Nuclear Safety Convention - 2nd Review Meeting
(Vienna, 15 - 26 April 2002)

Answers (from HSK and RD-BFE) to

Questions on the Swiss National Report (in Countries Group 4)
from the following countries:
Austria, Brazil, Croatia, Germany, Japan, Italy, Peru, Romania, Ukraine, United Kingdom, United States

1st column:
Country from which questions are originated

Question number in the country of origin

A	Austria
Braz	Brazil
Croat	Croatia
D	Germany
Jap	Japan
Italy	Italy
Peru	Peru
Rom	Romania
Ukrai	Ukraine
UK	United Kingdom
US	United States

2nd column: Article No. in NSC (also Chapter No. in the Swiss Report) referred to /relevant to the question as indicated by the question's author

3rd column: Chapter concerned in the Swiss report identified on the basis of question's content and meaning; [...] indicates additional reference parts where the subject is addressed and elements of answer could possibly be found

4th column: Page number containing the text referred to ; [...] indicates additional reference pages where the subject is addressed and elements of answer could possibly be found

5th column: Comment or question as formulated by the author of comment /question [some obvious corrections have been made to the original; other inconsistencies are noted (??? Sic) and, if available, correct interpretation is given]

6th column: Running number intern to HSK

7th column: HSK Answer

Article in NSC	CHNR chap + para	CHNR page	COMMENT/QUESTION	Nr. HSK	ANSWER
General Comment General Comment			The report is simple, informative, self-sustained and presents all relevant data. General Comment. The report shows that the safety measures related to the Convention of Nuclear Safety are being suitably fulfilled.	1	Switzerland appreciated the general positive comments made concerning the Swiss report
Art. 6 Art. 6	Art. 6 Art. 6	14 14	What have been the most significant safety issues that Switzerland has had to deal with since the first meeting of the CNS? What has been the outcome or resolution of these issues?	2	The most significant safety issues in the last 3 years have been: • Degradation of the safety culture in one NPP due to excessive budget reduction (liberalisation of the electricity market). The most important events caused by this degradation have been falsifications of checklists used for routine checks before the start-up of the plant at the end of the yearly outage (classified INES 1); three small fires in the radiation protection zone, also during the outage; loss of expertise because in the year 2001 7 licensed persons (shift personal) left the plant. The NPP has dismissed two persons involved with the falsification of checklists. The conditions for the employees (weekend compensations etc.) have been restored i.e. the costs have been taken back. The nuclear safety authority (HSK) has enforced the NPP to take measures to avoid similar events in the future. The nuclear safety authority has augmented inspections for this NPP. • A weakness of the seismic qualification of brick-walls in the electrical building of a NPP. This weakness was detected during a seismic walkdown (inspection), performed within a periodic safety review. This weakness caused a significant increase in the core damage frequency. The walls have been reinforced.
Art. 6 Art. 14	Art. 6 Art. 14 Clause (ii)	14 45	To what extent are safety performance indicators used by both the NPP's and regulatory body in reviewing the operational safety of plant and activities in NPP's ? To what extent do you use performance indicators to assess the safety performance of a licensed reactor? What indicators are used?	3	The NPP's uses the WANO safety indicators. The safety authority (HSK) has in 2001 developed a set of safety indicators to be able to make a judgement of a possible change in the safety status of the NPP. These safety indicators will be used from mid 2002 on. The safety indicators of the HSK belong to the 4 areas "operation", "maintenance", "radiation protection" and "safety culture". Each of these areas are divided in several fields. The catalogue of safety indicators has about 100 indicators.

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Art. 6	Art. 6	15	The report mentions completion of the second generation NPP (Leibstadt and Gosgen) PSRs; what safety improvements were identified as a result of these reviews and have they all been implemented to an agreed time scale?	4	The periodic safety review of the nuclear power plant Leibstadt (KKL) was performed together with the safety analysis concerning the application of the licensee to upgrade the power of the plant. The following safety improvements have been ordered by HSK: • A broader programme for the surveillance and inspections of fuel elements; KKL has experienced in the past many failures of fuel elements, including failures with washout of fuel. • A systematic programme to assess the ageing of systems and components. • The completion of the existing Probabilistic Safety Analysis (PSA) with a living PSA. All of these requirements have been implemented. The results for the Goesgen PSR are given in the Answer HSK 22
Art. 7	Art. 7 Clause 2 (ii)	19, 20	Noting that the regulatory body do not grant the NPP licenses, how is it ensured that the safety requirements of the HSK are not modified in the licence granting process?	5	In the report is stated, that the nuclear safety authority (HSK) elaborates a safety evaluation report (SER) if a licensee asks for a new licence or a change of the existing license . In this SER HSK includes proposals for licence conditions. The application for a license and the SER are published before the licensing authority grants the license. That means that the license conditions proposed by HSK are known early in the licensing process to all interested parties. Up to now the licensing authority, the Federal Council, has taken over all licensing conditions HSK has proposed.
Art. 7	Art. 7 Clause 1	17	Besides combining the existing Act and a related Federal Order, why is it felt necessary to have a new Nuclear Energy Law?	6	The Atomic Energy Act dates from 1959. At that time very little was stated on specific safety measures, on waste management and on decommissioning. In 1994 the Radiological Protection Act and the Radiological Protection Ordinance have been put in force. By doing so a very general article in the Atomic Energy Act dealing with radiation protection has been replaced, giving more detailed prescription in the field of radiation protection. The new Nuclear Energy Act should provide more detailed prescription in the nuclear safety and the waste management field. Moreover, the draft of the new Act foresees that reprocessing should no more been allowed, whereas at the moment there does not exist any regulations concerning reprocessing.
Art. 7	Art. 7 Clause 2 (ii)	23	If it is judged necessary by HSK in the interests of safety, how is an amendment, addition or revocation to	7	HSK has to write a document, a safety analysis report, in which reasons are stated for the necessity for an amendment, an addition or a revocation of license conditions. This report is sent through the legal division of the Office of

