General questions

The paper does not show NPP management structure and its interaction with federal authorities.
See Attachment 2.

Since the licensing is performed according to the regulations of the supplier country, a clarification of the process of applying the Supplier's Codes & Standards in Slovenia is needed.
Licensing of the NPP Krsko was done in accordance with domestic legislation. Slovenia however has not developed specific standards, technical criteria and quality norms for the design and construction of nuclear facilities. In the case of Krsko NPP US codes and standards were applied.

Article 6: Existing Nuclear Installations

Planned activities to improve safety As indicated, Slovenia plans to phase out nuclear energy in 2023. This nuclear power phase-out may induce problems on the personnel motivation and turnover and the recruitment of competent engineers. Is it planned to investigate this potential long-term problem?
Slovenia is aware of this problem. The motivation at the NPP is currently maintained by the other means such as higher incomes comparable to the local environment, highly professional work environment, etc. In any case some of the negative aspects of the personnel motivation will emerge, as the phase out will be coming closer. There is no systematic investigation on this problem yet to find the acceptable and effective solutions to this problem. It is fully agreed that this problem should be investigated before the consequences become unmanageable. After completion of the plant modernisation the action will be initiated to properly address this problem.

Many countries perform a complete safety review with a time period of 10 years, with the objectives of checking that the plant complies with the regulatory requirements, of re-analysing the operating experience and of examining how to take into account new safety concerns. Is Slovenia of the opinion that its strategy concerning safety reviews allows fulfilling these objectives?
SNSA has already followed the intention of the PSR. After the first ten year period SNSA requested from the NPP Krsko to perform complete PSA: level 1 and 2 for internal and external events and shutdown PSA and several deterministic analyses (Station Blackout, Fire Hazard, etc). The seismic input to the original design has been reinvestigated. Re-analysing the operating experience and examining how to take into account new safety concerns is a permanent function of the NPP Krsko and the SNSA. Checking that the plant complies with the regulatory requirements is a function of the SNSA. FSAR is regularly updated and subject to Regulatory Review to reflect all the changes made. Nevertheless Slovenia is considering inserting formal requirement for the Periodic Safety Review into new legislation which is under preparation.

Year 2000 Computer Issue How does Slovenia ensure that the licensee has an adequate strategy and action plan in place to deal with the year 2000 safety issue?
The activities on the Y2K problem have started at the beginning of 1998. NPP Krsko was required to prepare and present to the Slovenian Nuclear Safety Administration (SNSA) an action plan to deal with the Y2K safety issue. The action plan was prepared based mainly on the guidelines and method definition documents of Nuclear Energy Institute: NEI/NUSMG 97-07: Nuclear Utility Year 2000 Readiness (October 1997)and NEI/NUSMG 98-07: Nuclear Utility Year 2000 Readiness Contingency Planning (Aug. 1998) and on the recommendations of the IAEA and EU. Besides reporting by the NPP Krsko to the SNSA the progress on the implementation of the plan is regularly inspected by the SNSA inspectors.

What is the schedule for completing the improvements programme for Krsko NPP? Are all the issues identified by the international missions and SNSA included?
In the report only the most relevant safety improvements were mentioned. The complete improvements programme in the framework of the plant modernisation will be finished by the end of the year 2002. Full scope plant specific simulator will be operational by end of 1999, steam generator replacement and power upgrade will be completed in the year 2000. The complete list of issues identified by international missions is included. However improvement of the plant based on the feedback of international and internal operating experience is a permanent activity.

It is reported that almost all findings and recommendations from the ICISA mission have been resolved 1997. Which safety standards were used in the ICISA safety review? Are there still open issues? Which?
ICISA had no verified safety standards for its work. Members of the Commission were working based on their knowledge and experience. There is no major outstanding issue stil open. Steam generator replacement and installation of the plant specific full scope simulator are in progress and will be completed in the year 2000.

Which time schedule exist for the Fire Protection Action Plan introduced as a consequence of the PSA?
Based on the Fire PSA and Fire Hazard Analysis the Cost-Benefit analysis of safety improvements was performed resulting in Fire Protection Action Plan (FPAP). Three priority categories of modifications are established based on the contribution to the CDF and averted dose investment effectiveness. The first one is empty. That means that there is no modification which satisfies criteria of cost benefit effectiveness less than 1000 USD per person-rem dose reduction for modifications which reduce CDF > 1.0E-6 1Ry. The second one comprises the four sub-groups of modification that should be implemented up to the end of 1999. The third group (CDF< 1.0E-6 1/Ry) comprises approximately five sub-groups of modifications that should be implemented up to 2003.

Do the results of the NPP Krsko PSA study indicate need for additional seismic analysis? If yes, please indicate specifically what kind?
The PSA study itself didn't indicate any need of additional seismic analyses. The request or better suggestions came out from the IAEA technical review of the NPP Krsko PSA study. There it was recommended that additional geophysical and geological investigation of the vicinity of NPP Krsko should be conducted to reduce uncertainty related to seismic inputs. These investigations are in progress.

The US regulations have been followed in Slovenia. How these regulations, and their revisions, have been adapted in the Slovenian legislation? How the own needs and the development of technology and science in Slovenia are taken into account in the safety regulations, taking into account also severe accidents?
Licensing procedure for the NPP Krsko was executed in accordance with domestic legislation. Slovenia however has not developed specific standards, technical criteria and quality norms for the design and construction of nuclear facilities. In the case of Krsko NPP US codes and standards were applied directly during design, construction and commissioning. Essential licensing documents were PSAR and FSAR as per USNRC Regulatory Guide 1.70. During the operation Section 37 para 2 and 3 of the 1984 Act applies, which allows in such case that, technical criteria or quality norms and rules established by international or foreign technical regulations or international and foreign standards may be applied.

Could you please provide a more detailed schedule for safety improvements mentioned in the report? Are there specific safety improvements for severe accidents? How the financing of planned safety improvements has been ensured?
NPP Krsko is continuously implementing safety improvements. Planed safety improvements mentioned in the report are under implementation and will be completed by the year 2002. Detailed schedule is not presented because of its size. There are several specific improvements for severe accidents. Replacement of both safety battery train?s with larger capacity, change of dry Rx cavity design with wet Rx cavity design and development of plant specific SAMG^s. Financing of planned safety improvements is ensured by yearly budget, which is proposed by plant management and approved by management board.

Article 7: Legislative and Regulatory Framework

Is there any proposal to establish a requirement on Periodic Safety Reviews in Slovenia?
The question whether to insert into the new legislation (which is under preparation) a requirement on Periodic Safety Reviews is still under consideration. (See also the response to a French question on Article 6 and to a Italian question on Article 7).

It is not clear which Slovenian body reviews applications for NPP site and construction licences from radiation protection viewpoint; the Slovenian Nuclear Safety Administration (SNSA) appears only to review aspects related to nuclear safety (see on page 22 of the Report).
The term nuclear safety on page 22 of the report should be interpreted broadly as nuclear, radiation and waste safety. SNSA has overall competence in reviewing also the radiation protection aspects of the application in the licensing process. The Act on Organisation and Field of Activities of the Ministries of 1994 sets the competence of the SNSA also in the field of radiation protection in nuclear facilities.

As to enforcement two questions arise. The first is that nowhere in paragraph 7.3 on pages 23-24 of the Slovenian National Report suspension and revocation of licences are mentioned. How are these two administrative measures, explicitly provided for in the Convention, enacted?
The 19 Yes, the 1984 Act in its Section 62 covers also these aspects of the enforcement. The competent authority (SNSA) has a power to discontinue the operation of sources of ionising radiation (suspend the license) and to revoke the licence for the utilisation of radiation sources.

The second question is: if there is a case of sanctioned non-compliance by the licensee, who decides on legal action being brought against the licensee?
SNSA has the power to independently decide on legal action being brought against the licensee. SNSA may submit a request to bring legal action for an offence or a notification of a criminal act if, in the course of its supervision it establish non-compliance with regulations which are sanctioned according to the provisions of the 1984 Act and other regulations.

Considering that the operating license in Slovenia is not explicitly limited in time and that there are no formal requirements for performing Periodic Safety Reviews (PSR), what regulatory instruments are in use to ensure that a systematic approach to an integrated assessment of the plant safety is guaranteed? Are there any plans to enact formal requirements to this effect in regulations?
Although there is no formal requirement for performing Periodic Safety Reviews in the legislation, Regulation E-1 requires from the licensee to permanently follow and analyse the safety status of the plant bearing in mind experience of the nuclear industry and technological development. Slovenia is considering inserting requirement for the Periodic Safety Review into new legislation which is under preparation. The Regulatory body has followed the intention of the PSR.. After the first ten year period SNSA requested from the NPP Krsko to perform complete PSA: level 1 and 2 for internal and external events and shutdown PSA and several deterministic analyses (Station Blackout, Fire Hazard, etc). The seismic input to the original design has been reinvestigated.

Are there plans to update the 1984 Act? If so, what is the schedule for the completion of this review? What will be the new aspects included in this revision?
From the very beginning of Slovenian independence there was intention to update / review nuclear safety legislation. The first step was done already in 1993 when the draft of new "nuclear and radiation safety Act" and new "Third party liability Act" were prepared for internal use. At that time also some pieces of international legal frame were under preparation as for example Nuclear Safety Convention, Revision of Vienna Convention, Convention on Supplementary Compensation for Nuclear Damage and Joint Cconvention on the Safety of Spent Fuel and on the Safety of Radioactive

Waste Management. Waiting for outcome of these international instruments delayed the process of updating the domestic legislation in this field. On the other hand Slovenia is approaching the European Union which means that we will have to harmonise our legislation with EU legislation. Transposition of different directives into Slovenian legal system has already started. It is planed that by the end of 2000 the new "nuclear and radiation safety act" and "new third party liability act" will be in Parliament procedure.

Regulatory functions in Slovenia are assigned to SNSA. Due to the fact that Krsko plant is owned 50 % by Croatia, what is the regulatory responsibility of the Croatian agencies, if any?

Since the Krsko NPP is located on Slovenian territory 100 % of the regulatory responsibility rests and is executed by the Slovenian regulatory authorities respectless of the ownership of the plant.

More information about the ownership is given in the National report on page 38 and in our answer to the Austrian question on Article 11.

