renewed systems and some more VDU monitoring capacity. The utility started HFE design activities from investigating the main control room design basis and elaborated the conceptual HFE design plan for the latest renewals.
The soft key controls were introduced in the years 2005 and 2006 for the new turbine process I&C. The main control room design requirements are now improved in the FSAR.
Meanwhile during the design phases of the new unit Olkiluoto 3 and the I&C renewal of the Loviisa NPP HFE design process is further developed encompassing besides the conceptual plan such documents as the main control room (HFE) quality plan, requirement documentation, specifications, V&V plans and result documentation. The referenced guidelines are IEC 60964 based standards and NUREG-711.
Drawing up such analyses like function analysis and task analysis has not yet been really successful and better performance in that area is awaited.

Q.No	Country	Article	Ref. in National Report
73	Lithuania	Article 12	

Question/ Comment What is the role of STUK to ensure that human factor considerations are taken into account in early stage of design process (for new NPP’s)?

Answer Decision of the Council of State on the general regulations for the safety of nuclear power plants requires to take the human factors into consideration during design process.(The decision (395/91), Section 19: Avoiding human errors. “Special attention shall be paid to the avoidance, detection and repair of human

errors. The possibility of human errors shall be taken into account both in the design of the nuclear power plant and in the planning of its operation so that the plant withstands well errors and deviations from planned operational actions.")

The normal review and assessment process of the detailed design documents should assure the mentioned requirements will be fulfilled. There is no specific HOF review of the documents.

Q.No	Country	Article	Ref. in National Report
74	Pakistan	Article 12	Article 12 , section 2.8.2, Page 31

Question/ Comment: It is stated that "Due to the inherent characteristics of the Loviisa plant, the operators will have usually more time for consideration in a transient situation than at other types of nuclear power plants" it may be explained what are inherent characteristics of the Loviisa plant that makes it higher than other power plants in transient situation.

Answer: There is more water/MW in the primary side and in the steam generators of the VVER-440 plans than in the other PWR's. Also reactor core characteristics i.e. reactor physical feedback mechanisms are more negative that other PWR's. Based on these facts there are more time for operator to consider the situations before doing decisions.

Q.No	Country	Article	Ref. in National Report
75	Switzerland	Article 12	pages 30 - 33

Question/ Comment: The described approach on human factors focuses very strongly on human errors, i.e. on the limitations of human beings. Are the "human strengths" not considered to be an important issue for HF related activities (from the regulatory as well as from the licencee side)?

Answer: This article focuses on managing risks and therefore the focus is more on human shortcomings. Human strengths are indeed an important issue and should be emphasised especially concerning spreading best practices.

Q.No	Country	Article	Ref. in National Report
76	Switzerland	Article 12	pages 32 - 33, 2.8.3

Question/ Comment: What kind of oversight activities were performed in the HF area (particularly relating to Human Factors Engineering aspects) concerning the planning and construction of the Olkiluoto 3 NPP?

Answer: Decision of the Council of State on the general regulations for the safety of nuclear power plants requires to take the human factors into consideration during design process.(Decision (395/91) Section 19:Avoiding human errors. "Special attention shall be paid to the avoidance, detection and repair of human errors. The possibility of human errors shall be taken into account both in the design of the nuclear power plant and in the planning of its operation so that the plant withstands well errors and deviations from planned operational actions.")

The normal review and assessment process of the detailed design documents and inspection process should assure the mentioned requirements will be fulfilled. There is no specific HOF review of the documents.

Q.No	Country	Article	Ref. in National Report
77	Romania	Article 13	page 34, sections 2.9.2 & 2.9.3

Question/ Comment: Do the licensees have any plans to make the transition to a management system based on processes, taking account of the IAEA GS-R-3?

Answer: Olkiluoto has a management system that is partly based on processes. The functions are described as process models. It remains to be seen how Olkiluoto evaluates their management system according to the new YVL 1.4 (ref. IAEA GS-R-3) regulation document, which more clearly than before demands a process based management system.

Q.No	Country	Article	Ref. in National Report
78	Slovenia	Article 13	p. 34

Question/ Comment: The Quality Manual prepared for the regulatory control of the use of nuclear energy has been benchmarked with other regulators under the auspices of OECD/NEA work¬ing groups and through bilateral contracts. Which international standards were the basis for the STUK's Quality Manual?

Answer: STUK has used ISO 9001 and ISO 9004 when developing latest version of its' quality manual. In the 1970' when first quality manual was issued ISO standards were used among others. Also requirements on IAEA GS-R-3 have been considered and a self assessment how the requirements been met was carried out in 2006.

Q.No	Country	Article	Ref. in National Report
79	Switzerland	Article 13	page 33

Question/ How are the IAEA Requirements GS-R-3 considered in the regulatory framework on Quality Assurance and

Comment Management Systems?

Answer STUK has assessed how its' own quality system meets requirements in IAEA GS-R-3 by carrying a self assessment. IAEA requirements and guides have also been used as referenced when developing regulatory guides (YVL 1.4, The Management Systems for Nuclear Facilities).

Q.No	Country	Article	Ref. in National Report
80	United Kingdom	Article 13	Page 34

Question/ Comment Reference is made in the report to the quality manual of Okilouoto project for the construction phase. To what extent does this document deal with the processes for managing the commissioning activity in addition to the assurance of quality of equipment and installation?

Answer TVO's Quality Manual for Olkiluoto 3 Project as well as the the OL3 quality plan of the plant supplier contains also all the requirements and organizational processes for the commissioning phase of the unit. TVO's Quality Manual and the quality plan of the plant supplier are supplemented with the relevant commissioning plans and the commissioning manual of the plant supplier.

Q.No	Country	Article	Ref. in National Report
81	Canada	Article 14.1	Section 2.10.1, p.35

Question/ Comment How is STUK addressing generic action items and safety issues in the licensing of Olkiluoto 3?

Answer In the construction license phase, licensee was required to show evidence on how operating experience, research results and advancement of science and technology have been taken into account in the design of Olkiluoto 3. During construction, STUK has inspected licensee's process to evaluate emerging operating experience from operating power plants (information via IRS system, WANO and other sources) and how this is discussed with the contractor from plant design point of view.

Q.No	Country	Article	Ref. in National Report
82	Canada	Article 14.1	Section 2.10.1, p.36, paragraph 2

Question/ Comment The report states that "The new requirements mean in practice that all safety significant plant modifications have to be assessed by a unit which is independent of the design and implementation of the modification … STUK has also established its own plant modification database, … ". To which organization does this "unit" belong? How is this unit qualified to perform the assessment? Is STUK's database shared with other organizations? What kind of trending is reported in STUK's biannual reports?