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			licence conditions made ?		Energy to the licensing authority with the recommendation to change the license.
Art. 7	Art. 7 Clause 2 (ii)	23	What legal status do HSK Permits have?	8	Answer to question HSK 8 and 9: There exists, on a legal basis, two kinds of HSK-permits: • Permits, which are explicitly stated in the license • Permits, which are generally mentioned in a HSK-guideline HSK applies technically and administratively the same procedure for the two kinds of permits. But the legal consequences in case of a breach of a permit are different.. Article 35 of the Atomic Energy Act applies if a breach of permit in a license occurs. That means such a breach will be punished with arrest or fine up to 100'000 Swiss Francs. If another permit is violated, HSK will try to solve the problem by discussions with the licensee. If this does not bring a solution, HSK will issue a decree in which Article 35 is mentioned. Only when this decree is violated will a punishment will take place. Of course, if by violation of any of the mentioned permits the nuclear safety is endangered, HSK can take all necessary steps, i.e. order the shutdown of the reactor, to protect human beings and the environment.
Art. 7	Art. 7 Clause 2 (ii)	23	How is the breach of a Permit considered in relation to a breach of a licence condition and do the same penalties apply?	9	See answer to HSK-8
Art. 7	Art. 7 Clause 2 (iv)	24	Are the enforcement powers of HSK inspectors legally based?	10	Yes. Article 8 of the Atomic Act says, that the organisation named by the Federal Council can order at any time all measures which are necessary to ensure the safety of human beings and the environment and can keep under surveillance that all conditions of the Atomic Act, of ordinances, of the licence and of decrees are followed. The Federal Council has named HSK, in the Ordinance on the Supervision of Nuclear Facilities as the competent organisation.
Art. 7	Art. 7 Clause 2 (iv)	24	Do they include the powers to carry out prosecutions in the Law Courts?	11	No. If a violation of the Atomic Act, an ordinance, a condition in a licence or a decree is detected by HSK, then HSK will report the event through the legal division of the Office of Energy to the attorney of the government.
Art. 7	Art. 7 Clause 2 (iv)	24	Could you provide more detail as to the enforcement options open to the	12	Here are mentioned some enforcement actions HSK has taken during the last years:

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			regulator and how they are applied in practice?		• Release of a decree with fixed time schedule for the implementation of technical measures (Nuclear Power Plant Goesgen). Against the decree the licensee made a complaint (see answer to HSK-22) • The licensee needs a permit from the HSK to restart the reactor after the yearly outage. Several times a licensee has applied for this permit and HSK has not given it at the time the licensee has asked for. HSK has found that some conditions to restart the reactor were not fulfilled at that time. This decision of the HSK caused delay to restart the reactor of one to several days. • In a research institute the conditions for the storage of some radioactive waste packages in the intermediate storage facility have not been met. HSK has enforced the institute to recalculate the accident scenarios for these waste packages and to submit a revised safety analysis report, before these packages can be stored.
Art. 7	Art. 7 Clause 2 (iv)	24	How does the regulatory Decree (mentioned under Article 10) fit into the legal enforcement framework, what is its legal status and how often is it used?	13	Usually enforcement actions take place through writing letters in which HSK asks the licensee to take specific measures in a given time. In almost all the situations so far, the licensee has agreed to implement the measures.– sometimes after clarification of the measures asked by the HSK and after discussions of the time scale the measures have to be implemented. In some cases the licensee has decided to complain against the measures. In this case the licensee has to ask HSK to impose the measures with a formal decree. Against this decree he can take legal steps, i.e. make a complaint.
Art. 8	Art. 8 Clause 2	29	What concerns or events initiated the several parliamentary interventions demanding a more independent position for the HSK?	14	The independence of the regulatory body is a fundamental safety principle. It is therefore requested by the Convention on Nuclear Safety and the IAEA Safety Standards. The Three Mile Island accident initiated the political discussion of the independence of the HSK and the following assessment by the Management Commission of the National Council. The later parliamentary interventions where mainly initiated by the requirements of the Convention on Nuclear Safety.
Art. 8	Art. 8 Clause 2	29	Why do Switzerland consider necessary to create <u>now</u> a “legally independent National Agency for Technical Safety? What is the status of the proposed legislation?		Beside the formation of a legally independent National Agency for Technical Safety the governmental project aims at implementing a consistent safety philosophy in all fields of technical safety and at adapting the Swiss legislation to the standards of the European Union. The project was initiated by the parliamentary interventions mentioned above and the political objectives of the Federal Department of Environment, Transport, Energy and Communications