Section 7.2 states that four phases of licensing are established in Slovenia. Given this, at the first two phases the competent authority is the Ministry of Ecology and Territorial Planning while at the subsequent phases the competent authority is the SNSA. So, who issues licenses for all the above phases?

As it is stated in Slovenian National Report on page 19 under the subtitle ?Licensing system? the Ministry of Environmental and Physical Planning issues the site and construction license. SNSA as the regulatory body (for nuclear, radiation and waste safety) within this Ministry is engaged only in the form of a previous consensus; in this two stages SNSA only reviews and evaluates environmental impact assessment for site license and PSAR for the construction permit. The commissioning and operating licenses are granted based on the review of the FSAR by the SNSA itself.

How is the process of issuing operation and decommissioning licenses defined by legislation?

We believe that the process of issuing the operation license is extensively described in our national report under the subtitle Licensing System (pages 19-22); references and even quotations of relevant sections of the 1984 Act and relevant regulations (E2 and E1) are also given. With respect to decommissioning license the 1984 Act is rather short. In its Section 43 it is stated that the operating organisation (licensee) shall, pursuant to the provisions of 1984 Act, pass and apply instructions and other acts related to the operation of the nuclear facility, among others also - programme of measures and procedures for the decommissioning of the nuclear facility. Some provisions on decommissioning can be find also in section 12 and 13 of the 1984 Act:

Section 12

If the operator of the nuclear facility has the intention of decommissioning the facility, he shall submit prior notification to that effect to the competent body".

Section 13

The operator of the nuclear facility who has decommissioned the facility shall within the time-limits determined by the competent body undertake adequate remedial measures at the site, the facility itself and its surroundings in the manner which, pursuant to this Act, provides for the environmental protection from ionising radiation".

Further more the section 32/2 requires:

"The safety report shall be amended in accordance with the changes which arise in the project design during construction, commissioning, start of operation, operation and decommissioning of the nuclear facility".

Some detailed provisions could be find in Regulation E-1. Most important is section 46 of the Regulation:

"The decommissioning programme of a nuclear facility is performed pursuant to a license issued by the competent regulatory body (SNSA).

The licence referred to in Para 1 of this Section shall be granted, if, according to the decommissioning programme and

other required documents, the radiation protection has been assured".

Section 7.2 states that the competent authority who issues the license for the start of operation defines operating limits and conditions for a nuclear installation. How and on the basis of what are these limits and conditions formed?

Operating limits and conditions are based on StandardTechnical Specifications for Westinghouse (NUREG). On the basis of safety analyses (FSAR Chapter 15) the licensee prepares plant specific operating limits and conditions for a nuclear installation. The Regulatory Body afterwards extensively reviews them. They are required by the 1984 Act to be submitted with the application for the Operating License. The Operating limits and conditions (Technical Specifications) become licensing document with issuance of the Operating License. Any changes to the operating limits and conditions are subject to prior Regulatory Body review and approval.

Krsko NPP is still jointly owned (50-50) by Slovenia and Croatia. How does this affect the ultimate responsibility for nuclear safety and emergency preparedness, not least with regard to financial and liability provisions? Which formal relations exist between the two owners and the operating organisation?

The information about the ownership is given in the National report on page 38 and in our answer to the Austrian question on Article 11.

Since the Krsko NPP is located on Slovenian territory the whole regulatory responsibility and functions rest on Slovenian regulatory authorities (including responsibility for nuclear safety and emergency preparedness). Also all financial and liability provisions with respect to safety of Krsko NPP are governed by Slovenian legislation which includes (beside domestic laws) also international legal instruments to which Slovenia is a party. Relations between two "owners" and the operating organisation (Krsko NPP) are formalised by establishment of Managing Board where the representatives of both, Slovenian and Croatian side are represented.

Article 8: Regulatory Body

When is it planned to fulfil the number of permanent staff according to European Union mission RAMG (1993)?
At very At this moment 35 permanent positions out of 48 at SNSA are occupied. As it can be seen from a scheme in page 27 of the Slovenian National Report the number of employees in SNSA is increasing from year to year. But at the same time there are some financial and budgetary restriction at the governmental level which do not allow - for time being - to fulfil in whole the organisational chart.

As per paragraph 8.1 SNSA decrees can be appealed to the Ministry of Environment and Physical Planning, the same point about effective independence of SNSA can be made as it will be in the comment under Clause **Clause 1. Financial and Human Resources** The question of adequacy in human resources available to the Slovenian Nuclear Safety Administration (SNSA) (page 27) ought to be addressed, inter alia because the SNSA Division of Nuclear and Radioactive Materials appears also to be responsible for supervision of trade, transport and handling of radioisotopes used in medicine, industry and research (see on page 28). **Clause 2.** The question of effective separation between the functions of the SNSA as regulatory body and other bodies concerned with promotion or utilisation of nuclear energy is not entirely clear. As the Slovenian Nuclear Safety Administration comes under the Ministry of Environmental and Physical Planning, the functions and the responsibilities of the latter ought to be expanded upon.
With respect to human resources see answer to Brazilian question above. With respect to separation of regulatory and promotion function of different regulatory bodies we believe that the historical background and present status of SNSA are well explained in the National report on page 24.

It is stated that SNSA is an independent State administration, but no Information is provided on how this is accomplished and preserved. Since SNSA reports to the Government, how it is assured the independence of regulatory policies from Government policies supporting or opposing the use of nuclear energy? Is that reflected in the appointment and removal of the SNSA Director?
SNSA has been in the past (from 1987 to 1991) an independent and functionally autonomous body and directly responsible to the Government and to the Parliament of the Republic of Slovenia. In 1991 it become a part of the Ministry of Environment and Physical Planning. The Government policies supporting or opposing the use of nuclear energy had no direct influence on the work / independence of the SNSA since its responsibility is to insure that the nuclear safety provisions of our legislation are applied by licensee. For the time being there was no evidence of ?political? influence on the work of the SNSA. As stated in the National report, page 25, the Director of SNSA is appointed and discharged by the Government on the motion of the Minister. Based on legislation there is a possibility that Government which opposes the use of nuclear energy would discharge the Director of SNSA but since SNSA is not a promoter of nuclear energy but rather promoter of nuclear safety this is not expected to happen.

It appears that SNSA has not its own budget, but is part of the budget for the Ministry for Environment and Physical Planning. It is stated that more than 30 % of the staff positions in SNSA are not occupied at present. Are current resources sufficient for fulfilment of the basic functions?
SNSA has not its own budget but it is a part of the budget of the Ministry of Environmental and Physical Planning. Once approved by the Parliament SNSA has all the rights for its execution. SNSA's share in Ministry?s budget was in 1998 around 2 %). Budget is the only source for financing the SNSA basic activities. Most expense incured in the licensing process (expertize, analyses, etc.) made by independent TSOs are reimbursed by the licensee. The amount of available financial resources in the budget is estimated to be sufficient for the regulatory tasks. However the amount allocated for

financing of R&D shows trend of decreasing in the last few years. There is a Governmental restriction in available funds for opening new posts.

Several relevant organisations are mentioned in the report with regulatory or control function. How is the co-ordination of these agencies with SNSA ensured?
The co-ordination of several relevant organisations (or better relevant authorities) with the SNSA is ensured through participation of their experts in the work of the Nuclear Safety Expert Commission which is attached to the SNSA. This Commission has only advisory role but important licenses issued to the nuclear facilities and drafts of the laws and regulations have to get the commission's positive opinion. Co-ordination between all these relevant regulatory authorities with respect to inspection activities is done on the ad-hoc basis and it must be pointed out that there were some minor problems in the day to day activities with respect to the overlapping of the competencies in some areas such as fire protection, physical protection of nuclear materials and facilities, radiation protection, etc.

How is the technical support to SNSA on issues of nuclear reactor physics performed?
For the reactor physics issues (reactor core design, criticality analysis, start-up physics tests, etc.) SNSA has support of TSO, in this case Institute Jozef Stefan Reactor Physics Dept.

It is mentioned in 8.1 that in 1991 SNSA lost some of its independence and autonomy and further that SNSA decrees can be appealed to the Ministry of Environmental and Physical Planning. Please explain how this could restrict the regulatory work.
SNSA is autonomous in issuing decrees within its field of competencies to the licensees. In the licensing process SNSA has newer been influenced by the Ministry. The independence might be questioned regarding budget and manpower planning. Reporting to the Government and to the Parliament is channelled through the Ministry. SNSA has no competence for issuing regulations, the drafts prepared by SNSA are adopted by the Minister or by the Government. There is a legal provision in the legislation, which would empower the Minister to issue obligatory instructions to all subordinate Bodies within the Ministry; but these instructions are related only to general administrative issues and do not interfere with the regulatory process. With respect to the appeal process it has to be stressed that the procedure could take few months on the second level (Ministry) and might be even longer (few years) if the next level is supreme court at which the case may come. In all this period the important safety related issue is unsolved and open.

From what is reported in 8.1 it could be concluded that concerning nuclear emergency, physical protection and radiation protection the responsibilities are divided between different authorities and also shared with the Jozef Stefan Institute. It is also mentioned that some responsibilities are overlapping. How clearly are these responsibilities defined? Which problems are created by the overlapping responsibilities?
Responsibilities (or better field of activities) are defined generally in the Act on Organisation and Field of Activities of the Ministries. Within this Act the competencies of different ministries are more or less well defined but there is always possibility of misinterpretation of same provisions. On the other hand competencies and responsibility of ministries and / or regulatory bodies on lower level are defined also in acts and regulations which are covering different areas of nuclear and / or radiological matters. Just for clarification it must be pointed out that Jozef Stefan Institute has no regulatory function, it is only one of several TSOs which provide support to SNSA in the licensing process and which does R &D in the field of nuclear safety. Overlapping of responsibilities does not create a major problem; potentially the Government could always solve the problem if any of involved ministries would require the solution of so called "positive dispute of competence".

How many inspectors are included in the staff of SNSA? Are they stationed at Krsko? It is reported that only 33 positions out of 48 at SNSA are occupied? What are the reasons for the vacancies? How do they affect the work of SNSA? What is planned to remedy this situation?
The Division of Inspection Control of the SNSA has a head of division and four inspectors (together 5 inspectors). There are no resident inspectors who have an office on site (Krsko NPP) but the continuos monitoring of the NPP's performance is carried out through the planned inspections twice a week by (normally) two inspectors (see more in

National Report on page 27, 28).