Answer The unit is part of the licensee's organisation, independent from design or implementation of the modifications; for example experts /head of operation, maintenance, safety (nuclear, radiation, work) and QA. This unit is a part of licensees' modification -process, which is assessed by STUK in Inspection program.

STUK's database is not shared with other organizations at the moment. Licensee has the responsibility to sustain plant modification database of their own. STUK's database is used to help coordination of inspection of modifications for example for the Periodic Safety Review.

In STUK's biannual and annual reports modifications are a basic topic. As an indicator the investments of licensees is under follow up. The situation has been good in Finnish plants - investments are done continuously (every year) according their long-term programs. Programs are updated and enough extensive to ensure operation and safety for plans lifetime.

Q.No	Country	Article	Ref. in National Report
83	Canada	Article 14.1	P.37, Section 2.10.1, last paragraph

Question/ Comment In addition to VTT, who are the foreign institutes that STUK has asked to perform independent transient and accident analyses on the Olkiluoto 3 NPP? Why did STUK consult with these foreign institutes?

Answer We have used German company called ISAR as a consultant in some selected safety issues including transient and accident analyses. At the moment we are doing cooperation with Swiss laboratory called PSI on that area.

In some selected important safety issues we considered that we need "third independent opinion" on the issue. In that way we will have better grounds to do our decisions.

Q.No	Country	Article	Ref. in National Report
84	Canada	Article 14.1	P.37, Section 2.10.2, paragraph 2

Question/ Comment What were the "new" regulatory requirements that were taken into account by Fortum when revising its final Safety Analysis Report for the relicensing of the Loviisa 1 and 2 NPPs?

Answer The “new regulatory requirements” has to do with updated regulatory guide YVL 6.2 “Design bases and general design criteria for nuclear fuel”. When the guide was updated, requirements for categorisation of the postulated initiated events were changed (one new event category was established) and also acceptance criteria were defined for new classes. Because of the changes, licensee had to re-categorise postulated initiated events and also re-analyse to show that they are in compliance with acceptance criteria in the new classes. The Guide YVL 6.2 can be found in English from the web (http://www.edilex.fi/stuklex/en/lainsaadanto/saannosto/YVL6-2)

Q.No	Country	Article	Ref. in National Report
85	France	Article 14.1	p. 38, § 2. 10.3 and p 71, § 3 and p. 83

Question/ Comment Large information about Risk-Informed approach is provided. Could Finland indicate:. for operating plants, has a power uprate any impact on PSA results?. for Olkiluoto 3, what are the main findings of the design PSA (does the PSA led to design improvements)?

Answer 1) Power uprate typically reduces e.g. the time available for certain operator actions due to higher thermal power and decay heat. The risk impact of shortened time windows depend on the accident progression and plant characteristic. For operating plants in Finland, the risk increase due to power uprate was not significant. In addition, several safety improvements were implemented during the power uprate and modernization project, which eventually resulted in a decrease in total risk of a severe accident.

2) Radiation and Nuclear Safety Authority (STUK) combines insights from both the deterministic and probabilistic analyses in decision making process. Several design modifications were required starting from the original EPR concept. For example following issues were improved
- the capacity of safety systems
- diversity in system and safety function level
- provisions against internal fires and floods
- provisions against external hazards, especially harsh weather conditions
- diversity in emergency power supplies
- severe accident management.

Q.No	Country	Article	Ref. in National Report
86	Japan	Article 14.1	p.38, right column

Question/ Comment 2.10.2 Deterministic safety assessment
Transient and accident analysis of the Olkiluoto 3, 2nd and 3rd Para. say;
“---The events with potential risk are classified in Design Basis Conditions and Design Extension Conditions.------“ and”----The representative events are considered as Design Extension Conditions.”
The deterministic design of the safety systems is supported by the safety analysis based on the Design Basis Conditions. Beyond this analysis, the design basis is extended to the Design Extension Conditions, in which the limited numbers of representative events are analyzed to justify the design.
(1) On what basis are the representative events selected? Is it based on the probabilistic analysis?
(2) On what basis is the justification in the case of the Design Extension Conditions made?
The criteria for justification in the case of the Design Extension Conditions are to be different from those of the Design Basis Conditions.

Answer Design extension conditions (DEC) are defined also in WENRA reference requirements as well as in European utility requirements. Our definition for DEC is almost the same as in these two documents except that severe accidents are separated from that into an independent design basis category. DEC includes some complex sequences such as scenarios including common cause failures i.e total loss of feedwater, LOCA together with the complete loss of one emergency cooling system, loss of ultimate heat sink, total loss of component cooling system etc. Best estimate assumptions are used in these calculations but the acceptance criteria are similar that in DBA. These DECs are also design bases for diverse safety systems. In our regulations we require not only redundancy but also diversity for the safety systems.

Q.No	Country	Article	Ref. in National Report
87	Russian Federation	Article 14.1	Subsection 2.10.2 (page 38)

Question/ Comment The Report says that “the validation process of codes used for design and licensing calculations is going on”.
1) What proves the reliability of Deterministic Safety Analysis (DSA)?
2) How does the DSA take into account uncertainty of trailing correlations used in codes for such analyses?

Answer Requirements for code validation are given in one of our guides YVL 2.2 at general level but main idea in code validation is that codes which are used for licensing of NPP must be validated in the parametric area where they are intended to use. In the code validation we follow similar practices which have been given in some OECD/CSNI code validation documents including validation matrixes. Uncertainty analysis is elementary part of our safety analysis which is required in Guide YVL 2.2.

Q.No	Country	Article	Ref. in National Report
88	Slovakia	Article 14.1	

Question/ Comment: The 5th NPP unit in Finland is according to the definition of nuclear installation not subject to the Convention on Nuclear Safety. Slovakia would appreciate basic information on the safety concept of this new unit in particular those regulatory requirements which are going beyond the requirements of the operated NPPs.?

Answer: In our new guides there are some requirements which existing, operating plants do not fully fulfill. The most important of them are severe accident requirements, and some requirements related to external events. All our operating NPPs are backfitted to cope with the severe accident scenarios as far as it is technically feasibly. OL 3 has design so that it fulfills fully our new requirements.

Q.No	Country	Article	Ref. in National Report
89	Ukraine	Article 14.1	Para 2.10.1, page 35

Question/ Comment: Is PSA a part of the SAR as recommended by IAEA Safety Guide GS-G-4.1 “Format and Content of the Safety Analysis Report for Nuclear Power Plants”?

Answer: According to the Nuclear Energy Decree (Section 36) the PRA (PSA) is required together with the PSAR and FSAR. In practise, the PRA is a separate document but both of them, i.a., belong to the mandatory licensing documents.

Q.No	Country	Article	Ref. in National Report
90	United Kingdom	Article 14.1	Page 36

Question/ Comment: The report states that “all safety significant plant modifications have to be assessed by a unit which is independent of the design and implementation of the modification”. By what criteria does STUK judge the adequacy of such independence?