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Art. 8	Art. 8 Clause 2	28	When will the legal basis for full independence of the Swiss Federal Nuclear Safety Inspectorate (HSK/DSN) be established? What is the current situation of the formation of the legally independent National Agency for Technical Safety?		Within the frame of the mentioned project a draft of a new Federal Law on the Supervision of Technical Safety has been established and submitted to a formal consultation at concerned organisations and political parties. The new Law will presumably be debated by the Parliament in the Years 2004 and 2005. The legal basis for full independence of the HSK will therefore be established at the earliest in 2006.
Art. 8	Art. 8 clause 1	28	About the Nuclear Safety Committee: Who are the current members of the Committee? How are they selected? Is the appointment for a fixed term? Are there representatives from the nuclear power utilities? What is the frequency of meetings when there are no new licensing decisions?	15	The current members of the Nuclear Safety Committee are: Mrs. I. Aegeter, Mr. K.H. Alex, B. Covelli, Th. Flüeler, W. Gilléron, E. Glauser, W. Jeschki, Mrs. S. Virtanen, Mr. W. Wildi (President), H. Wilhelm, W. Zeller, H.U. Zwicky In the ordinance of the committee is stated: • The committee comprises 13 members, at the most • The members have knowledge of the scientific and technical areas the committee takes care • The members are elected by the Federal Council on proposition of the Departement and the Committee. • The election is ad personam, that means the members do not have instruction of the organisations they come from The election period is four years. A person can be member of the committee for three election periods, that means for 12 years at the most. The current members are university professors, technical advisers of engineering offices, private experts, employee of electricity utilities. The committee has to meet at least six times a year, as stated in the ordinance. The committee has created three subcommittees (engineering, radiation protection, human factors and organisation), which meet approximately ten times a year.
Art. 8	Art. 8 Clause 2	28	Communication with the public is now widely recognised as an important indicator of “de facto” regulatory independence. Does the regulatory	16	Answer to HSK 16 and 17: Yes. HSK has the authority to communicate independently with the media and the public. HSK runs a home page on the internet (www.hsk.psi.ch). All the publications and press releases can be found on the internet.

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			body have the authority to communicate independently its requirements, decisions and opinions to the public?		Every year a report on the safety of the Swiss Nuclear Power Plants is published. Press releases are made in context with the permit to restart a nuclear power plant after outage and after events which are of public interest. Such events are mentioned in the HSK-guideline R-15. HSK answers in addition to questions of news papers, gives interviews and statements for news papers and TV-media. To be able to release competent, correct and fast communication statements HSK has an information group in its organisation.
Art. 8	Art. 8 Clause 2	28	If it does, what form and frequency does this communication take?	17	See answer to HSK 16
Art. 9	Art. 9	30	How is the insurance fund for nuclear damage being formed?	18	The liability of the license holder is regulated in the Liability Act and the Liability Ordinance. The regulations have been explained in answers to questions on the first Swiss Report on the CNS (HSK-answer 13). A part of possible costs for damage due to the operation of a nuclear power plant is insured by the government. The licensee has to make yearly contributions to the government. These contributions are put in the “Nuclear damage fund”, which is administered by the Office of Energy.
Art. 10	Art. 10	31	What is the status of implementation of the recommendations of the OSART missions to Goesgen (1999) and Muehleberg (2000)?	19	KKG and KKM set up a project team in order to implement the OSART suggestions and recommendations and both plants took appropriate actions to improve further their safety performance according to the results of the OSART-Report. HSK and KSA follow closely the activities in this area. The Goesgen OSART-Follow-Up-Mission was performed in March 2002. The result showed that one third of the total suggestions and recommendations are resolved, 2 have insufficient progress and the rest are in satisfactory progress. HSK follows closely the activities on all issues until they are resolved. The follow-up mission in Muehleberg will take place in June 2002. Muehleberg has implemented solutions to all recommendations until end of 2001, and is now evaluating the efficiency of the implemented solutions. They are convinced that the result s of the follow up mission will be satisfied.
Art. 10	Art. 10	32	Has an assessment been made on possible consequences of the deregulation of the electricity market on the safety of the operating NPP's and the management of the liabilities?	20	The deregulation of the electricity market forces the licensee to optimise the operation of the plant in the sense that costs are reduced but safety remains at a very high level. HSK has to ensure that the safety is not weakened because of cost reduction measures. Since more than two years, HSK asks the management of each nuclear power

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Art. 10	Art. 10	32	It is reported that the Inspectorate is aware of the fact that the impending deregulation of the electricity market is putting a high economic pressure on the utilities, and that discussions between the Inspectorate and the operators about this issue and related problems are ongoing. Would you explain what discussions are ongoing between the Inspectorate and the operators about this issue and related problems?		plant twice a year the following questions: • Has the plant management got additional work to do which does not have a relation to nuclear safety? That means has the management now less time available to handle safety issues? • Education and training of the shift personnel and all other personnel working in radiation protection areas: has there been a cut because of the necessity to reduce the operation costs? • Maintenance on electrical and mechanical systems and components: are there any changes in the frequency, the methods, the volume? • Tests and functional controls of systems and components: are there any changes? • Use of contractors to perform safety related work in the plant: which conditions and requirements exist? Have these been changed because of the need to reduce costs? • Infrastructure in the plant to ease the work for the employees: have there been any changes? • Motivation of the personnel: what is done to keep the personnel fully motivated for safety issues? Are there changes? To face safety problems in context with the deregulation of the electricity market HSK has, in addition to the aforementioned questions, taken several steps: The staff has been augmented by two inspectors; a inspection programme has been developed to evaluate consequences of costs cutting; a system of safety indicators has been developed which should be able to detect early signs of deteriorating safety-levels in a plant. In addition to the HSK also the Nuclear Safety Committee (KSA) has an eye on adverse effects of the deregulation on nuclear safety.
Art. 10	Art. 10	32	The safety level shown is currently suitable and appropriate. However, in relation to the Article 10, in the report is stated that the coming deregulation in energy market could put a high economic pressure on the utilities. This could cause some “reduction or savings” on the safety measures. Is it currently being planned some strategy to face this possible problem in the future ?.		
Art. 10	Art. 10	32	In the forthcoming years the Swiss electricity market will be gradually deregulated. What measures will the Swiss government apply in order to ensure that the priority to nuclear safety is granted in an open electricity market and during the transition phase ?		
Art. 10	Art. 10	32	With the impending deregulation of the electricity market and the pressures this will inevitably bring to operators’ costs e.g. cutting staff numbers, how will HSK ensure that safety is not compromised?		
Art. 10	Art. 10	31	Two OSART missions took place in	21	In both plants a survey of safety culture was performed according a project