The reason that only 35 positions out of 48 are occupied is basically in the fact that SNSA started back in 1988 with only 5 staff members. Due to the fact that increasing of employment in state administration is unpopular among general public and that Government general policy in this respect is for several years very restrictive we believe that the trend presented in scheme on page 27 of the National Report is encouraging.

The fact that the SNSA is understaffed is reflected in the pressure on existing staff members who are engaged in many different tasks not only on nuclear and radiological safety issues but also on administrative, financial, personal and other. In worst cases this results in young engineers quiting the jobs in SNSA. Since we are part of international "nuclear" community with (sometimes) demanding on-going activities and since we are in the middle of the accession process towards the European Union, the day to day activities which should be done are sometimes delayed. Plan for the correction of this situation is basically a part of the overall governmental policy to improve efficiency and effectiveness of the Governmental administration possibly also by increasing its staff.

Does SNSA have an implemented QA-programme for regulatory work? How is it structured and audited?

SNSA has no overall QA-programme for the regulatory work. QA procedures are being developed with lower priority although the need for the programme has been recognised. There are in use Administrative Procedures for the functioning of the Administration, Inspection Manual Procedures and Emergency Plan Procedures. Help is received in the preparation of the procedures from the EU through the RAMG (Regulatory Assistance Management Group) Programme. SNSA is subject of auditing for the regulatory work by the Ministry of Justice and by the Ministry of Finance for the financial policy. Besides, SNSA work is reviewed by different missions of the IAEA and EU. IRRT mission is planned for the end of 1999.

It is mentioned that the Division of Nuclear Safety performs different analyses but has rather limited resources. Which is the role of SNSA with regard to performing vs. reviewing PSA, event analysis, experience feedback analysis as compared to TSOs and the operating organisation?

SNSA does not perform complex safety analysis by itself but requests the licensee to provide necessary analysis in the licensing process and TSOs to perform independent review of such analysis. SNSA is developing capabilities for review and regulatory assessment of safety analyses, experience feedback analyses, etc. performed by plant or TSOs.

Nothing is said in the report about the budget of SNSA. How is the budget determined? Which is the estimation of sufficiency with regard to the regulatory tasks? Which resources exist to contract the mentioned TSOs and to sponsor research and development to support regulatory development?

Budget of the SNSA is determined on the basis of the realisation in the previous year, taking into account new needs in the planning year which have to be well justified. Budget is the only source for financing the SNSA basic activities and is about 1.36 Mio EURO. Most expense incured in the licensing process (expertize, analyses, etc.) made by independent TSOs are reimbursed by the licensee. The amount of available financial resources in the budget is estimated to be sufficient for the regulatory tasks. However the amount allocated for financing of R&D shows trend of decreasing in the last few years. There is a Governmental restriction in available funds for opening new posts.

What is the reason of the decision by the Slovenian Government that has lead to a decrease in the independence of the regulatory body?

When established in 1987 SNSA was an independent regulatory body reporting directly to the Government and to the Parliament. New Act on Organisation of the State Administration of 1991 abolished at the Governmental level all the independent bodies without any exception and put them under the Ministries. So the SNSA became a part of the Ministry of environment and physical planning.

Article 9: Responsibility of the Licence Holder

Has a Slovenian licensee a right of recourse against his employees (in particular those in operational control) if they cause a nuclear damage either by their negligent behaviour or with the intent to cause such damage ? If this the case is this right of recourse granted on the basis of the labour contracts entered into between the license holder and its employees or otherwise?
A Slovenian licensee has a right of recourse against his employees based on both Contract on Employment and Internal Rule on Disciplinary Liability of the Krsko NPP employees.

According to point 7.3. of the National Report, inspectors are empowered to submit requests for legal action against the licensee. Is it possible for the Slovenian authorities to impose administrative sanctions ? If this is the case, what kind of sanctions can be imposed for what kind of offences ? In case these sanctions are fines, what are the amounts the license holder or its employees can be fined?
Yes, Slovenian authorities are entitled to impose administrative sanctions. The SNSA may order to discontinue the operation of NPP (suspend the license/shut down the plant) and revoke the license for its operation. Penal previsions in the 1984 Act include more than 30 different offences on which the fines can be imposed by the competent court. In the past SNSA had submitted few requests for legal action to the court in cases when in the course of its supervision SNSA established non-compliance with regulations. Sanctions are imposed on operating organisation and the responsible person, i.e. Director General at the same time. Maximum fine for offence is 10 Million SIT which is approx. equivalent to 50.000 EUROs. Criminal acts are regulated in the Penal Code.

Does Slovenia intend to become a party to the Convention on the Protection of Environment through Criminal Law (European Treaty Series/172), opened for signature in Strasbourg on 4 November 1998, which deals, in particular, with intentional and negligent offences committed by means of nuclear substances or installations?
Slovenia had participated in drafting the Convention. Signing of the Convention is under consideration.

Regarding the financial responsibilities of the operator for potential damages to the public or the environment. How are they guaranteed? Has the SNSA any review responsibilities before granting the license?
Financial responsibility of the operator for potential damages to the public or the environment as determined by the Vienna Convention on Civil Liability for Nuclear Damage is applied for the NPP Krsko from 1981 when the first nuclear fuel arrived to the site. Domestic laws from 1978 and 1980 on third party liability and on compulsory insurance are in accordance with the Vienna Convention. The operator is insured by the Nuclear Insurance and Reinsurance Pool Ljubljana with the Third Party Liability Insurance Policy. The amount of liability of the operator in case of nuclear accident was in 1998 amended by the Government from the amount called for in 1965 Vienna Convention to 42 million US $ per nuclear accident. Before granting Operating License the applicant has to show that the facility has proper insurance in place. When executing the inspection, SNSA has power to control the maintenance of the insurance coverage.

Who is the highest representative of the operating organisation/licensee bearing the legal responsibility for safety at the plant?
The highest representative of the operating organisation/licensee bearing the legal responsibility for safety at the plant is the Director General.

What is the legal responsibility of the license holder considering safety items not covered by the licensing requirements (considering that no explicit legal requirement for complete and undivided responsibility exists)?
There is a general requirement in the 1984 Act holding the licensee responsible for taking necessary measures and initiatives to upgrade safety in response to the feedback of operating experience in nuclear industry. A very clear requirement is also in Section 36 of Regulation E-1 where it is stated that during the operation of the nuclear facility the

operating organisation shall permanently survey and analyse its safety status, taking into consideration the experience gained from other nuclear facilities as well as technological development.

Article 10: Priority to Safety

It is mentioned that independent safety review exist at Krsko. Which organisation, staffing and competence is used for independent safety review? Which types of issues are reviewed?
Independent safety review is covered through the following two groups: Independent Safety Engineering Group (ISEG) and Krsko Safety Committee (KSC). 1. ISEG is composed of at least five, dedicated, full-time engineers located on site. The ISEG is responsible for, but not limited to: a. examination of unit-operating characteristics, Slovenian Nuclear Safety Administration (SNSA) issuance's, industry advisories, License Event Reports, and other sources of unit design and operating experience information, including units of similar design, which may indicate areas for improving unit safety; b. detailed recommendations for revised procedures, equipment modifications, maintenance activities, operations activities, or other means of improving unit safety to the NEK Board of Directors and Director General. 2. The KSC is composed of 11 members including Chairman and Deputy Chairman of whom 6 members are not employees of Krsko NPP. The KSC is responsible for the review of: a. The safety evaluations for changes to procedures, equipment or systems; and proposed tests or experiments to verify that such actions did not constitute an unreviewed safety question or which involve an unreviewed safety question; b. Proposed changes to Technical Specifications, Safety Analysis Report (SAR) or the Operating License; c. Violations of codes, regulations, orders, Technical Specifications, license requirements or of internal procedures or instructions having nuclear safety significance; d. Significant operating abnormalities or deviations from normal and expected performance of unit equipment that affect nuclear safety; e. All Reportable Events; f. All recognised indications of an unanticipated deficiency in some aspect of design or operation of structures, systems, or components that could affect nuclear safety.

Article 11: Financial and Human Resources

What further measures are planned by the Slovenian Government to ensure the availability of financial resources for Krsko nuclear power plant normal operation and necessary safety upgrading?
In order to assure a stable financial and safety status for NPP Krško, Slovenian Government issued a Decree on the transformation of NPP Krsko (31.7.1998), which determines that the sole owner of the power plant is Slovenian Government. Croatian utility and Slovenian Utility have a status of joint investors with an initial capital. This decree has a temporary status and can be overruled by a bilateral agreement between Slovenia and Croatia, which is being negotiated. This act was necessary to ensure sufficient financial means for the operation and maintenance of the NPP and maintain a high safety level. This includes the recent refurbishment (replacement of steam generators and purchase of a full scope simulator) and upgrading with respective safety analysis and safety upgrading.

What are the professional qualification requirements for personnel for the different safety-relevant tasks?
Professional qualification requirements are addressed in regulatory documents as well as in NPP documents. Example of regulatory documents is Regulation E3 . These regulatory requirements clearly define qualification requirements for the personnel responsible for various tasks of safety significance. For the operators and shift engineers simulator training and re-training is prescribed. In addition, NPP has different documents (Technical Specifications, FSAR, and administrative procedures) where responsibilities and qualification requirements are defined. Qualification requirements for specific posts include requirements on: initial education, additional training, experience, and general requirements, such as knowledge of English.

Is there available expertise within Krsko to assess the safety of their facilities independently from the suppliers? Are there other organisations supporting Krsko for this task?
Krsko assess the safety of facilities independently from the suppliers with deterministic analysis (RELAP), probabilistic analysis (RISK SPECTRUM,ORAM) and severe accidents analysis(MAAP). There are also external subcontractors involved.