Answer: In our guide YVL 2.0 we have a requirement which states that "A conceptual design plan shall be drawn up of modifications to large system entities or systems in an operating nuclear power plant. The plan is to contain facts included in the preliminary safety analysis report and it shall also demonstrate that the design process was carried out by a competent organisation and that all information exchange needed during the design process was realised. The licensee shall assess the acceptability of the conceptual design plan by audits conducted prior to starting detailed systems design. Inspections shall be conducted throughout the design process. As regards extensive safety significant modifications or modifications requiring special know-how, the licensee shall consider whether to commission their independent safety assessment to an assessor entirely independent of the licensee’s organisation. The minimum competence required of individuals and organisations conducting design audits and independent safety assessments is that which is required in the design task, and it shall have been proven in practice. After the assessments have been carried out the licensee shall satisfy himself of the acceptability of the design by safety assessments based on sufficient own know-how."

Q.No	Country	Article	Ref. in National Report
91	Pakistan	Article 14.2	Article 14,Section 2.10.5, Page 40

Question/ Comment: Does STUK, use safety analysis codes other than those used by the plant owners, for its independent analysis? What is the basis of the validation of the codes used by STUK?

Answer: According to our rules those codes which are used in our independent safety analyses shall be independent from those which licensee has been used in their analyses. For instance in LBLOCA analyses our consultants have used APROS code developed by VTT and ATHLET code developed by GRS.

We are using same validation requirements (QA) for our independent or our consultant's codes that we require for the utility codes.

Q.No	Country	Article	Ref. in National Report
92	Czech Republic	Article 15	

Question/ Comment: Is it possible to describe feed back process in the field of radiological events at Finnish nuclear power plants and the process of the radiologically risky work planning?

Answer: Radiological events are treated as all safety related NPP events (in line with YVL Guide 1.5, p. 63 in the national report). In evaluation, radiation protection related criteria are taken from relevant YVL 7 Guides.

YVL 7.9 Guide gives the requirements of radiological work advance planning procedure. Plant instructions describe further the actions of NPP RP staff how to prepare radiation work permits. Most demanding radiation work plans of annual maintenance are sent in advance to STUK for information. STUK may consequently inspect these work arrangements on-site.

Q.No	Country	Article	Ref. in National Report
93	France	Article 15	p. 45, § 2.11.1

Question/ Comment: In the paragraph “The activity levels in the primary circuit water have been reasonably low”. could Finland specify what is meant by reasonably low ?

Answer: The activity concentrations of fission products in the coolant water have been reasonable low because fuel activity leakages have been minor (typically no leaking fuel rods at Loviisa PWRs and one leaking fuel rod at Olkiluoto BWR reactors in an operational year). The activity concentrations of corrosion products are low taking into account their impact on the occupational doses and the discharges from the plants.

The average I-131 concentrations in the reactor water of Loviisa 1 and 2 (PWR) were approximately 0,2 Bq/ml during power operation in 2007. The corresponding Co-60 concentrations were approximately 0,07 Bq/ml. At Olkiluoto 1 and 2 (BWR) the corresponding I-131 concentrations were approximately 0,04 Bq/ml and 0,4 Bq/ml, respectively, and the corresponding Co-60 concentrations approximately 4 Bq/ml.

Q.No	Country	Article	Ref. in National Report
94	France	Article 15	p. 46, § 2.11.2

Question/ Comment: In the paragraph “Some further actions … during outage”, could Finland specify what are those actions ?

Answer: The actions requested concerned e.g. better warning signs in the radioactive pipelines etc, clear information on the radiation situation within the working areas already at the entrance point, enhanced radiation protection control of the work places incl. QA visits by radiation protection staff, efficient contacts from radiation protection unit to the key contractors work teams, development of better use of remote technology i.e. videos, digital photos, radio communication in future outages.

Q.No	Country	Article	Ref. in National Report
95	France	Article 15	p. 47, § 2.11.4

Question/ Comment: In the paragraph “Both nuclear power plants … the environment”. could Finland specify what are those measures ?Regarding tables 3&4, could Finland specify if there are limits for carbon 14? Could Finland give the limits for airborne and liquid effluents ?Does Finland confirm that tritium measures are performed in the airborne effluents ? Is carbon 14 measured in airborne effluents?

Answer: Carbon 14 and tritium are continuously measured in the airborne effluents of Loviisa and Olkiluoto NPPs. There are no specific discharge limits for them in the airborne effluents for the because the carbon 14 and tritium discharges are stable and quite small compared to the dose limit for an individual of the population. Tritium is measured in the liquid effluents of Loviisa and Olkiluoto NPPs and there are discharge limits for it in the liquid effluents.

The annual discharge limits are the following:

Olkiluoto NPP

Airborne effluents/Stack
Noble gases 17700 Kr-87 equiv. TBq
Iodine 114 I-131 equiv. GBq

Liquid effluents/Cooling water channel
Tritium 18300 GBq
Other beta emitting radionuclides 296 GBq

Loviisa NPP

Airborne effluents/ Stack
Noble gases A1 x 22000 Kr-87 equiv. TBq
Iodine B1 x 220 I-131 equiv. GBq
Airborne effluents/ Roof (turbine building)
Noble gases A2 x 440 Kr-87 equiv. TBq
Iodine B2 x 14 I-131 equiv. GBq

Liquid effluents/ Cooling water channel
Tritium 150000 GBq
Other nuclides (based on I-131) C x 890 GBq

In which A1 + A2 + C < 1
B1 + B2 + C < 1

Q.No	Country	Article	Ref. in National Report
96	Korea, Republic of	Article 15	Section 2.11.1

Question/ Comment (Article 15, Section 2.11.1)
In relation to Section 2.11.1, it is stated that Olkiluoto and Loviisa nuclear power plants have developed and implemented plant-specific ALARA programs and one of key issues in this ALARA implementation is real-time dosimetry.
- Please, explain the detailed real-time dosimetry such as the method and procedure.

Answer Real-time electronic dosimeter systems are in addition to the official TL dosimeters. There are sufficient amount of electronic dosimeters at the plant for the maximum number of employees in annual maintenances. Thus the collective doses of single work phases and categories are fully coped with these, making possible the follow up of incurring doses by RP personnel, and every single worker him/herself. The entrance points are typically the places where real-time dosimeters are kept when not in use at the working area.
Testing and maintenance are described in the radiation protection staff instructions. External workers are trained to use these dosimeters when they arrive at the plant for annual maintenance.

Q.No	Country	Article	Ref. in National Report
97	Netherlands	Article 15	p.45

Question/ Comment What is the reason for a periodic approval of the personal dosimetry services in Finland?
Are there beside the dosimetry services of the power plants independent official dosimetry services in Finland?