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			1999 and 2000 in the Goesgen and Muehleberg NPP's. One of the findings was a tendency towards complacency. Could you describe in more details the activity of self-assessment of safety culture by the utility ?		initiated by HSK and performed by the institute of work psychology of the university of Berne. The results are positive. Both plants implemented programs to foster safety culture. In the view of HSK the initiated activities are appropriate. The OSART follow-up mission on Goesgen NPP, which was concerned by the finding of a tendency for complacency, has stated that the progress in resolving the issue are satisfactory. Independently of the above activities, all Swiss NPPs initiated a program in order to develop safety indicators (input e.g. IAEA TECDOC 1141) that will serve as part of the self assessment of the plants' operational safety. The self assessment programs at all plants are in development (for safety culture the det norsk Veritas: International safety rating system is one of the elements which is in evaluation, other elements are the INSAG 4, 12, 13 etc.) . HSK is regularly informed about the progress of the working groups.
Art. 10	Art. 10	32	Please, enumerate the problems (15 questions), which are the subject of misunderstanding by Regulatory Body after regular periodic safety check (PSR) at Swiss NPP's.	22	The safety issues ordered by HSK have been: • To give proof that the lightening protection is adequate; if this proof can not be given, the protection system has to be backfitted. • To make a study, if a pressure relief device for the primary system could improve the accident behaviour of the plant. • To make a study on the advantages of a feed & bleed system on the secondary side. • To reinforce brick walls in the electrical building to withstand earthquakes. To make a study on the capability of the control room ceiling to withstand earthquakes. • To backfit the existing Safety Parameter Display System (SPDS) • To install a fully equipped emergency control room. • To improve the emergency-instrumentation. • To improve the system to retain aerosols and iodine in the auxiliary building. • To implement a system for triggering the sirens in the environment of the plant. This triggering has to be without delay and has to be done from the

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					plant. • To improve the Probabilistic Safety Analysis (PSA). • To improve some other technical issues.
Art. 10	Art. 10	32	It is not clear from the text that the civil appeal against the regulatory body requirements has reached a final conclusion. How many of the 15 items that the (unnamed) Swiss NPP appealed against have been resolved to the satisfaction of the Regulatory Body?		The Periodic Safety Review (PRS) of the nuclear power plant Goesgen (KKG) was completed in the year 1999. The results are published (Periodische Sicherheitsüberprüfung für das Kernkraftwerk Gösgen, HSK 17/400; the report is on the internet, www.hsk.psi.ch). The plant has not agreed to implement all the requirements HSK has imposed and has made a complaint. The issue is now resolved. KKG has to implement all the safety measures HSK ordered. Most of the issues are implemented, some of them have time schedules up to the end of the year 2003.
Art. 11	Art. 11	34, 35	Are there qualification requirements for contractor personnel?	23	The compliance with specific Swiss industrial standards (SVTI-Festlegungen) is required in the area of welding and non-destructive in-service inspections. For other areas there was no need for such a requirement by HSK up to now. The plants have their own evaluation programs and they try to hire the same qualified companies for the same activities. In some cases they require even the same persons to do a certain task. In the view of deregulation and taking into account the fact that contractors start to merge or even to disappear HSK will have a closer look to the contractor situation. The issue is a topic of the regular HSK-NPP management meetings.
Art. 11	Art. 11 Clause 2	34	It is reported that the replacement of retiring staff is planned well in advance, and the know-how transfer from providers to NPP staff is assured and takes place. Does the know-how transfer from providers to NPP staff take place only when retiring staff are replaced by new staff? How is the operating experience of retiring staff transferred to remaining staff?	24	Swiss NPP strategy is to receive the required know-how from providers to operate and maintain their plants in a safe manner. The transfer mainly takes place on the occasion of changes or replacements of components or systems. In the career planning and the planning of retirement a longer overlap (months to years) for the retiring person and its successor are provided. After such an "introductory period" with training on the job the new person takes over his new duties. In many cases this takes place well in advance of the retirement, so the experienced person is still available at the plant.
Art. 11	Art. 11	33	Has Switzerland estimated all the future	25	Yes. Since 1984 a decommissioning fund exists, in which all the Swiss nuclear