Which efforts are made to settle the ownership problems of Krsko and to secure the long term financial resources of the license holder?
In 1998, Government of Slovenia and Croatia appointed two expert groups to prepare a bilateral agreement on the status of NPP Krško. After exhausting discussions, both parties came to a common understanding of most issues. There are some pending and open items that still need to be solved, mainly concerning financial status of both parties, resulting from the period 1983-1997. The question of spent fuel and radioactive wastes will require some additional negotiations in order to come up with the first draft of the bilateral agreement that would be acceptable for both parties. It is necessary to emphasise that the transition period, while both parties are negotiating, does not and will not jeopardise the safety of the NNP. It is reasonable to expect that by the end of this year the bilateral agreement between Slovenia and Croatia could be signed.

It is mentioned that licenses for control room operators are valid for 4 years. What is required for renewal of the license?
Each year licensed operators shall complete annual simulator retraining and on-site classroom retraining sessions. News simulator retraining is seven working days long. Each working day is comprised of three hours of classroom preparation and four hours of simulator exercises. Last day in the week is examination day. Written exam lasts for approximately two hours and simulator performance evaluations approximately four to five hours. Currently, the simulator retraining is contracted by the NPP Krsko. On-site annual retraining is typically conducted two times per year, one cycle in springtime and one cycle in autumn. Major subjects covered are: domestic events, industry events, plant modifications, procedure changes (normal, abnormal, emergency, system), technical specification changes, new core cycle specifics and systems review. The candidates for license renewal attend one and a half to two week refresher course aimed to refresh knowledge of engineering fundamentals prior to taking examination. On-site and refresher training is conducted by NPP Krsko training department. In order to apply for license renewal examination, NPP Krsko has to

provide the following evidence to Slovenian Nuclear Safety Administration for each candidate:

- Completion of annual simulator retraining
- Completion of annual on-site retraining
- Physical and psychological fitness
- Safety at work examination
- Radiation protection examination

Special expert commission appointed by Slovenian Nuclear Safety Administration conduct license renewal examination. License renewal examination consists of written exam (limited to four hours) and oral examination. Successful completion of written exam (80% passage score) is a prerequisite to take oral examination. Oral examination by the before mentioned special commission is conducted during one working day and is aimed to examine broad spectrum of knowledge, including: engineering fundamentals, nuclear safety, plant systems, plant procedures, administrative controls, technical specifications, etc. The expert commission suggests license renewal period based on overall grade for each candidate. By Slovenian regulations, license validity spans from one to four years. Current practice, based on overall quality of candidates is to grant the license for four years. Licenses are granted by Slovenian Nuclear Safety Administration, based on suggestions from expert commission.

- and will represent higher confidence in safe operation of the plant.

Considering the above limitations SNSA issued in 1996 a Decree to NPP for installing a plant specific full scope simulator by the end of 1999.

Which training limitations have been experienced in the use of the foreign simulator?

Use of non-plant specific simulator is considered acceptable alternative (as it is the only alternative in current situation) until NPP Krsko will obtain full scope plant specific simulator. The following are major limitations of use of foreign simulators:

- Full scope simulator, identical (or very similar) to NPP Krsko main control room does not exist.
- Simulator exercises on non-specific simulator can be conducted only in limited scope in comparison to NPP Krsko operating procedures. This is especially true for normal operating procedures. NPP Krsko licensed personnel has no opportunity to train all operating procedures that are used in main control room.
- Skills obtained during practice on non-specific simulator can have potential negative effects on actions taken at NPP Krsko.
- Possibilities to adjust non-specific simulator according to NPP Krsko needs are very limited.
- Possibility to support emergency drills with the use of simulator does not exist.
- As no-specific simulator is used for initial training also, on-site preparation of the candidates for licensed operators lasts longer as they have to adapt to the plant after initial simulator training.
- Numerous tasks that would be trained on plant specific simulator are now trained on-the-job, thus representing potential negative effect on plant availability.

Licensing examination using plant specific simulator will be realistic.

Is the qualification level of operating personnel working outside the control room established by SNSA and does SNSA authorise/licence them?

If not, does SNSA by any means control qualification levels of operating staff working outside the control room?

SNSA does not license non-licensed personnel working outside the Main Control Room. Non-licensed operators are subject to periodic renewal of non-nuclear (conventional) licenses per Slovenian regulations (crane operators, boiler and pressure vessel operators, etc.). NPP annual personnel training plan is subject to review and approval by SNSA. News report on training is also subject to review and approval by SNSA. Many activities are subject to regular inspection by SNSA and some of those include verification of qualification for specific tasks.

The role of maintenance personnel is important to the safe operation of NPPs. Please explain the content of maintenance personnel training and the requirement for individual qualification? What kind of maintenance training facilities do the Slovenian NPP operator (licensee) have?
A maintenance personnel training is specific for each maintenance discipline and is devided into two parts. First part consists of the basic training in nuclear technology in domestic Training Centre and maintenance training at NSSS vendor and at the equipment suppliers. Second part is on-the-job training in the NPP Krsko. NPP Krsko does not have specific maintenance training facility. Mock-up is available for SG maintenance activities. Training is organised using available maintenance shops space or classrooms. Training for a maintenance personnel on larger equipment is typically organised at equipment vendor locations, for smaller equipment, training is organised at NPP location, using available shop space or classroom. I&C laboratory is also used for training as necessary. NPP Krsko is planning to organise dedicated maintenance training facilities inside existing auxiliary buildings.

Article 12: Human Factors

Will a plant-specific full-scope simulator be available for Krsko nuclear power plant operators according to the schedule?
Yes, simulator building is under construction, at the supplier the acceptance tests of the simulator are in progress.

Are there working groups installed in the NPPs or within the operating organisation to deal with Human Factor aspects?
Yes, at NPP Krsko the Independent Safety Engineering Group (ISEG) deals with Human Factor aspects in accordance with Operating Experience Assessment Programme. ISEG is responsible for maintaining surveillance of unit activities to provide independent verification that these activities are performed correctly and that human errors are reduced as much as practical.

Man-machine interface improvement is basically achieved according to US standards, supplemented by recent studies such as PSA and experience feedback. The level of automation is not indicated : is there a rule in this field?
There is no specific rule in this field. However NPP Krsko, in accordance with USA standards and experience, developed the set of plant specific procedures for manageable and automated review of man-machine interface including Root Cause Analysis, Post-trip Review, Operating Experience Assessment Programme or/and Deviation Reporting. From the PRA (on power) point of view, NPP Krsko applied THERP Human Reliability Analysis (Technique for Human Error Rate Prediction) that also takes into account the man-machine interface.

Shutdown situations have particular features concerning human factors : are there specific measures (procedures) relating to shutdown situations?
Using the EPRI-s ORAM method the Shutdown PSA was performed. Based on that procedures were developed for refuelling and maintenance activities planning aiming at better controlling the risk and at avoiding the high-risk configurations. Recently, plant introduced the computer code based on ORAM approach which more effectively supports the risk management in shutdown states.

What are the criteria applied by SNSA to assess the safety culture level of licensee?
There are no established criteria in this field. The suggestion and recommendation of IAEA missions in this field are reasonably implemented and /or followed. IAEA documents in this field are used as a basis for safety culture implementation and evaluations.

Are there in Slovenia any R & D activities in the field of human factors related to nuclear safety? If so, what have been the main findings?
There is only limited financial support for R & D activities in the field of human factors related to nuclear safety. Slovenian institutes have participated in IAEA programme (IAEA-J4-RC589) with the reports on: • Methods for analysis of human impact on systems performance and safety • Mathematical modelling of system performance in relation with selected human performances An analysis of working places in the NPP Krsko was performed. As a result selection and follow-up criteria for important jobs were defined for general adaptation and accomodation, perception, reaction, personal integrity and stress resistance. A research on actual availability, potential availability and performance of operators in the control room of the NPP Krsko resulted in the preparation of curves of availability and performance for day and night shifs. Special mathematical model connecting human performance with the reliability was developed. On the basis of the results organisational changes were suggested. The finding was also that the work complexity in the morning shift should be decreased.

Recently special QA procedure for assuring long-term human availability and fitness for duty for permanent contractor performing construction activities was validated. Effectiveness of the procedure was evaluated by the results of periodical medical and psychological tests and field measurements and by estimation of worker performance.

Which major modifications have been made to the man-machine interface as compared to the original design?

The most important implemented modification directly related to the man-machine interface (MMI) is installation of Process Information System (PIS). In addition to a PIS project a lot of other implemented modifications affected consequently original MMI (see bellow).

Process Information System (PIS) Modification

The largest modification affecting MMI in the Main Control Room (MCR) was installation of PIS which incorporate twelve desktop monitors and four Main Control Boards (MCB) panel mount monitors, screen MMI for monitoring of Process variables, application programmes (Nuclear, Secondary etc.), System parameters trends with history, status of equipment etc. PIS System is using full graphic colour images, user friendly menu and soft-key driven display hierarchy, consistent colouring scheme, dynamic symbols driven by process signals, capabilities to exchange alphanumerical input/output messages with operators, functional - single touch action keyboards, etc.).

During the preparation of this modification all related requirements issued by US NRC (see bellow) were respected.

Modifications or activities which have consequently changed also man-machine interface in NPP Krsko were:

- Review and correction of labelling or unambiguous identification of all components instruments and controls which are available in the MCR and in the field.
- Annunciators were modified to implement annunciator free environment.
- Some local control panels were modified with reference to the signal and controls grouping, labelling, and panel colouring scheme.
- Upgrade of MCR environment factor engineering and environment (furniture, carpeting, colouring scheme for the panels and cabinets, air conditioning, and lighting).
- Most trend recorders were changed with the upgraded, which incorporate digital display.
- During the last years several new additional Radiation Monitoring Systems, using new digital display, were installed in MCB.

During the Outage 1999 installation of Reactor Vessel Level Instrumentation and Inadequate Core Cooling Monitoring System will be implemented. Old Subcooling monitor will be removed and replaced with two (two trains) new analogue indications. In addition indications for Rx vessel level and Tauc high Thermocouple/per train will be added on the MCB. Original incore cabinet will be removed by new designed by Westinghouse (WDPF) equipped with two WESE station for monitoring of Thermocouples and other parameters.

US NRC documents which affected MMI upgrade related modifications in NPP Krsko were:

- NRC NUREG-737, Supl. 1, Clarifications of TMI Action Plan Requirements
- NRC NUREG-700, Guidelines for Control Room Design Reviews
- NRC NUREG-835, Human factors Acceptance Criteria for SPDS
- US RG 1.47, Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems

Does a plant policy on safety culture exist as a written document?