Answer Radiation Act in force gives a requirement for a periodic approval of the legally approved dosimetry services.

In Finland there is a commercial dosimeter service (Doseco company), which has as the main business duty to provide non-nuclear licensees with approved TL dosimeters and to report the doses of their workers to the central dose register in Finland. Since some years TVO Olkiluoto NPP has also outsourced main part of the on-site dosimeter service routine work to this company.

Q.No	Country	Article	Ref. in National Report
98	Slovenia	Article 15	p. 47

Question/ Comment An outside contracted laboratory collects and analyzes about 350 samples per year from the environment of each NPP.
It is not clearly stated who contracted the laboratory: the operator or the STUK. What is the scope of independent monitoring programme performed on behalf of the regulatory authority compared to the plant`s programme? Does the independent monitoring include both, i.e. samples of radioactive effluents and environmental radioactivity?

Answer The licensee is responsible for monitoring radioactivity in the environment of NPP and thus the licensee contracts the laboratory. STUK’s department Nuclear Reactor Regulation approves the radiation monitoring programme and inspects environmental monitoring activities as part of the on-site regulatory control.

STUK may organise when needed independent environmental monitoring including both i.e. samples of radioactive effluents and environmental radioactivity by using laboratories, which do not take part of the NPP’s monitoring programme.

Also a regular intercalibration exercise of the NPP laboratories and some independent laboratories are executed on real samples of the power plants.

Q.No	Country	Article	Ref. in National Report
*	Argentina	Article 16.1	p.49

Question/ Comment Concerning the increase in the sea water level in the Gulf of Finland (January 9 – 2005), could Finland give more detail information on lessons learnt by STUK and NPP, as well as eventual modifications in systems or procedures coming from the event?.

Answer The event is reported to the IRS-system (report 7751).

4 LESSONS LEARNED:

1. Good communication and cooperation between different authorities is important. The predictions provided by FIMR were fairly accurate and provided useful background information during the situation. The event

emphasizes the need for implementing a unified national duty system for forecasting and/or communication of extreme natural conditions and disasters, including meteorological, oceanographic and seismic events.

2. During exceptional environmental situations there is general interest in the possible effects on nuclear power plant safety, and preparedness to public information is important. During the situation STUK was contacted by the Prime Minister's Office for a report on the situation. STUK was also contacted by other authorities, by the news media and by the general public.

3. It is important that the plant personnel and safety authorities are aware of the design basis of nuclear power plant units regarding external events and the relevant emergency operating procedures. In addition to the nominal design basis, the critical points of the plant and the consequences of exceeding the design basis should be known.

4. The treatment of high seawater level and the description of its possible consequences in the external events PSA (probabilistic safety analysis) was found useful during the incident.

5. The incident revealed some minor discrepancies and some points open to slightly different interpretation in the plant's emergency operating procedures and emergency preparedness guidelines. [- -].

In addition the sea water level has been included to the information coming from the NPP to STUK. NPP has made some corrections to the emergency instructions and emergency preparedness guides concerning the water levels and required actions, including informing STUK. STUK has organised a weather risk seminar 2005 with Marine Research and Meteorological Institute. Weather risk has been also included to Finnish Nuclear Research Programme (SAFIR).

Q.No	Country	Article	Ref. in National Report
99	Czech Republic	Article 16.1	

Question/ Comment: 1/ How often STUK organizes emergency exercises? How often is the licensee obliged to organize emergency exercises? How often are these exercises prepared like the common ones?
2/ Are the technological data from NPP available at STUK crisis staff on-line?

Answer: 1) During the operation the NPP licensee is obliged to organize on-site emergency exercise and other training for emergency organisation every year. Joint exercises between the authorities and the NPP shall be organised with the lead of the State Provincial Authorities at least once every three years.

STUK takes part in these domestic exercises (at least two per year) and also in international exercises concerning nuclear emergencies.

2) For STUK’s situation assessment, the licensee has arranged a system for automatic data transfer and display from the NPP’s computer system to STUK. In provision for a failure or malfunction in the system, a complementary data transfer procedure has also been planned.

All data significant to the assessment of the situation and its progress is transferred. The data transmission system must be capable of supplying information on both the current situation and the previous situation from a sufficiently long time period so that the situation progress can be monitored.

Q.No	Country	Article	Ref. in National Report
100	France	Article 16.1	p.48, § 2.12

Question/ Comment: The following event is described in the report: “On 9 January 2005 an exceptional increase in the sea water level in the Gulf of Finland brought about an emergency standby situation at Loviisa NPP. The plant sent STUK the relevant notices and started up the operation of its own emergency stand-by organisation in order to ensure the safety level of the plant. STUK’s organisation was partly summoned at STUK’s emergency centre to follow the situation and communicate with Loviisa NPP as well as key authorities and partners of co-operation. The sea water level increase of 1,73 m higher than the average caused no leaks into the plant’s rooms or other corresponding phenomena that would endanger the plant’s safety; both reactor units were in normal operation.”Could Finland provide information on the assessment of this event by STUK and on lessons learnt? Could Finland explain why it was not reported to the IRS?

Answer: The event is reported to the IRS-system (report 7751).

4 LESSONS LEARNED:

1. Good communication and cooperation between different authorities is important. The predictions provided

by FIMR were fairly accurate and provided useful background information during the situation. The event emphasizes the need for implementing a unified national duty system for forecasting and/or communication of extreme natural conditions and disasters, including meteorological, oceanographic and seismic events.

2. During exceptional environmental situations there is general interest in the possible effects on nuclear power plant safety, and preparedness to public information is important. During the situation STUK was contacted by the Prime Minister's Office for a report on the situation. STUK was also contacted by other authorities, by the news media and by the general public.

3. It is important that the plant personnel and safety authorities are aware of the design basis of nuclear power plant units regarding external events and the relevant emergency operating procedures. In addition to the nominal design basis, the critical points of the plant and the consequences of exceeding the design basis should be known.

4. The treatment of high seawater level and the description of its possible consequences in the external events PSA (probabilistic safety analysis) was found useful during the incident.

5. The incident revealed some minor discrepancies and some points open to slightly different interpretation in the plant's emergency operating procedures and emergency preparedness guidelines. [- -].

Q.No	Country	Article	Ref. in National Report
101	Hungary	Article 16.1	2.12, p.49

Question/ Comment: "On 9 January 2005 an exceptional increase in the sea water level in the Gulf of Finland brought about an emergency standby situation at Loviisa NPP. The plant sent STUK the relevant notices and started up the operation of its own emergency stand-by organisation in order to ensure the safety level of the plant. STUK's organisation was partly summoned at STUK's emergency centre to follow the situation and communicate with Loviisa NPP as well as key authorities and partners of co-operation. The see water level increase of 1,73 m higher than the average caused no leaks into the plant's rooms or other corresponding phenomena that would endanger the plant's safety; both reactor units were in normal operation. The event was later classified as INES Level 0."
Q: Have any feedback from the situation and from its management been made to the emergency preparedness arrangements of the STUK and/or of the NPP?