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	Clause 1 Art. 11		liabilities, including waste treatment and disposal, that are related to the currently operational NPP's?		power plants make contributions. The amount of these contributions is such, that at the end of a 40-years operation period all the costs for decommissioning are covered. The money necessary to decommission the plants is determined in decommissioning studies. The last update of these studies has taken place in the year 2001.
Art. 11	Clause 1	33	Although decommissioning of NPP's has not yet started, it would be useful to know how all future liabilities estimated?		A fund for the waste management after the shutdown of the plants exists since the year 2001.
Art. 11	Art. 11 Clause 1	33	The report states that other NPP owners are liable for decommissioning funds should one plant fall short, how is this legally justified?		The liability of the plants for a plant which fall short is stated in Article 11 of the Federal Order concerning the Atomic Energy Act.
Art. 11	Art. 11 Clause 1	33	Will the total predicted accumulations for all NPP's into the decommissioning fund be sufficient to cover the liabilities?		
Art. 11	Art. 11 Clause 1	33	If not, where will the funds come from?		
Art. 12	Art. 12	36	What is the status of the Safety Parameter Display System (SPDS) implementation at the Goesgen NPP, and when will the implementation be completed?	26	The implementation of the SPDS at Goesgen NPP is found in the final specification. Installation and verification stages are planned for the summer of 2002. A longer period of operating experience will follow, during which the shift teams shall use and validate this tool in comparison with the current plant instrumentation.
Art. 12	Art. 12 (also Art. 18 page 67)	36	Why did it take so long for Goesgen NPP to start the project of a SPDF (Safety Parameter Display System)? Was there a formal requirement for a SPDF installation? What is the status of SPDF implementation at Goesgen?		Many years ago, HSK asked all Swiss NPP's to add a SPDS. The SPDS was a result of the Three Mile Island accident (1979), which showed severe problems with the instrumentation of US-plants at this time. According to the operator Goesgen, these problems do not apply to European plants and European designs. As an issue of the Periodic Safety Review at the end of 1999, HSK has decreed the backfitting of a SPDS following the state of the art. Since replacement of the plant process computer at Goesgen NPP was already in progress, HSK has approved, that the SPDS can be incorporated into this project.
Art. 12	Art. 12	37	Please describe the "MOSAIK" method in more detail. What are the first results obtained with "MOSAIK"?	27	MOSAIK is a catalogue of questions used in the preparation of inspections. The catalogue contains issues concerning work preparation, work execution, work termination and house-keeping. During the preparation of their inspections, inspectors take questions appropriate to the inspection type and put a rating on the issue according to

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			How are human errors considered in the PSA?		their finding. The result is input to a database. The annual analysis gives only rough information on certain issues due to the low statistics. It is expected that a longer lasting evaluation period will allow trending. The results obtained so far did not unreal unexpected findings. The purpose of the tool is not only the early detection of changes in performance but also to broaden the view of the inspectors in order to have a look not only to specific results but also to the underlying processes. In accordance with the PSA state-of-the-art, the Swiss PSAs take into account three types of human errors that can have an impact on safety: 1) human errors in maintenance and testing that could leave systems in an inoperable state, 2) the omission of operator actions that are required in responding to expected and unexpected plant events and bringing the plant to a safe condition, and 3) a limited number of human actions that could lead to an initiating event. The estimation of the probabilities for the human errors is performed with a combination of the SLIM method (variants of this method), the THERP and related ASEP methods, and expert/engineering judgement. In each of the PSA studies of the plants in “full-power” operation, about 35-150 human actions in the event responses and up to about 350 errors in maintenance and testing are identified as potentially risk-significant, quantified and included in the PSA safety model. The features of the plant design are a central factor determining the number of errors and actions analysed in each PSA study.
Art. 12	Art. 12	36	It is reported that the Beznau NPP has installed an advanced system called "Alarm System and Computerised Procedures in the Control Room" in both units, and the Inspectorate granted the permit for the system in 2000. • Would you explain the outline of the system? • Is the system safety-grade? • How the Inspectorate evaluated the adequacy of the system?	28	There are two systems who use both the highly reliable (but not safety grade) plant information system as input: • the AWARE Alarm filtering system, displaying only the uppermost level of the alarm (i.e. TLOOP instead of all underlying alarms). Lower Alarm levels are accessible via CRT. • Using COMPRO the Shift Supervisor has the procedures and the corresponding plant data on the same screen. This reduces the communication demands between Shift Supervisor and Operators. In order to "synchronise" the operators with the procedures a special user (communication) concept was developed. There is required (enforced) communication at certain key points.

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			• When indications differ, which one overrides the other, this system or conventional display system? • What do operating personnel do in the case of system failure? • Is backup computer equipped?		The HSK's evaluation of the adequacy of the systems based on a systematic dynamic validation on the full scope simulator (3 shifts different scenarios). The conventional Alarm System and the Paper Procedures (identical in content to the computerised procedures) are still available and have priority in the case of any failure or doubt by the shift. In addition, during the use of the computerised procedures the stand-by safety engineer follows the event sequence independently from the shift, using a short version of the paper procedures checking the important steps and the branching to other procedures. A special procedure defines the validity of the computerised systems and the switch-over to the classical ones. Training is provided for both the computerised and classical systems. There is redundancy of the computers in the plant information system. Because of the backup by classical systems, redundancy of the AWARE/COMPRO is not necessary.
Art. 13	Art. 13	41	What is the status of ISO9001 Certification of the Quality Management system of HSK? How HSK considers the experience of going through the formal certification process?	29	The HSK-Quality Assurance System has been certified end of November 2001. The certification process has been of great value, since by this certification external experts have looked at the system and have given much good advice to HSK. Moreover, to fix a date for the certification gives the Quality Assurance System a high priority. Without this, other businesses would be said to be more important and the workload to finish the Quality Assurance System would not be performed.
Art. 13	Art. 13	39	Have all the improvements in the Quality Management arrangements at Goesgen, that were identified as needing to be made in the 1998 OSART, been completed to the satisfaction of HSK?	30	Yes. Goesgen implemented in 2001 their quality management system compatible with ISO-9001:2000 and IAEA 50-C/SG-Q.
Art. 14 clause (1)	Art. 14 clause (1)	45	With respect to the ageing, in the article 14, clause (i), how many of the components and parts of the first generation NPP's have been replaced ?, and, how long it is expected the first	31	In Switzerland all NPP's are requested to backfit the plants based on the state of science and technology. Therefore an ongoing process exists in replacing components and systems, based on operational, technological and ageing (safety) aspects. In addition to others, the following main components and