If yes, are managers and workers familiar with it?

Yes, plant policy on safety culture is referenced in a number of top tier documents with a clear statement of NPP Krsko policy on safety, production and responsibilities. This policy is defined in various documents like: Quality Assurance Plan, Plant Management Manual, NPP Krsko Policies and Goals, Company General Employee Training Handbook,

Operating Experience Assessment Programme etc. Within these documents, clear statements are made about the policy on safety culture and developed into goals and objectives for each division within NPP Krsko.

Article 13: Quality Assurance

What is currently the maximum permissible time interval between the audits for the same functional area?
The maximum permissible time interval is 24 months according to the NPP Krsko internal procedure; specific areas have more stringent time interval in accordance with Reg. Guide 1.33.

Does the quality assurance programme for the Krsko NPP also consider ageing phenomena?
The QA Programme is written in conformance with 10CFR50 App. B. The current QA programme is applicable for the life of the plant including decommissioning and is not directly addressing ageing phenomena. The programme however calls for regular internal auditing of the ISI programme. ISI programme was prepared on the basis of ASME Sec. XI (1986).

Is there a QA programme applied by SNSA to regulatory activities?
SNSA has no overall QA-programme for the regulatory work. QA procedures are being developed with lower priority although the need for the programme has been recognised. There are in use Administrative Procedures for the functioning of the Administration, Inspection Manual Procedures and Emergency Plan Procedures. Help is received in the preparation of the procedures from the EU through the RAMG (Regulatory Assistance Management Group) Programme. SNSA is subject of auditing for the regulatory work by the Ministry of Justice and by the Ministry of Finance for the financial policy. Besides, SNSA work is reviewed by different missions of the IAEA and EU. IRRT mission is planned for the end of 1999.

How does the SNSA control the efficiency of the QA-programme at Krsko?
In accordance with the yearly inspection programme SNSA performs inspections (audits) of the efficiency of Krsko QA Programme three times per year. Findings of the inspection are presented and the defficiencies are requested to be corrected by the NPP Krsko.

How are internal audits planned and performed at Krsko?
In accordance with audit programme procedures which comply to the requirements of ANSI N45.2 and NQA-1. The internal audits programme is defined in an internal procedure. The QAP procedures define the performance of audits.

Article 14: Assessment and Verification of Safety

What is the position of SNSA on requiring a Periodic Safety Review comparable to those periodic review processes mandatory in a number of countries in Europe?
The question whether to insert into the new legislation (which is under preparation) a requirement on Periodic Safety Reviews is still under consideration. If a positive decision will be taken the required scope of the PSR programme would follow the IAEA guides and the International experience. (See also the response to a French question on Article 6 and to a Italian question on Article 7).

Which position do Technical Support Organisations (TSOs) have in the assessment and verification process? What is the qualification assessment process for TSOs?
Based on the 1980 Act the organisations were appointed for giving support to the regulatory body in different fields related to nuclear safety. They are also responsible for assessment and verification of the safety of nuclear facilities. SNSA has developed criteria for qualification and is also performing QA audits in these organisations with the frequency of two years.

Please clarify the following two statements on page 50 of the National Report: Due to that, there is no comprehensive verification that all the aspects are completely, regularly and adequately addressed. As a conclusion, Slovenian regulations and practices are in compliance with the obligations of Article 14?
The conclusion that there is no comprehensive verification that all important safety aspects are completely, regularly and adequately addressed refers to the legislation. Additionally to the NPP Krsko, SNSA has a complete regulatory control over all the safety issues and their applicability and implementation at the plant. Based on this Slovenia does comply with the provissions of the Article 14. (See also the response to a French question on Article 6 and to a Italian question on Article 7).

PSA study initiated ..... quite extensive plant improvements .... Are any safety improvement measures already considered in the PSA or reflects the result of CDF = 2.7E-4/ry (see page 11) the situation without the improvement measures?
The overall CDF of 2.7E-4/ry considered the overall CD frequency for the on-power internal/external initiators and average CDF for the shutdown modes of operation for the NPP Krsko. The given result reflects the initial state of the design/plant operation practice of NPP Krsko, e.g. without the implemented improvement measures. The modifications and improvements in the plant design have mostly resulted from the PSA Level 1/Level 2 study of NPP Krsko, and as such are planned/applied as the backfitt action to the original design after the study has been done. As the example, the following modifications can be mentioned: • Separation fixes of the air supply to certain AOVs; • 125V DC power supply extended capacity (from 2hr to 4 hr); • IA control air tanks backup modification for important control AOVs; • AMSAC system modification; • SW trains raw water filters modification; • Various small fixes related to the seismic based events (fixations, equipment supports, equipment/components interaction reduction, etc.); • FP fire area modifications with rerouting, fire barriers and FP system protection annunciation and actuation modifications; • Rx "Dry cavity" to "Wet cavity" design modification.

All these modifications are already performed, or are in the process of the close schedule implementation. The modifications are resulting in the increase of the safety of the operation of the NPP Krsko, through the usage of the principles of the better separation, diversity, reliability and availability of the components/equipment and the system at whole. With these modifications the overall CDF decreases accordingly.

Once implemented, which will be the scope of the PSR (Periodic Safety Review) programme in Krsko NPP and which will be the duties of each involved party ?

PSR is not yet required and scope of PSR and responsibilities of each involved party has not been defined yet.

(See also the response to a French question on Article 6 and to a Italian question on Article 7).

The report states that : The licensing process and licensing requirements are defined in the national regulation (the 1984 Act and Regulations E-1 and E-2) covering the aspects of siting, design, construction and operation. The missing requirements are covered by the regulation from the countries of technology origin. What are these missing requirements ? Are they identified in an inventory document ?

Slovenian legislation is complete and is covering most of the requirements in the nuclear energy and safety area. Slovenia however has not developed specific standards, technical criteria and quality norms for the design and construction of nuclear facilities. In the case of Krsko NPP US codes and standards were applied directly as per Section 37 para 2 and 3 of the 1984 Act which allows in such case that technical criteria or quality norms, rules established by international or foreign technical regulations or international and foreign standards may be applied.

Verification

Since the Periodic Safety Review is not yet adopted and despite many analyses and re-assessments performed, the report underlines that a systematic approach was not followed. Consequently, there is no comprehensive verification that all important safety aspects are completely, regularly and adequately addressed.

Nevertheless the report concludes that Slovenian regulations and practices are in compliance with the obligations of Article 14. Could Slovenia comment ?

The conclusion that there is no comprehensive verification that all important safety aspects are completely, regularly and adequately addressed refers to the legislation. Additionally to the NPP Krsko, SNSA has a complete regulatory control over all the safety issues and their applicability and implementation at the plant. Based on activities and programmes for verification of safety as described in the report Slovenia does comply with obligations of Article 14.

Does Krsko NPP intend to adopt the Periodic Safety Review in a near future ? If not, how Krsko NPP will proceed to identify those of the safety aspects which remain to be addressed ? Has a methodology been established for this purpose ?

Periodic safety review is scheduled to be implemented in the NPP Krsko after the steam generator replacement project is completed.

Control of modifications (this paragraph is included in Article 7)

According to the Slovenian legislation, nuclear facilities are obliged to notify modifications and changes of FSAR to SNSA. The report mentions that the legislation does not define the criteria and procedures for each type of modification. What are the modifications that require an approval by the SNSA before implementation?

Change of plant Technical Specifications, unreviewed safety question (based on safety evaluation), changes in organisation and changes in Plant Emergency Preparedness Programme, require an approval of SNSA. Additionally, SNSA can require licensing procedure for any other modification, if its assessment show that there is a safety impact. Namely NPP sends all planned modifications for screening to SNSA. For changes of the FSAR three categories are recognised in the legislation similar to 10CFR50.59.

Are improvements performed by other countries in similar designs being assessed in a systematic way by SNSA or Krsko,

to consider the implementation in Krsko NPP?
Yes, one of the responsibilities of the Independent Safety Engineering Group (ISEG) in NPP Krsko is to follow industry experience according to the Operating Experience Assessment Programme. Industry event reports from various sources (like: United States Nuclear Regulatory Commission (NRC), World Association of Nuclear Operators (WANO), Institute of Nuclear Power Operation (INPO), Westinghouse Owner Group (WOG), vendors, units of similar design, etc.) are screened for applicability and significance for the plant. The Krsko Operating Committee further approves evaluations with proposed corrective actions. Implementation of the corrective actions is further followed until completion. SNSA is also assessing industry and regulatory experience from other countries, through the IAEA or through direct contacts. According to the results of those assessments SNSA can propose or request solutions for improvements in nuclear safety at the NPP Krsko. A sistematic screening is also performed for USNRC Generic Letters.

Is the risk information being used to ensure adequacy of the NPP maintenance programmes?
The risk information is being used in NPP Krsko in the process of scheduling the on-line maintenance. The information relates to all relevant aspects of risk impact, i.e. instantaneous, temporary and cumulative impacts. Risk information is also used for scheduling the maintenance performed during the outage periods.

Is there a systematic programme, agreed with the SNSA, for the management of ageing and plant life extension in Krsko NPP?
There is no systematic programme agreed with the SNSA for management of ageing and plant life extension in Krsko NPP. However Krsko is participating in the Westinghouse Owner?s Group Plant Life Extension and License Renewal Programmes which will result in such a programme.

It is not clear from the Report, what are the documents that establish/specify the periodicity of NPP safety assessment.
See response to the next question.

It is mentioned that Periodic Safety Review is not adopted yet. Which are the plans for introducing PSR?
The question whether to insert into the new legislation (which is under preparation) a requirement on Periodic Safety Reviews is still under consideration. If a positive decision will be taken the required scope of the PSR programme would follow the IAEA guides and the International experience.

Is there a full time safety review group which reports directly to the plant manager and/or owner of the NPP Krsko?
Yes, the Independent Safety Engineering Group (ISEG) is composed of at least five, dedicated, full-time engineers located on site. Monthly report of ISEG activities including recommendations for the improvement of plant safety and reliability is prepared and distributed each calendar month to the NEK Board of Directors (owner representatives) and NPP Krsko Director General.