Answer: The sea water level has been included to the information coming from the NPP to STUK.

NPP has made some corrections to the emergency instructions and emergency preparedness guides concerning the water levels and required actions, including informing STUK.

STUK has organised a weather risk seminar 2005 with Marine Research and Meteorological Institute. Weather risk has been also included to Finnish Nuclear Research Programme (SAFIR).

The emergency arrangements of NPP and STUK were evaluated. The action was basically good and satisfactory in this emergency stand-by situation. Both NPP and authorities followed up their emergency instructions.

Minor updates were done afterwards in the operating procedures for disturbance and accident situations of high sea water level and contacts to the authority, whose responsibility is to estimate the changes in sea water level.

Q.No	Country	Article	Ref. in National Report
102	Hungary	Article 16.1	2.12, p.49

Question/ Comment: "The on-site and off-site plans include provisions to inform the population in the case of an accident. In addition, written instructions on radiation emergencies, emergency planning and response arrangements have been provided to the population living within the 20 km Emergency Planning Zone. Basic information on radiological emergencies and response is given in the telephone directories of Finland. The published regional directories (about the EPZ area) contain similar but more detailed instructions. "
Q: In case of a radiological or nuclear emergency the population in the Emergency Planning Zone around an NPP have to perform several protective activities. What is the role of the NPPs in Finland in the preliminary preparation of the population for their emergency tasks?

Answer: The instructions to the population are prepared jointly by the NPP and the authorities.
In Finland population is not specially trained for the protective actions, exercises are mainly held at management level of the responsible local authorities.

In the early stages of an accident situation, the emergency organisation of the nuclear power plant is responsible for issuing recommendations on protective measures for the population to the authority commanding the rescue operations. This responsibility is continued until STUK has adequate information on the situation and it announces to take the responsibility for issuing these recommendations. The commander of rescue operations decides on all protective measures taken, based on received recommendations.

Q.No	Country	Article	Ref. in National Report
103	India	Article 16.1	Page-49

Question/ Comment: In Finland, the requirement for EPZ as given in the report is 20 Km.
What is the Finnish position on the requirement of exclusion zone that is under the direct control of plant authorities, for older and new NPPs.

Answer: Here is the description of different areas in the vicinity of NPP (see YVL Guide 1.10):

A nuclear power plant site extends to at least about one kilometre's distance from the facility. It is defined as an area where only power plant related activities are allowed as a rule. Permanent settlement is prohibited and only very limited employee accommodation. The licensee responsible for the operation of the nuclear power plant has authority of decision over all activities in the area and is able to remove unauthorised individuals from the site, if necessary, or prevent such individuals from entering it. Visits onsite are allowed provided that the licensee has the possibility to control the movement of visitors.

The plant site is surrounded by the precautionary action zone extending to about a five kilometres' distance from the facility. Land use restrictions are in force within the zone. Dense settlement and e.g. hospitals or facilities inhabited or visited by a considerable number of people are not allowed within the zone. The zone may not contain such significant productive activities as could be affected by an accident at the nuclear power plant. The number of permanent inhabitants within the zone of the present NPPs should not be in excess of 200. The number of persons taking part in recreational activities may be higher, provided that an appropriate rescue plan can be drawn up for the area.

In accordance with a Ministry of the Interior Order [3], the nuclear facility is to be surrounded by the urgent protective planning zone extending to about 20 kilometres from the facility; the zone shall be covered by detailed rescue plans for public protection drawn up by the authorities. The authorities also bear responsibility for the implementation of the plans. In implementation, special attention shall be paid to the characteristics of the site's surroundings, such as archipelagos that are difficult to cross and recreational settlements, for example.

Q.No	Country	Article	Ref. in National Report
*	Pakistan	Article 16.1	Section 2.12, Page 48 & 49

Question/ Comment: STUK has an expert to advise local & governmental authorities. Please provide the criteria for the expert’s qualification and mode of his interface with the local & governmental authorities? With reference to the event on 9, January 2005, does any on-site/off-site Emergency Plan exist for external events, like flooding. What are criteria for selection of 20 Km as EPZ (sheltering and evacuation) and how the availability of un-expired iodine tablets within 24 hours is ensured? What kind of training is imparted to the people responsible during off-site emergency plan for their radiological protections?

Answer: 1) The experts in STUK’s emergency organisation are those who are responsible for same type of tasks in their everyday work. Their basic education is Master of Science in Technology or equivalent academic degree. In addition they participate general and special training for emergency situation in STUK and take part in emergency exercises. Experts, who advise local and governmental authorities, have good knowledge of the different emergency situations and radiation protection and they are trained to give the situation reviews understandably without complicated technical details.

2) Yes. On-site emergency plan and instructions were used in the event on 9, January 2005 at NPP. The situation was classified as an emergency-stand by which involves alerting the nuclear power plant emergency organisation to the extent necessary to ensure the safety level of the plant. The emergency standby state and its justification were promptly communicated to STUK and to the local rescue authority. STUK’s organisation was partly summoned according STUK’s emergency instructions at STUK’s emergency centre to follow the situation and communicate with Loviisa NPP as well as other authorities.

3) Immediate measures in emergency planning zones (0 - approx 20 km) within the off-site area are as follows. Decisions on measures needed in situation are based on plant conditions.

Zone 0 - 5 km, precautionary action zone (5 km)
- immediate evacuation after declaration of general emergency in plant
Zone 5 - 20 km, urgent protective planning zone
- sheltering indoors
- iodine prophylaxis
- evacuation
All options considered simultaneously; choice of countermeasure depends on e.g. weather conditions, too.

Iodine tablets shall be distributed in advance for the population to permanent and free-time accommodations as well as work places at least within a five kilometre radius from the nuclear power plant. The distribution shall be repeated regularly in accordance with the expiration of the iodine tablets. In the further surroundings the iodine distribution is planned to be organised by authorities from storages.

4) During the operation of a nuclear power plant, joint exercises between the authorities and the nuclear power plant are organised with the lead of the State Provincial Office at least once every three years according to Section 7 of the Decree (774/2001) of the Ministry of the Interior. Also other training has been organized for local rescue authorities such as the drills concerning the measurements patrols and the transporting injured worker to hospital and lectures and table top exercises about the roles and responsibilities of NPP and authorities in the NPP emergencies.