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			generation NPP's will last before they are decommissioned?		systems have been replaced because of ageing aspects: 1986 NPP Muehleberg, Replacement of recirculation loops because of indications of stress corrosion cracking 1993 and 1999 NPP Beznau I and II, Replacement of steam generators and adjacent parts of primary coolant piping, because of increasing degradation of steam generator piping and replacing of cast austenitic steel elbows. In all plants the tubing of the condensers have been replaced by new piping made of titanium alloys. There exists no limited life time for the first generation NPP's. Design basis for the main components was 40 years. Decision on decommissioning will be based on the actual safety status of the plants. Periodic safety reviews are requested for all NPP's.
Art. 14 Art. 14	Art. 14 Art. 14 Clause (i)	44 44	Are there any requirements to the core damage estimated rate in regulations or guidelines on PSA? What are the claimed core damage frequencies (CDF's) for the two first generation NPP's?	32	The Swiss nuclear regulatory body expects CDF values of less than 1E-5 for each Swiss NPP, considering both internal and external events. The plant-specific PSA studies demonstrate that this safety goal is achieved for all Swiss NPPs. However, currently there are no CDF criteria in any of our regulations.
Art. 14	Art. 14 Clause (i)	44	Will HSK accept a safety justification, for say a plant modification, which is based solely on the outcome of a PSA?		Safety justification should not be based on PSA only. PSA results are generally considered as one aspect of a safety justification. However, there were a significant number of backfits realised based on PSA insights only.
Art. 14	Art. 14 Clause (ii)	47	How many HSK site inspectors are there assigned to each NPP?	33	HSK does not have site inspectors. But for each site a "site co-ordinator" is nominated. He has the overview over all safety related issues for his plant and he co-ordinates the action of the HSK-inspectors.
Art. 14	Art. 14 Clause (ii)	47	What is the HSK policy for moving/rotating its NPP site inspectors?	34	The "site co-ordinator" rotates every four years. This period can be shorter or longer, depending on the ongoing work.
Art. 14	Clause (ii)	45	How does the regulator use the risk assessment data; for example in planning inspections, developing inspection procedures, developing technical specifications, and evaluating incidents ? How does the operator of the facility use the risk data?	35	It was decided to move towards risk-informed regulation, in order to optimise the given resources of the Swiss regulatory body. The specific goals and principles of the risk-informed regulation to be implemented are currently being discussed. The requirements on PSA applications still need to be defined. PSA applications considered reasonable include event analysis, review of tech. spec. changes, optimisation of the inspection program. Corresponding guidelines are under development.

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Art. 15 Art. 16	Art. 15 Art. 16 Clause 1	54 56	About the Environmental Radiological Surveillance: It is not clear the role of the licensee (utility) in the establishment and implementation of the environmental surveillance program. Who operates the monitoring system? About the (on line) automatic dose rate monitoring and emergency response data system (MADUK): What are the criteria for the location of the probes in the vicinity of the NPP ?	36	The following measurements are performed every three months by the licensee: The external exposition is determined with thermoluminescence dosimeters along the fence of the plant and in the environment for distances up to about 5 km. The deposition of radioactive substances on exposed sheets covered with Vaseline are analysed monthly in the laboratory using gamma spectrometry. The routine sampling and measurement of air, water, soil and plants are done by federal institutes and offices. Foodstuffs are controlled by Cantonal offices. The monitoring system (MADUK) is operated by the Swiss Federal Nuclear Safety Inspectorate (HSK). The criteria for the location of the MADUK probes are the following in descending order: (i) 1 probe in each political community in zone 1, (ii) 1 probe in each important area according to weather statistics, (iii) 1 probe in settlements up to a distance of about 5 km, (iv) 1 probe in each sector of 30 degrees and (v) 1 probe to compare with the nation wide monitoring system. The probes are mostly near public buildings. The distance from the probe to the next building is at least equal to the height of the building. The detectors are located 1 meter above ground, mainly on grass.
Art. 16	Art. 16 Clause 1	55	About the Severe Accident Management Guidance (SAMG):It is not clear how the SAMG will support the different emergency organisation teams. Is it possible to include a more detailed description on the SAMG ?"	37	A policy paper was developed with regard to the introduction of SAMG in Switzerland. The policy paper describes the essential elements deemed crucial for implementing SAMG in the Swiss licensing environment. SAMG supports the emergency response organisation of a specific plant in mitigating severe accidents and preventing or minimising off-site releases. The written procedures or guidance should support the leading organ of the emergency response organisation (in general, the emergency staff) in implementing optimum accident management strategies. The policy paper defines the general regulatory requirements for the introduction of SAMG. The development and the organisation of the emergency response team will be defined by each licensee.
Art. 16	Art. 16 Clause 1	56	About the distribution of information and instructions to the public, given directly or through the media: In order to avoid conflicting information, is there (or not) a joint organisation to prepare all information and instructions ?	38	In an accident situation, all official information concerning the triggering of countermeasures through radio-broadcasting is co-ordinated by the NAZ/CENAL. Additional information to the media and the public can be distributed by all involved responsible authorities in their own area of competence. Emergency exercises have shown, that the co-ordination of this additional information is very difficult and therefore information management is an important part of