Article 15: Radiation Protection

1. What are the average occupational doses and the maximum exposure values for the personnel in the Krsko Nuclear Power Plant and what are the collective doses for the nuclear power plant or per MWh produced? 2. What were actual release values of radioactive effluents in terms of absolute values or relative to prescribed limits? What was the trend over the past years?
See Attachment 1.

What is the annual equivalent dose limit for a member of the public considering only plant effluents?
News effective equivalent dose limit due to plant effluents: 50 microSv.

Dose limits (i) The classification system of workers for radiation protection purposes and related monitoring requirements is not specified. (ii) Are so called specially authorised exposures provided for in cases where operations cannot be carried out under established dose limits? If so, who is responsible for authorisation?
i) In accordance with 15th article of Regulation Z-6 workers are classified into two categories, namely categories A and B. In category A the expected personal annual dose is likely to exceed 3/10 of annual dose limit, in category B the quoted level is unlikely to be exceeded. In practice, also category C was introduced for workers with expected levels of annual exposure of less than 1/10 of the dose limit. News limits are still based on ICPR 26 (50 mSv/y). The same regulation defines also personal monitoring requirements of the occupationally exposed workers and monitoring requirements of the working places. Individual dosimetry control covers all categories of workers: TLD is used for external radiation, the results of measurements of air concentrations and surface contamination at workplaces and whole body measurements are used in the case of internal exposure. Neutron dosimetry is applied where appropriate. ii) Planned special exposures may be permitted for a worker, provided that the doses received do not exceed twice the relevant annual dose limit in any single event, and five times this limit in a lifetime. Planned special exposures shall not be permitted for women of reproductive capacity. These exposures may be approved by the responsible persons in the licensee organisation (for example by Technical Director and Radiological Protection Superintendent in NPP Krsko as defined by internal procedure). SNSA and Health Inspectorate are notified and perform an inspection of workers exposures for a determined period.

Could Slovenia give additional information regarding: • individual doses : mean value, statistical distribution (histograms), • collective doses, • release of radionuclides in the environment and radiological impact to the public, • evolution over the past years for these three points.
See Attachment 1.

The information on the regulatory activities regarding radiation protection is very limited. Details on the surveillance and control programmes being performed by SNSA or the Health Inspectorate to ensure the adequacy of NPP practices are needed.
SNSA issues yearly decrees on radiological and meteorological monitoring programmes in the vicinity of the NPP. The SNSA and the Health Inspectorate are the regulatory bodies which carry out inspections through weekly and ad hoc

inspections of radiation protection:

Surveillance programmes:

- environmental radioactivity monitoring, consisting of air, surface and drinking waters, soil, sediments, external radiation, agriculture products (foodstuffs, fodder) control of specific radioactivity, in the nearby environment of NPP and in the country
- control of liquid and gaseous emissions from the plant
- automatic network system of the process radiological monitors, controlling the operating parameters
- automatic network for continuous gamma-dose rate measurements, located circularly around the site
- maimtenance of dosimetry data base

Control (inspection) programmes:

- inspection of general radiation protection status at workplaces
- inspection of ALARA principle in performing the radiation protection tasks
- inspection of dosimetry data
- inspection of activities of the NPP radiation protection services regarding procedures, methods of work used, training programmes, specific methods used on the site,
- inspection of radwaste treatment and handling
- inspection of preparedness on radiation. protection dept. in case of emergency
- measurements of radiation at workplaces, determination of classified working areas, delineation and labelling of areas
- inspection of a preparing for handling and shipment of radioactive components
- inspection of spent fuel

Article 16: Emergency Preparedness

What measures have been taken to ensure efficient communication lines between all institutions related to emergency preparedness?
For the communications between the institutions related to the emergency preparedness the following diverse and independent communication means are provided: • public telephone and facsimile lines, • radio system between the civil protection units, • Govermental radio system, • e-mail communication, • teletype machine (telex), • mobile telephones. In specific cases the communication is via specific lines dedicated to the communication in railway system or to the power distribution system. There are the following computer network systems: • CROSS: for the collection of gamma dose rate measurements from the probes located on the Slovenian territory, • EIS: to provide meteorological data in the Krsko area and radiation measurements from the power plant radiation monitors, • ERDS: to provide the on line readings of the specific power plant parameters during the accident.

When will the remaining non-conformances identified by the RS Administration for Rescue and Disaster Relief regarding emergency preparedness at the Krsko nuclear power plant be eliminated?
The question should be further clarified. In the report related to the Nuclear Safety Convention, the non-conformances are not mentioned. If the question is related to the Report on Nuclear and Radiation Safety in 1997, it should be added, that the non-conformances which were mentioned to be corrected after the inspection of the Inspectorate for the Protection against Natural and Other Disasters, were related to the organisational aspects and not to the nuclear safety.

In assessing the radiological release due to a nuclear accident, have "worst case scenario" assumptions been applied?
Yes. The assessment of radiological release comprises the core melt with the catastrophic failure of the containment in the stable weather conditions.

What kind of on-site emergency exercises is performed at the Krsko NPP? What is the frequency of these exercises?
NPP Krsko performs three types of emergency exercises: • Tabletop exercises once per 2 years; • Onsite integrated exercises once per 2 years; • Onsite - offsite full-scale exercises once per 5 to 6 years. Additionally NPP Krsko conducts the following partial emergency drills on annual basis: • Emergency response organisation and facility activation;

- Evacuation and accountability;
- Radiation monitoring and dose assessment (3 to 5 times per year);
- Medical response;
- Communications;

Fire protection (monthly).

What is the estimated evacuation time of the population inside the 3 Km radius around the Krsko plant?

The evacuation time for the population inside the 3-km radius was estimated in the study "Evacuation Time Estimates for the Plume Exposure Pathway in the Emergency Planning Zone of the Krsko NPP". The result varies from 160 min for fair weather to 200 min for the adverse weather.

What are the means used for alarming the population in the situation of Site Emergency and General Emergency?

In the situation of the Site Emergency or General Emergency the sirens are used for alarming the population. The instructions and notifications are given through the local and national media.

How is Iodine prophylactics applied? What are the criteria for distribution of Iodine tablets? Who keeps the tablets and who distribute them?

The criterion for the distribution of KI tablets is in accordance with the latest IAEA recommendations (IAEA-SS 109, 1994) - the avertable dose 100 mGy to the thyroid in two days. The tablets are kept in three places: in the NPP for the NPP personnel and in the warehouses of the two civil protection headquarters of the nearby municipal communitie. The non-professional members of the civil protection perform distribution of the tablets and a plan for distribution of KI tablets had been devised.

At which level of the INES scale do the events taken into consideration for the emergency planning correspond? What releases in terms of I-131 equivalent do those events involve?

INES scale was designed only for informing the general public about the safety relevance of the events and is not intended for the emergency planning. The NPP Krsko adopted the NUREG-0654 classification methodology. Assumed I-131 equivalent releases asumed during emergency situation are:

- 0 Bq for anusual event clasification,
- 3.7 x 1011 Bq for alert,
- less than 3.7 x 1013 Bq for site emergency, and
- more than 3.7 x 1013 Bq for general emergency.

Which are the reference dose levels adopted for the implementation of the various countermeasures?

Intervention levels and countermeasures follow IAEA SS 109, 1994.

Which are the modes established to inform the public during the emergency?

During the emergency the public is informed through the local and the state public media - radio and TV.

16.1. On-site and off-site emergency plans

The report indicates that evacuation is planned if the projected dose in one hour is higher than 10mSv. The international recommendation requires evacuation if the projected dose is between 100 and 500 mSv. Could Slovenia comment on its approach?

During General Emergency evacuation is recommended in the radius of 3 km if the projected whole body dose at 500 m (based on actual measured release) is 10 mSv in 1 hour or 50 mSv in one hour to thyroid. In general new intervention criteria used in Slovenia follow the recommendations of the IAEA SS-109 (Intervention Criteria in a Nuclear or Radiation

Emergency).

Are there computerised support systems to understand the status of the installation, to predict accident progression and the doses around the plant?

There are computerised support systems to understand the status of the installation such as:

- critical functions display monitor,
- software for real time core activity calculation, real time evaluation of the in-containment release, and for dose projection around the plant based on some main indicators of the plant status,
- ERDS available to SNSA,
- on-line gamma monitoring network in the vicinity of the plant available to the NPP and SNSA,
- on-line aerosol monitoring stations (Ljubljana, NPP Krsko site - operational this year).

16.2. Information

Is the population living in the vicinity of the plant informed of the emergency planning measures?

Yes.

Due to the proximity of Krsko NPP to the Croatian border, have specific arrangements being established to be applied during radiation emergencies?

The zone of long term countermeasures covers also a part of Croatia. In case of nuclear emergency Croatia would be notified as it is requested by the Convention on Early Notification of a Nuclear Accident and also a bilateral agreement between Croatia and Slovenia on the early exchange of information in case of a nuclear or radiation emergency, and bilateral agreement on protection against natural and other disasters. Based on the agreement on exchange of information the two radiation warning systems of both countries shall be connected by the end of 2001.

How is the joint ownership and the closeness to Croatia accounted for in emergency planning? How will information be passed on to Croatia in an emergency situation? How does Croatia participate in exercises?

The above mentioned bilateral agreements form a sound basis to achieve prompt notification of the Croatian authorities. For the time being there has not been a joint international exercise with Croatia yet though the experts from the Croatian regulatory body participated in emergency drills at SNSA. Through the participation in the Nuclear Safety Expert Commission the Croatian experts are also familiar with the new National Emergency Plan. The co-operation between Croatia and Slovenia in the emergency preparedness shall be further enhanced. So far the close proximity of the Croatian border has not been enough accounted for in the emergency planning.

Please provide an overview of the on-site emergency response organisation and the accident management principles at Krsko. Who decides on emergency classification and alarming? Which training and exercises are carried out annually?

The first level of the emergency or initial response in case of the higher level of the emergency is managed by the on-shift emergency response organisation. Immediate responses also assure off-site support organisations - for medical and fire emergency handling. The shift supervisor assumes the function of the emergency director.

Emergency director is responsible for the classification of the emergency, for the assessment of the radiological consequences of the accident and recommendation of the protective actions for the public and notifications of the off-site authorities about the status of the emergency.