Q.No	Country	Article	Ref. in National Report
104	Slovenia	Article 16.1	p.49

Question/ Comment: For the new unit under construction at Olkiluoto site, the utility has provided STUK with a prelimi¬nary emergency plan.
Are there any interfaces between the preliminary emergency plan of the new unit with the existing emergency plans of the existing units? If yes, can you briefly describe the interfaces?

Answer: Olkiluoto 3 unit has site emergency procedure for accidents and also evacuation procedures including alarm signals, instructions, meeting and muster points for emergencies in Olkiluoto 1 and 2.

The instructions for the construction workers evacuation of Olkiluoto 3 site have been also included Olkiluoto 1 and 2 emergency plan and instructions.

Q.No	Country	Article	Ref. in National Report
105	United Kingdom	Article 16.1	Page 49

Question/ Comment: The report refers to off-site emergency plans being prepared by the local authorities. What powers do the local authorities have to ensure the co-operation of all the interested parties, including utilities, emergency services, government departments and adjacent local authorities in drawing up these plans? Which organisation takes control in the event of an emergency?

Answer: The responsibilities of authorities are regulated in Rescue Act and the roles are described more detailed in off-site emergency plans.

The rescue administration management system is based on a regional responsibility allocation that covers the whole country. The Ministry of the Interior in co-operation with other government authorities is responsible for measures needed at a national level. State Provincial Offices have the corresponding coordination responsibility for measures on the provincial level in co-operation with other local administrative authorities. Local chief rescue officers manage action taken in their own responsibility areas.

Q.No	Country	Article	Ref. in National Report
106	France	Article 17.1	p. 52 – 2.13.2 and 2.13.3

Question/ Comment: Could Finland indicate the periodicity of site safety reassessment regarding natural phenomena and human activities?

Answer: Reassessment is done basically continually, based on new findings or events internationally or nationally. The PRA is meant to be up to date continuously.

Q.No	Country	Article	Ref. in National Report
107	Korea, Republic of	Article 17.1	

Question/ Comment: (Article 17-1)
Do you have any case of re-assessment of existing NPPs in operation when you newly identified natural phenomenon which can be significant to safety? In addition, do you have any procedure of re-assessment in

this case?

Answer We have not identified new natural phenomena, but we have identified new ways, in which already known phenomena can cause safety-significant hazards. All such findings have resulted in re-assesment and design modifications. Some latest examples:
1. Blocking of all diesel air intakes due to heavy snow storm and strong wind. This occurred during testing of one diesel generator in Olkiluoto. Resulted in changes of air intake system.
2. Freezing of reactor level measurement reference piping due to loss of heating (HVAC) of instrumentation rooms in very cold weather. When found out in Olkiluoto, the total core damage frequency increased considerably. Detailed analyses and design modifications (room temperature alarms) have practically eliminated the risk.
3. Oil spill due to tanker accident, drifting to Loviisa site, especially during refueling outage when the vessel is open. In this case both primary and secondary feed&bleed functions are unavailable, and residual heat removal takes place only by service water system. Heavy oil can block cooling water or service water intake. Contribution to Loviisa low power and shutdown risk is approximately 13% of total core damage frequency.
In the context of external hazards PRAs, several plant modifications have been done, since the analyses revealed features that had not been taken into account in plant basic designs. These include earthquakes, seawater phenomena (mussels, seaweed, frazil ice), strong wind, and lightnings.

Q.No	Country	Article	Ref. in National Report
108	United States of America	Article 17.1	

Question/ Comment The report talks about a possible Olkiluoto Unit 4 and states that the STUK will give its comments on the siting of this unit and its environmental impact by September 2007. Has this statement been made?

Answer Yes. That was the statement on the programme of EIA (Enviromental Impact Assesment) for possible OL 4 NPP unit. It defined the compiling principles of EI report to be informative in describing all expected environmental impacts of the construction and operation of a new NPP unit.
STUK raised e.g. questions about the cooling water spreading in the see area, as well as about the construction of the cooling water channels.
The EIA is not yet a regulatory process where a new site permit is given, see the detailed licensing description in 2.3.3, p. 15 in the national report.

Q.No	Country	Article	Ref. in National Report
109	United States of America	Article 17.1	2.13.2

Question/ Comment The report indicates that one way the Loviisa Plant is protected against a loss of off-site electrical power is through a direct connection to the Ahvenkoski hydro power station. If a regional blackout were to occur, would the hydro station trip off line, and if so, what actions would have to be taken to restart the hydro unit to make power available to the Loviisa Nuclear Station.

Answer If Ahvenkoski hydro power plant is tripped due to the regional black-out, it can be started again manually to the island operation mode to supply Loviisa power plant via direct connection line. The direct connection to the Loviisa NPP is not a part of a normal external distribution network, so it not assumed to break down during external network collapse.

Q.No	Country	Article	Ref. in National Report
110	India	Article 17.3	Page-50, Topic- Regulatory approach to s

Question/ Comment he report contains extensive description of safety assessment of NPPs against internal and external hazards. Whether the turbine missile impact at multiunit sites has also been taken into account and if so, please indicate the methodology used.

Answer The turbine missile has been taken into account as is required in our YVL-guides. We estimate, based on calculations, the weight and possible directions and speeds of the missiles and calculate their consequences. We also review the countermeasures which are implemented into the design to prevent the missiles to go through the structures.

Q.No	Country	Article	Ref. in National Report
111	India	Article 18.1	Page-54, Topic- Defense in depth, sectio

Question/ Comment With regards to the implementation of provision of Containment venting system for Olkiluoto 3, please elaborate on the postulated accident scenario that led to the requirement of containment venting.

Answer The Finnish YVL Guide 1.0 states that the containment must be equipped with a filtered venting system which can be used to remove any overpressure caused by non-condensable gases possibly released in a later phase of an accident. The objective is to reduce fission product leak by decreasing the pressure difference between containment and environment. The YVL Guide 1.0 also states that release into the environment of a steam-gas mixture accumulated in the containment shall not be designed as the primary measure of preventing containment pressurisation.

The planned use in severe accidents is hence scenario independent: if non-condensable gases are produced in the accident, they can be later vented.

Q.No	Country	Article	Ref. in National Report
112	Japan	Article 18.1	p.98 Annex3

Question/ Comment: Annex3 Defense–in-Depth, Ensuring primary circuit integrity says;
"-- The requirement for the construction plan of the primary circuit components are given in Guides YVL 3.1, YVL 3.3, YVL 5.3, YVL 5.4.—".
In Finland, there are 3 types of reactors, VVER, AA-type BWR and ERP. The regulatory requirements should be different according to the reactor type. However, the titles of XVL guides do not tell the difference of the rector type. How do XYL guidelines distinguish the differences of the reactor type? What considerations are paid, in order to have the same level of safety among the different type s of reactors?