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					each exercise. A satisfactory solution has not yet been found.
Art. 16	Art. 16 Clause 1	57	About the Emergency Planning Zones: What Is the size of the Emergency Planning Zone 1 for each NPP ?	39	The emergency planning zone 1 was originally calculated for each NPP according to a maximum dose criteria of 1 Sv due to external radiation from the cloud. For alerting purposes, the boundary of the zone 1 was then adjusted to the community boundaries. NPP Leibstadt and Beznau: The two sites are so close to each other (6.5 km), that a common emergency planning zone 1 with 13 communities has been established. NPP Gösgen: The emergency planning zone 1 contains 11 communities up to a distance of about 4 km. NPP Mühleberg: The emergency planning zone 1 consists of 7 communities. The community boundaries are very inhomogeneous in size, so that the emergency planning zone 1 is defined on the basis of parts of a community up to a distance of 2.8 km. For details see the web-page http://www.hsk.psi.ch Notfallschutz (in German)
Art. 16	Art. 16 Clause 1	58	About the KI distribution: What is the organisation responsible for the storage, distribution and replace of the stock piles of KI ?	40	The KI tablets will be replaced at the end of 2002. The new distribution concept has foreseen pre-distribution to the households within the emergency planning zones 1+2 (up to a distance of about 20 km). Responsible for the pre-distribution and the replacement of the KI tablets is the Federal Office of Health.
Art. 16	Art. 16 Clause 2	59	Regarding the early notification of the occurrence of events, we consider that international and bilateral agreements in force between neighbouring countries provide reliable arrangements. As far as information for the emergency planning is concerned, it should be considered that the degree of preparedness and the emergency features to be arranged are matters of national policy, which defines the level of risk to be protected against, and then the probability of the events to be included in the emergency plan, taking into account the effectiveness of the	41	3 of the 5 nuclear power plants in Switzerland are situated near the border to Germany. Therefore a direct alerting system to the Landratsamt Waldshut has been established. In an accident situation, all neighbouring countries will be alerted and informed in the same way as the Swiss cantons. In addition, Switzerland is part of the ECURIE and EMERCON notification systems For emergency planning and response, agreements between Germany and Switzerland ensure an adequate exchange of information during normal operation and in an accident situation. Within the framework of emergency preparedness, important data is exchanged through meetings held on a regular basis. Specifically, valuable information related to available safety features in the plant (e.g. venting system) and alerting procedures in the environment (e.g. rapid alerting system) is communicated in this way. In an accident situation, all information necessary to the German authorities for an appropriate emergency response and assessment of the off-site situation

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			safety features of the single considered plant. For example, the Italian policy is to include in the national emergency plan transboundary accidents, taking into account sequences with severe core degradation. It should also be considered that appropriate emergency response requires, besides early notification, information on the evolution of the event as soon as it becomes more precise. Moreover, also the level of this information depends to some extent from the degree of preparedness selected by the single State. In the light of the above considerations, the provisions taken or planned for providing information complying with the article 16, clause 2, of the Convention should be clarified, as well as the practical procedures with which neighbouring countries can obtain data considered necessary. Such data could for instance include: Core inventories at equilibrium (which are not available, as they may strongly depend on the decision to load fuel of advanced design); Available Emergency Features (e.g.: in Containment Spray Systems, Hydrogen management systems) and their effectiveness, peculiar Severe Accident Management Systems' characteristics (such as containment purge and filtration devices); Results of probabilistic safety studies, if any.		will be provided at regular intervals by the NAZ/CENAL or HSK. This information includes on-site accident progression and possible releases to the environment , meteorological data from the plant site and results from atmospheric dose calculations performed by HSK for distances up to about 30 km from the plant. In order to avoid incongruity due to different calculations, it has been agreed between Germany and Switzerland, that both sides shall use the same atmospheric dose calculations as a basis for emergency response.These calculations are performed by HSK using a model, that correctly takes into account topography and measured wind fields in the vicinity of the Swiss nuclear power plants.

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Art. 16	Art. 16 Clause 1	57	In the light of the recent work undertaken by WHO, which identifies a higher risk of thyroidal cancer to young children from radioiodine, have the dose intervention levels for taking stable iodine tablets been reviewed in Switzerland? And if so what is the outcome of the review?	42	A discussion of the intervention levels is underway, especially with regard to fixed values instead of dose ranges. Concerning the KI intervention levels, the proposals of the WHO and IAEA have been discussed. In the last exercises the lower intervention level of 30 mSv - according to our dose intervention criteria - has been used. In addition , we believe, that the iodine source term in an accident situation can not be determined accurately so that administration of KI is normally used automatically in connection with sheltering.
Art. 16	Art. 16 Clause 1	59	The report does not give much detail in relation to exercises, it seems that there are reasonably frequent on and off site demonstration exercises but does Switzerland ever conduct a national emergency exercise where federal organisations have a role to play?	43	Each NPP must conduct an emergency exercise every year (with different scenarios). Every two years a national emergency exercise with participation of the Swiss Federal Emergency Organisation and the canton is conducted (each time for a different nuclear power plant). The next federal emergency exercise will take place 2003.
Art. 17	Art. 17 Clause (iii)	62	What is the status of the probabilistic seismic hazard analyses that have been performed for the Swiss NPPs, and what are the (preliminary) results?	44	Today, the operators of the Swiss NPPs are jointly carrying out the probabilistic seismic hazard analysis required by HSK. HSK has implemented a participatory peer review process in order to continuously scrutinise the course of the project conducted under the name PEGASOS ("Probabilistische Erdbebengefährdungsanalyse für die KKW-Standorte in der Schweiz"). The main element of the project are workshops, altogether approx. nine of which will be conducted. The first workshop took place in 2001. The bulk of six workshops is scheduled for 2002. Within the framework of these workshops earth-scientific data characterising the seismic sources, the ground motions, and the site response are determined by use of structured expert elicitation. The data elicited from different expert groups will serve as input to the hazard computations finally conducted. The expert elicitations are arranged such that evaluations representative for the informed technical community will result. No hazard results are available yet. A first series of (preliminary) hazard results will be developed just prior to a workshop currently scheduled for February 2003. However, remarkable results were already achieved as part of the preparatory work of PEGASOS. For example, in an HSK supported paleoseismic investigation conducted by the Swiss Seismological Service an active fault was identified in the epicentral area of the Basel earthquake of 1356, the largest historical seismic event in central Europe [Science, Vol. 293, 14 Sept. 2001].