The full-scope on-site emergency response organisation is activated in case of the second or higher level of the emergency. The emergency response organisation is composed of the main control room, technical support centre (TSC) and operations support centre (OSC) emergency response organisation.

The TSC is the on-site emergency response facility organised for the overall managing and co-ordination NPP Krsko's emergency response. When the TSC is activated the shift supervisor is relieved from the function of the emergency

director and the technical director or his alternate assumes the function of the emergency director. He has the responsibility and authority for the overall NPP Krsko emergency management. He is supported by the radiation protection co-ordinator, operations support co-ordinator, engineering support co-ordinator, maintenance co-ordinators, dose assessment co-ordinator, security co-ordinator, administration and logistic support co-ordinator, chemistry co-ordinator and core damage assessment co-ordinator. They are also located in TSC. The shift supervisor in main control room is directly responsible to the emergency director.

The OSC is the on-site emergency response facility. From the OSC the emergency response teams are dispatched. The following emergency response teams are located in the OSC: radiation protection team, maintenance teams, chemistry team, first aid team, fire protection team and reserve team of the operators. The OSC co-ordinator co-ordinates the OSC. He is responsible to the emergency director.

Additional to the radiological emergency response plan (RERP) and RERP implementing procedures (EIPs) the abnormal operating procedures (AOPs), emergency operating procedures (EOPs), severe accident management guidelines (SAMGs), radiation protection and other site specific procedures are developed for the on-site emergency management.

Now, the NPP Krsko is establishing the Off-site emergency operational facility (EOF) as the part of the on-site emergency response organisation. The EOF will be activated at the third or the fourth level of the emergency.

The following type of the training and exercises are carried out annually for the members of the NPP Krsko's emergency response organisation and off-site support organisations:

- Initial emergency preparedness training for the new members of the emergency response organisation;
- Re-qualification emergency preparedness training which consists of the general and special emergency preparedness training like a dose assessment, emergency classification, notifications, use of the respiratory protection etc.;
- the emergency response organisation and facilities activation drill (once per year);
- the evacuation and accountability drill (once per year);
- the radiation monitoring and dose assessment drill (3 to 5 times per year);
- the medical response drill (once per year);
- the fire protection drill (once per month);
- the tabletop exercises (once per 2 years);
- the onsite integrated exercises (once per 2 years);
- the onsite-offsite full-scale exercises (once per 5 to 6 years).

Who and when will inform Croatian authority in case of an emergency in NPP Krsko?

Is there certain notification form with important information regarding emergency that would be forwarded to the authorities of neighbouring countries?

The Croatian authorities will be promptly informed in accordance with bilateral agreement between Croatia and Slovenia on the early exchange of information in case of a nuclear or radiation emergency and with the Convention on Early Notification in case of a Nuclear or Radiation Emergency. Initial notification and susequent additional information will be received from the SNSA and also through the IAEA. The form will be as it is foreseen for the IAEA Convention i.e. form on Notification of the Accident?.

Bilateral agreements are also in force with Hungary and Austria. All the bilateral agreements are based on the IAEA Convention and on the EU Council Decision of 1987.

Article 17: Siting

Have state-of-the-art seismic analyses been performed for the Krsko nuclear power plant site (e.g. probabilistic seismic hazard analyses, seismic margin analyses, seismic PSA)? Did these analyses result in any upgrading? If such analyses are planned, what is the schedule for their completion?
State of the art seismic analyses have been performed in the scope of Individual plant Examination for external Events. In this scope site specific Seismic Hazard Analysis as well as Seismic PSA (level 1 and level 2) were performed. Analyses were completed in 1995. Team of technical experts through IAEA Technical Assistance programme has also reviewed them. In the analyses identified weak points have been upgraded (for example: MCR ceiling was replaced, some of the electrical distribution panels were additionally welded to the in concrete imbedded steel structure, component cooling surge tank support was strenghtened, supports of several valves installed on the pipes penetrating the containment were modified, analysis of relay chattering was performed and appropriate procedure for corrective actions was established.

How does the seismic hazard curve used in the Krsko probabilistic safety assessment compare with the seismic hazard information developed by the Geophysical Survey of Slovenia?
In fact seismic hazard curves used in NPP Krsko PSA analysis have been developed by domestic organisations including Geophysical Survey of Slovenia. Work was co-ordinated by University of Ljubljana Department of Civil Engineering Institute for Structural and Earthquake Engineering.

What seismic studies related to the Krsko nuclear power plant (including those performed with PHARE funding) have been carried out since the International Commission of Independent Safety Analysis (ICISA) report was issued in 1993, and to what extent was the ICISA seismic evaluation programme proposal included in these studies? What are the results of these studies?
Before ICISA was formed, SNSA issued in early 1991 a Decree to the NPP Krsko requesting to perform PSA level 1 and 2 for internal and external events (including seismic). All recommendations from 1993 ICISA report were addressed in the seismic PSA study. After completion of PSHA analysis an extensive geological, seismological and geophysical programme have been proposed by SNSA and in first phase carried in period 1993 - 1996. International expert panel (through IAEA Technical Assistance Programme) has externally reviewed results. It was recommended that additional geophysical investigation should be conducted in Krsko valley. These additional investigations covering 40 km of seismic reflection profiles and sponsored by PHARE Programme are in progress and are scheduled to be completed next year. By this seismic issue will be closed.

17.1. External events taken into account Could Slovenia give some information on the methodology used to define the level of the external events taken into account in the design?
The plant is designed regarding the effects of natural phenomena in accordance with Criterion 2 of Appendix A to 10 CFR 50 General Design Criteria for Nuclear Power Plants. External flood: Maximum probability method has been applied to define 10.000 year flood level Seismic design: Regarding seismic design NPP Krsko is designed for 0.3g SSE (Safe Shutdown Earthquake) and 0.15 OBE (Operational Basis Earthquake). Its definition included maximum acceleration value, response spectrum and the time histories of acceleration/maximum acceleration value. For the design spectrum, the one recommended by the USAEC Regulatory Guide 1.60 was adopted. For the time histories of acceleration, artificial time histories corresponding to the design spectrum were used. The above values have been determined based on site geological and seismological investigation. Wind loadings: The fastest kilometre speed applied was 140 km/h at 10.0 meters above grade.

Missile protection: Objectives governing the design input were:

- The integrity of the Containment System must be maintained.
- The capacity for safe shutdown of the reactor and maintenance of core cooling capability must be ensured.
- A missile accident which is not caused by a loss-of-coolant accident does not initiate a loss-of-coolant accident.

17.2. Radiological impact of the plant

Could Slovenia indicate if the regulations prescribe dose limits for design basis accidents?

Dose limits ffor design basis accidents applicable for NPP Krsko are limits from 10CFR100 250 mSv total radiation dose and 3 Sv to the thyroid within two hours at the border of the exclusion area - 500 m for NPP Krsko. These limits were approved in the FSAR on the basis of the recognition of US regulations if domestic do not exist.

17.3. Siting revaluation

Under Article 14, the report indicates that the analysis of the impact of site seismic activity on nuclear safety is ongoing. Could Slovenia give more information on this safety review?

NPP Krsko performed seismic PSA analysis in the scope of IPEEE (Individual Plant examination for External Events). During IAEA technical review of the NPP Krsko PSA study it was recommended that additional geophysical and geological investigation of the vicinity of NPP Krsko should be conducted to reduce uncertainty related to seismic inputs.

(See also answer to Austrian question on Article 17).

Is there a surveillance programme for assessing the validity of site parameters like land use and population, meteorological, hydro-geological or seismic information?

Site related factors described in FSAR i.e. (meteorology, hydrology, seismology, population density, nearby industrial facilities) are followed by different monitoring programmes:

- Meteorological monitoring
- Seismological monitoring
- Hydrological monitoring

Population density, nearby industrial facilities and transportation routs and activities are inputs for the Emergency plaan update.

Exclusion Area of 500 m and Low Population Zone of 1500 m are subject to restrictions in land use, prescribed in the Site Permit.

Please describe the programme for re-evaluating site-related factors and which are the rules and criteria applied?

Generally, site-related factors used as the input to the original design are not allowed to change in adverse direction.

Site related factors described in FSAR i.e. (meteorology, hydrology, seismology, population density, nearby industrial facilities) are followed by:

- Different monitoring programmes,
- Plant and regulatory body review and approval of changes in population density and in industrial facilities.

Site related factors were also re-evaluated as a part of external events PSA study.

Article 18: Design and Construction

What kind of on-site accident management measures are under consideration or already in place to prevent severe accidents or mitigate their consequences (e.g. containment venting, bleed and feed, additional emergency power supply)?
Regarding the measures taken to handle severe accidents, NPP Krsko is in process of implementing plant specific Severe Accident Management Guidelines (SAMG) prepared based on Westinghouse Owners Group generic documents. Procedures are prepared for Main Control Room operators (interface documents between Emergency Operating Procedures and SAMG) and Technical Support Centre acting as a central point for handling the emergency conditions including severe accidents. Symptom oriented Emergency Operating Procedures were introduced in NPP Krsko in 1988. They already included feed-and-bleed recovery procedure. In the past several hardware improvements were implemented: • in respect to ATWS Rule AMSAC system was installed • Station Blackout Rule resulted in several changes (upgrade of both trains of batteries for higher capacity, installation of compressed air tanks for the supply of air to PORVs on the steam generators • since 1991 additional 400 V, 250 kW diesel generator is available on the site for emergency power supply In response to the results of the Krsko PSA study several modifications were performed: • change of dry reactor cavity design to wet (conceptual design completed, installation in two years) • implementation of modifications in the fire protection systems (additional smoke detectors, additional emergency lighting, additional sprinklers, improved plant communication, replacement of fire doors, modification of local shut down panels by isolation of critical circuits from the control room circuits, 3-hour cable wrapping for engineered safeguards equipment) TMI related items include installation of Post Accident Sampling System, Reactor Vessel Head Vent, Inadequate Core Cooling Monitoring, Reactor Vessel Level Instrumentation and High Range Containment Monitoring.