Answer: The regulatory guides (YVL Guides) have been prepared in such a way that requirements are valid to all types of light water reactors. Of course, for instance, requirements for steam generators are not valid for boiling water reactors.

Q.No	Country	Article	Ref. in National Report
113	Japan	Article 18.1	Annex3,p98 right column

Question/ Comment: Annex 3, "Defense–in-Depth, Ensuring primary circuit integrity" says;
"--According to these guides, the components in Safety Class 1 shall be dimensioned as required by the standards ASME Boiler and Pressure Vessel Code, Section III".
It is described in the report that the XVL guides require the primary components to be dimensioned as required by ASME SEC.III. But the original code and standards in which the 3 types of reactors have been design are different. Loviisas are in accordance with Russian codes, TVOs are in ASME, and EPR may be in RCCM. Although those codes are fundamentally not different, the details should be different. How are the different points dealt with in having the same level of safety in the different types of reactors?

Answer: According to YVL 3.5 section 2.2.3: "As a general rule, ASME Boiler and Pressure Vessel Code Section III, Division 1 (ASME III) [5a] shall be applied. The mandatory rules regarding strength analyses, stated in its subsections NB, NE, NF and NG, apply in these cases unless detailed requirements have been presented by STUK. Alternatively, another design and strength analysis standard for pressure equipment, approved by a foreign regulatory authority and corresponding in principle, may be submitted to STUK for approval. One of the conditions for approval is that the standard in question has been applied previously when building nuclear power plants of the same type."

OL1/2 class 1 pressure equipments are designed according to ASME III. Lo1/2 main pressure equipments are designed and manufactured according to soviet norm at the time. OL3 main pressure equipment are designed and manufactured according to RCC-M. The applied code must be followed as a whole. We think that the safety level in different codes is about the same. It is better that the designer and the manufacturer use the code, which they have applied earlier. STUK approves the construction plans of pressure equipment and can present additional requirements in the approval letter if appropriate.

Q.No	Country	Article	Ref. in National Report
114	United States of America	Article 18.1	

Question/ Comment: The automation system renewal at Lovissa is in process and is scheduled to take 10 years to complete. Old systems remain in use until replaced by the new system. Why will this change take 10 years to implement? How are operators and other workers being trained on these new systems?

Answer: The renewal is divided in four phases; each phase covers specified automation systems and is implemented during normal annual (app. 30 to 40 days) service outage, one phase in one unit per year (there is two units at the site). Normally, this kind of modification is done during quite long outage of several moths when the total time can be much shorter.

Well before renewal phases the training simulator is updated to validate the final user interface and to educate the operators. Shifts are well obligated to the modification also form a developing point of view (especially how the user interface can be better and what kind of information they really need in a control posts). Other workers (and operators also) are informed during specific training days and by education reports that represent the modifications.

Q.No	Country	Article	Ref. in National Report
115	Germany	Article 18.2	page 55, 2.14.3

Question/ In the context of the automation modernisation project it is stated that digital instrumentation and control

Comment technology has already been implemented in modernised systems.
Is digital instrumentation also used in the reactor protection system and if so, how is the reliability of the instrumentation assessed?

Answer No, only turbine side systems and some specific reactor side functions (like automation of main circulation pumps of OL1/2) is modernised by using digital I&C. First protection system renewal will be the phase two of Loviisa automation renewal project 2010.

YVL guide 5.5 "Instrumentation systems and components at nuclear facilities" requires that I&C systems shall be subjected to a quantitative reliability analysis, but licensee can select a method to perform the analysis.

Q.No	Country	Article	Ref. in National Report
116	Pakistan	Article 18.2	Article 18 ,Section 2.14.1, Page 54

Question/ Comment It is stated that “Severe accidents were not taken into account in the original design of the Loviisa and Olkiluoto plants. However, since their commissioning, many improvements have been implemented in the plant structures and systems, as well as procedures to enhance safety and to mitigate the consequences of severe accidents”. Since severe accidents are considered in Loviisa and Olkiluoto plants in some areas then how STUK ensures the safety in all aspects of the nuclear power plant in case of severe accidents?

Answer STUK required provisions for severe accidents in the existing plants in 1986. The utilities had to prepare plant specific severe accident management strategies and make plant modifications needed to implement the strategy.

In the Loviisa VVERs the main modifications were:
o installation of high capacity primary system depressurization valves
o modifications to ensure external cooling of the pressure vessel for in-vessel melt retention
o installation of recombiners and possibility of forced opening of ice condenser doors for hydrogen management
o installation of containment external spray for pressure control
o installation of new instrumentation for severe accidents and a separate severe accident control room.
Modifications in the Olkiluoto 1 and 2 BWRs were
o provision for flooding of the lower drywell prior to pressure vessel failure
o shielding of penetrations in the lower drywell
o installation of possibility to fill the containment with water from an external source
o installation of a containment filtered venting system
o a system for containment pH control during the accident.
After installation, Loviisa and Olkiluoto severe accident strategies have been reviewed by STUK when the operating licenses have been renewed, and in periodic safety reviews. The validity of the strategies is also ensured by the Level 2 PSAs, which are updated according to plant changes, and reviewed by STUK.

Q.No	Country	Article	Ref. in National Report
117	Slovenia	Article 19.1	P. 58

Question/ Comment Appropriate procedures shall exist for the operation, maintenance, in service inspection and periodic tests … Does STUK allow utilities to practice the On-line-maintenance (OLM) for safety related equipments and what are the specific conditions, limitations and criteria set up for this activities besides TS limitation ?

Answer In our requirements we require not only single failure tolerance of the safety systems but additional we require that another train is under maintenance or repair (N-2 criterion). This means that it is possible to carry out on-line maintenance during normal operation without violating the single failure criterion. In TechSpecs has been given the rules how these on-line maintenance shall be carried out. These rules based on PRA.

Q.No	Country	Article	Ref. in National Report
118	United Kingdom	Article 19.1	Page 56

Question/ Comment The report states that the purpose of the commissioning programme is to give evidence that the plant has been constructed and will function according to the design requirements. To what extent, also, does commissioning confirm and verify operating instructions, maintenance requirements, limits and conditions of operation, technical specifications etc.?

Answer Test and operating instructions will be validated during commissioning. This includes system test and operating instructions and plant operating instructions. Emergency operating procedures will be verified by the full scope replica training simulator.

There will be no actual validation process for Technical Specification during commissioning because the unit has to be operated according to approved TechSpecs. During commissioning the preventive maintenance

programme and management of immediate repairs shall be in place. Thus, just limited maintenance activities allow validating the relevant maintenance instructions.