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Art. 17	Art. 17 Clause (iii)	62	The report briefly mentions an evaluation of relevant safety factors for new developments in the vicinity of a NPP. Could more detail be provided as to how this process works formally, including: what the relevant factors are, what influence the HSK has in any proposed residential/industrial development and which body makes the final decision to allow a development to proceed ?	45	For a new nuclear power plant the influence of surrounding dangerous plants, such as chemical plants and transport systems, are considered in the evaluation of the nuclear safety. For existing nuclear power plants, the canton and communities are responsible for granting permission of proposed non-nuclear facilities in the environment of the nuclear power plant. In case of dangerous facilities, the nuclear safety authority will normally also be consulted concerning the influence on the nuclear power plant.
Art. 18	Art. 18 Clause (i)	65	About Containment Venting Systems: Since the systems have been implemented in early 1990's in all NPPs, but their use will only now be included in the Severe Accident Management Guidelines, how have been these systems been tested and operated during this period?	46	The venting systems are operational since installation. (See answer for question 47). The testing of the system includes the operability of the valves, and the water inventory of the washer/scrubber. Flow testing of the (passive) scrubber is not required. However, one plant has done it after a containment leak rate test. The venting flow was as designed.
Art. 18(i)	Art. 18	65	All NPPs in Switzerland have been backfitted with filtered containment venting systems. Was this a regulatory requirement? Which design criteria were used for the venting systems and why will the use of these systems not be put in force earlier than 2003?	47	This was a regulatory requirement. The main design criteria are: Capacity in decay heat ≈ 0.5% for PWR's, and ≈ 1% for BWR's. Active venting by a valve, and passive venting by a burst disc. Decontamination factor of 1000 for aerosols, and 100 for elementary iodine. The venting systems are ready for use since 1992 or 1993. Special emergency procedures require manual venting at a predetermined containment pressure. If manual venting is not performed, passive venting occurs at a 20% to 30% higher containment pressure.
Art. 18(ii)	Art. 18	66	The Swiss SIA code was used for civil engineering, and load combinations were developed and incorporated in the design. Which load combinations and which safety factors were required for	48	Main loads (dead weight, operational loads, temperature, etc.) are combined with LOCA loads and SSE earthquake. Safety factor considered for this load combination = 1.5 against yield strength of reinforcing steel bars. Aircraft crash loads have been combined with main loads. Safety factor considered for this load combination = 1.0 against yield strength of reinforcing

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			LOCA, earthquake and aircraft crash?		steel bars. Information is valid for NPP Leibstadt.
Art. 19	Art. 19 Clause (ii + iii)	70	What measures have been planned both by the regulatory authorities and the utilities to tackle the problem of the continuous decrease of nuclear know-how and capacity in Switzerland?	49	HSK is revising its regulation on Organisations of NPPs (to be in force by mid 2002). This document is strongly based on INSAG-13 Management of Operational Safety in NPPs. It contains a special chapter on Management of Change, i.e. the preservation of plant internal competence has to be managed. At the same time, the regulation on Qualification and Training in NPPs is revised and extended from licensed personnel to the whole staff of NPPs. This document in addition requires adequate attention for the preservation of plant internal competence. Preserving competence is an issue of regular Management Meetings between HSK and NPPs. HSK has no direct influence on the country-wide competence in the nuclear area (i.e. Universities, Technical Institutes, Industry, etc.) However, HSK initiates, co-ordinates, controls and finances research activities in the area of nuclear safety. This is an indirect contribution to maintaining competence in the nuclear field.
Art. 19	Art. 19 Clause (iv(	72	Is there any more recent case where operational experience feedback has had a repercussion in Switzerland?	50	Recent examples were the HSK has requested a safety evaluation from the Swiss BWR's where: • NPP Phillipsburg-2 "Boron concentration below specification in borated water storage tanks of 3 out of 4 ECCS trains" (INES 2) Oktober 2001: HSK has required a safety evaluation from NPP Gösgen. In December 2002 a HSK team inspection has been performed. No deviation has been detected. • NPP Brunsbüttel: Destruction of piping inside containment,(INES 1) February 2002: The Swiss plants have their own internal OPEX programs. The information exchange between plants within the country is established. Additionally, the plants are members of the WANO OPEX network and established organisations within the plants distribute the gathered information. The plants have to report (on a quarterly basis) to the HSK the external events discussed in the plants' internal safety committee. HSK transfers relevant information from the IRS-System to the NPPs and requires from the plants a statement about the relevance of the external

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					events to their installations and the actions taken by the plant.