The report only indicates that US codes and standards were applied. Although the basic principles (defence-in-depth, barriers) are in compliance with the obligations under Article 18, it is difficult to appreciate this compliance without additional details. In particular, what are the evolutions since the initial design (severe accidents management, allowance for human factors, lessons learned from experience feedback)?
Since initial design numerous safety improvements based on NPP Krsko specific experience feedback have been implemented (modifications to the systems - IA,...) as well as numerous improvements based on US regulation requirements and on the plant specific severe accidents analysis performed in the scope of PSA study: action related to post TMI programme - NUREG 737, ATWS regulation 10CFR50.62- AMSAC system was added, SBO rule - 10CFR50.63 - improvements in DC supply. (See also answer to the above question)

Is there a policy by SNSA for addressing severe accident response by Krsko?
SNSA priorities in nuclear safety for the NPP Krsko in the past 10 years mainly addressed operational safety items: completion of open TMI issues, Fire Hazard Analysis, Pressure Vessel Embritlement Study, new StandardTechnical Specifications, Station Blackout Study, revision of the Site Emergency Plan, etc. SNSA has formally requested in 1991 the initiation of the study of severe accidents in NPP Krsko in connection with the PSA Study.

Action plan addressing severe accident response has been drafted from the NPP Krsko PSA study which included several sensitivity calculations (dry versus wet reactor cavity, containment filtered venting, etc). SNSA is supporting all the activities aimed at increasing the plant preparedness to cope with severe accidents.

Which are the licensing requirements for proven design and environmental qualification and which steps are taken e.g. in plant modifications to meet these requirements?

One of the main licensing requirements is that equipment or modification should be of the proven design already successfully used and licensed in other NPPs.

Modification process in NPP Krsko is covered by set of Engineering Procedures giving an uniform approach how to prepare Design Change Documentation (see the list at the end of this Section). During the preparation of Design Change Documentation each Responsible Engineer (RE) should prepare a design input document, which defines the design inputs, bases and other considerations for particular Design Modification. Procedures give detailed instructions for preparing this document (Design Inputs, DI). After the review of DI and approval, RE can proceed with the design of plant modification in accordance with approved DI. In addition to DI, RE completes a Design Impact Evaluation Form to determine whether the plant design modification affects or is affected by key plant design analyses or regulatory programme requirements. If any design documents or drawings are affected and require revision as a result of the Design Impact Evaluation the RE shall identify and revise the drawings and documents. Equipment Qualification (EQ) Programme in NPP Krsko is currently in development phase, however Design Impact Evaluation is performed also regarding the EQ concern. New installed equipment is screened in accordance with the requirements from the 10 CFR 50.49. If new or replaced equipment is recognised as a EQ equipment, it will be purchased and installed in accordance with all EQ requirements.

Which are the design requirements and the measures taken to handle severe accidents?

(See response to the question from Germany above)

Article 19: Operation

What is the approach concerning storage of spent fuel?
Presently the NPP Krsko spent fuel is stored on site in the Spent Fuel Pit with the capacity of 828 positions. End of 1998 530 spent fuel assemblies were stored. Remaining capacity would suffice for the next 5 years of operation. Short term solution for storing the spent fuel is to increase the capacity of the SFP by replacing the existing fuel racks with denser ones. Long term policy is still under consideration.

19.4 Anticipated operational occurrences and accidents The report states that :?The Krsko NPP has developed and applied the full set of Abnormal Operating Procedures (AOP) and Emergency Procedures (EOP)?. Are these sets of procedures reviewed by SNSA ? Are modifications to these procedures systematically checked during the operator?s simulator training?
SNSA has not performed a complete review of the AOPs and EOPs. The procedures are exposed to continuous verification process through operator's requalification training as well as through continuos WOG EOP programme. Each revision of NEK EOP procedures is first validated on the simulator. This will be further enhanced with the use of new plant specific simulator. Current revision of NPP Krsko EOP is Rev.7. SNSA is approving yearly programme of the operator?s training and auditing the simulator training.

19.8 Radioactive wastes Information concerning spent fuel storage is missing. Could Slovenia give information on this subject?
Presently the NPP Krsko spent fuel is stored on site in the Spent Fuel Pit with the capacity of 828 positions. End of 1998 530 spent fuel assemblies were stored. Remaining capacity would suffice for the next 5 years of operation. Short term solution for storing the spent fuel is to increase the capacity of the SFP by replacing the existing fuel racks with denser mesh. Long term policy is still under consideration.

What is the granted license time after the commissioning period is completed?
Operating license has no explicit time limitation. Implicitly the life time of the plant is limited by the FSAR, which is a licensing document, by the design lifetime of the reactor vessel 32 EFPY which is estimated to be approx. 40 years of normal operation.

Which is the SNSA review and control process for design modifications being implemented by the operator? Is there an independent review?
All proposed changes to the plant hardware and software are sent to SNSA (in the form of the Change Summary Description and associated safety evaluation document according to 10 CFR 50.59) prior to the implementation. SNSA reviews each proposal and decides whether formal licensing is necessary. If safety evaluation presented by the NPP involves TS Change or unreviewed safety question existence licensing is obligatory.

How is the authorisation process applied when completing major renovations or modifications?
For each of the major changes in the licensing basis documents (Technical Specification, FSAR) the technical basis documents are independently reviewed by authorised organisation. Based on that review independent evaluation is prepared and submitted to SNSA together with licensing application (proposed FSAR, TS changes with technical background documents - analyses, etc.). (See also response to Spanish question above).

Which is the scope and layout of the emergency operating procedures? How are they verified and validated?
NEK specific emergency operating procedures have been developed based on generic Westinghouse Owners Group

EOP procedures. Initially generic procedures have been developed based on Westinghouse engineering simulator verification as well as full scope simulator and other available analytical tools. NEK plant specific EOP procedures have been validated on two loop PWR simulator which have been used for NEK operators requalification training (Kewaunee) at the end of 80s. It has to be pointed out that EOP procedures are exposed to continuo verification process through operator's requalification training as well as through continuos WOG EOP programme. Each revision of NEK EOP procedures are first validated on the simulator. Current revision of NPP Krsko EOP is Rev.7.

Modification activities are important for old and middle age plants to keep their safety and operation capabilities updated. On the other hand it is possible that these activities influence some aspects of the basic concepts in original design.

What are criteria to initiate and implement modification requests in NPP Krsko?
Is there ranking of the requests based on safety or based on any other benefits of the proposed modification?

Who is responsible for approving plant modification based projects and who is involved in verification?

What measures are used to preclude adverse influence of planned modification activity on basic safety concept of the plant and/or on the some part of the plant not being subject of modification?

Criteria

Officially a request for some modification is started through the Initiation of Engineering Evaluation and Assistance Request (EEAR). Request could be initiated by anybody on the plant, however his Superintendent should approve it before release. EEAR is submitted to the Technical Operation Manager who is classifying approved request depend of the kind of the request. E&DC Superintendent who will determine responsible engineer (RE) for the evaluation will review such request. RE have to prepare the evaluation and obtain the concurrence of the proposed solution with the EEAR initiator and System Engineer. After the E&DC Superintendent approval, the proposed solution is presented in a front of Krsko Operating Committee (KOC) which shall give the concurrence to the proposed solution. After such approval the RE will start with development of Design Modification Documentation.

Small problems (low budget) resolutions can be started without the previous presentation in front of KOC, however the final resolution have to be approved by KOC.

Ranking

In the initial phase the EEAR request will be ranked in accordance of the subject of request through following criteria:

- Priority 1A: require immediate action to keep plant running, could have an effect on nuclear safety, require immediate response to a regulatory action.
- Priority 1B: require promptly action due to the procurement related EEAR?s from QA, TO, etc.
- Priority 2A: regulatory or licensing commitment (due date < 1 year).
- Priority 2B: requests for drawing, document, procedures etc change.
- Priority 3: regulatory or licensing commitment (due date > 1 year).
- Priority 4: long term improvement in production, reliability etc.
- Priority 5: preferential request for routine item or activity.
- Priority 6: low priority request (no action just for record).

In addition with ranking (see above) the procedure for the Prioritisation of requests for the Design Modifications will be prepared. This procedure is in the review phase and will be approved in the first half of this year. The intention of this procedure will be to prescribe the uniform approach to the prioritisation of EEAR?s requests from the following prospective:

- Increasing of Nuclear Safety (PSA will be used as a tool)
- Increasing of the reliability (enhancement of operation process)
- Increasing of Safety on Work

- Enhancement of ALARA
- Improvement or enhance of maintenance
- Cost benefit (benefit will be compared with the required estimated costs)

Approval and verification team

In accordance with Prioritisation procedure (in review) the team consisting of Technical, Operation, Maintenance and Engineering Managers will be responsible for the projects start approval. Basically the same group is also currently approving projects. When the Design Modification Package is prepared it is reviewed by several reviewers: System Engineer, Peer Reviewer, other reviewers (ALARA, EQ...), QA and E&DC Superintendent. Each modification should be approved before the implementation also by KOC and by Krsko Safety Committee, if Safety Evaluation was performed for the particular modification.

Influence to the basic safety concept

Modification Process in NPP Krsko is covered by set of Engineering Procedure giving an uniform approach how to prepare particular Design Change Documentation. During the preparing of Design Change Documentation each Responsible Engineer (RE) should prepare a design input document, which define the design inputs, bases and other considerations for particular Design Modification. Procedure ESP-2.604 Design Considerations, Bases and Inputs is giving detail instructions for preparing this document (Design Inputs, DI). After the review of DI and approval the RE can proceed with the design of plant modification in accordance with approved DI. In addition to the DI shall RE complete a Design Impact Evaluation Form to determine whether the plant design modification affects or is affected by key plant design analyses or regulatory programme requirements. If any design documents or drawings are affected and require revision as a result of the Design Impact Evaluation the RE shall identify and revise the drawings and documents.

For each modification also Screening process in accordance with 10 CFR 50.59 have to be performed. During executing of Safety Evaluation and Screening (SES) and (if required) Safety Evaluation (SE) possible influence to the Safety of the Plant should be recognised. Each SES and SE has to be submitted to the Licensing department for approval. After licensing approval each SES and SE are reviewed by KOC and KSC.

If SE was performed it should be submitted also to SNSA. NPP Krsko has to get approval of SE from SNSA before implementation of modification.