Q.No	Country	Article	Ref. in National Report
119	United States of America	Article 19.1	

Question/ Comment: In section 2.8.3 Monitoring and control of Olkiluoto nuclear power plant the report discussed a 30-minute rule that has been the design basis for the protection system at Olkiluoto 1 & 2. Important protection measures and safety systems start up automatically, so that no actions of operating personnel are needed during the first thirty minutes after the beginning of the operational transient or postulated accident. Are there situations where operators are allowed to manually actuate safety systems before this 30-minute period?

Answer: In our guides has been stated that "a nuclear power plant shall contain automatic systems that maintain the plant in a controlled state during transients and accidents long enough to provide the operators a sufficient time to consider and implement the correct actions". In OL 1 and 2 this sufficient time means 30 min. Operators follow instructions which have been given in the emergency procedures during accidents. Manual operation before this 30 min rule is possible if it is allowed in the emergency procedures.

Q.No	Country	Article	Ref. in National Report
120	Bulgaria	Article 19.3	

Question/ Comment: What criteria are used to determine the lifetime of the plant.

Answer: In Finland the nuclear power plants do not have a pre-determined fixed lifetime. In practice the end of a plants' lifetime is reached when some equipment have deteriorated beyond their acceptable operation criteria, and it is not technically possible or economically feasible to repair or replace them.
For the most lifetime limiting components, the current and foreseeable ageing mechanisms of their main parts are identified to conclude that the existing ageing management and maintenance procedures are adequate.

Please, see also the answer to question 10.

Q.No	Country	Article	Ref. in National Report
121	Bulgaria	Article 19.3	

Question/ Comment: Do you have long term operation strategy or plans to operate the NPPs beyond design lifetime.

Answer: The Finnish operating licenses are generally granted for limited periods and will not be based on a pre-determined fixed lifetime. Periodic Safety Reviews according to IAEA safety guide NS-G-2.10 are carried out in approximately ten year intervals regardless of the license period. The prerequisites of the lifetime extension in Loviisa were formally demonstrated by updating the main components' fatigue usage factors to encompass the 20 more years of operation. In Loviisa NPP, considerable upgrading of the plant concept and obviously unreliable components was already done during commissioning and early years of operation, and a systematic lifetime programme was launched ca. 15 years ago to identify further needs of replacement and introducing new technology. Continuous improvement activities have also been carried out in Olkiluoto plants.

Please, see also the answer to question 10.

Q.No	Country	Article	Ref. in National Report
122	Bulgaria	Article 19.3	

Question/ Comment: Do you have a re-qualification program for components to be used beyond their design lifetime.

Answer: Systematic lifetime programmes have been launched in Finnish NPPs to identify needs of component replacement and introducing new technology. Maintenance programmes including periodic testing and inspections are aimed to verify that components remain the required qualification level. The true lifetime of the components depends on the design, but also on the operating organisation, which can considerably affect the lifetime by minimizing thermomechanical loads and attacks by chemical impurities in transient situations.

Q.No	Country	Article	Ref. in National Report
123	Canada	Article 19.6	Section 2.15.6, p.63

Question/ Comment: Trending of the numerous non-reportable events that may occur at a typical plant each year could suggest an underlying safety-significant issue. Does STUK audit licensees for programs that a) collect information on these non-reportable events and b) analyze them for trending?

Answer: STUK requires the licensee to have system to collect information on minor events and near-misses in order to develop the management system. STUK is inspecting (periodic inspection programme) the licensee

management systems and one topic is reporting and corrective action programme. Also the inspection targeted to the operations is reviewing the operational reports every six months.

Trending analysis of all events during a year is part of the annual report of the licensee.

Q.No	Country	Article	Ref. in National Report
124	Canada	Article 19.6	Section 2.15.6, p.64, para. 1 and 2

Question/ Comment: Under “INES-classified events”, it is mentioned that in response to the four Level 1 events which occurred in 2005 and 2006 at the Loviisa and Olkiluoto NPPs, new procedures were implemented, programs were improved and documents were updated. How much did human errors contribute to these events? What actions specific to human factors were implemented by the licensees to minimize recurrence?

Answer: Human and organisational factors caused these particular events.

Loviisa event: Instructions concerning the decontamination and storage were improved. A project to build more storage room was started.

TVO events:
In the first reported event the fault was originally made several years ago. Corrective actions were related to maintenance and testing instructions of the safety related relays.

The second event was due to lack of manpower, tight timetable and long working hours. There were also difficulties in managing the modernisation project. In the next years outage the other unit was modernised without any difficulties. TVO did improvements to working schedules, working orders, instructions and increased the number of the personnel.

The third event was related to modification made 1998. There was no need for testing after this modification but for some reason OLC was not modified and there was still requirement to test the system. Corrective actions were related to modification process, review and inspection process of instructions, OLC familiarization in training programme and safety culture self assessment programme (IAEA).

Q.No	Country	Article	Ref. in National Report
125	Germany	Article 19.7	page 65, 2.15.7

Question/ Comment: Concerning the operating experience feedback it is mentioned, that further attention is still needed to avoid recurrence of incidents.
Please provide more information about activities planned to avoid recurrence of incidents.
Is a more detailed technical analysis of the events or more manpower necessary?

Answer: The activities related to avoid recurrence are mainly focused on better and more thorough event assessment techniques including assessment of causal factors like organisational issues and management. This is related to human resources and competencies especially in HOF area.

Q.No	Country	Article	Ref. in National Report
126	Germany	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: STUK has not set forth specific criteria for internal and external experiences to be considered. In practice the licensees are using WANO reports and IRS reports as basic material to be screened in external OEF.

Lisensees have their OEF committees for screening, analysing and following the corrective actions. The licensees have also their internal audit programme and OEF is one topic in these programmes.

In STUK's periodic inspection programme there are two inspections related to OEF, namely C1 Operations and B4 International OEF.

In the inspection Operations one topic is reporting and corrective action programme. In this inspection the implementation of the corrective actions decided based on events are verified every six months.

STUK requires the licensee to have a system to collect information on minor events and near-misses in order to develop the management system. STUK is inspecting (periodic inspection programme) the licensee management systems and one topic is reporting and corrective action programme. Also inspection targeted to the operations in reviewing the operational reports every six months.

Trending analysis of all events during year is part of the annual report of the licensee.

Q.No	Country	Article	Ref. in National Report
127	Switzerland	Article 19.7	pages 65 - 66, 2.15.7

Question/ Comment	Does a methodical comparative evaluation of stored event date (of one or more licencees) exist to detect systematic causes particularly in the field of human and organisational factors?
Answer	This is an area of development. We do not have particular requirements in this area. In the case of events licensees are requested to review any similar events or root causes. The licensees are also requested to make annual summary report where events in particular year are assessed. STUK has organised a national training course on OEF 2007 which will have continuation 2008. The objective is to develop competencies in the field of event investigations, deepen the understanding of organisational issues and affecting factors instead of root causes. STUK is also revising the OEF regulations 2008-2009.