URSJV-RP-041

NUCLEAR AND RADIOLOGICAL SAFETY IN SLOVENIA IN 1998

ANNUAL REPORT 1998

Republic of Slovenia, Ministry of Environment and Spatial Planning
Slovenian Nuclear Safety Administration

URSJV-RP-039

NUCLEAR AND RADIOLOGICAL SAFETY IN SLOVENIA IN 1998

SUMMARY

EDITOR: **Davor Lovinčič MSc**

AUTHORS: Milena Černilogar Radež, Mojca Fon Jager, Helena Janžekovič Ph.D., Aleš Janežič MSc., Igor Grlicarev MSc., Laura Kristančič Dešman, Milko Križman MSc., Marjan F. Levstek MSc., Davor Lovinčič MSc., Egon Lukacs, Nataša Mavec, Igor Osojnik, Maksimilijan Pečnik, Zoran Petrovič, Matjaž Pristavec MSc., Darko Pungerčar MSc., Leonidis Radik MD, Aleš Škraban, Tomaž Šutej Ph.D., Leopold Vrankar MSc.,

Ljubljana, April 1999

Republic of Slovenia, Ministry of Environment and Physical Planning
Slovenian Nuclear Safety Administration
Vojkova 59, 61113 Ljubljana, Slovenia,
Phone.: +386 61 172 1100, fax: +386 61 172 1199
RCF-822: rujv@gov.si
http://www.gov.si/ursjv/index.html

CONTENTS

INTRODUCTION

Slovenian Nuclear Safety Administration (SNSA), in co-operation with the Health Inspectorate of the Republic of Slovenia, the Administration for Civil Protection and Disaster Relief and the Ministry of the Interior, has prepared a Report on Nuclear and Radiation Safety in the Republic of Slovenia for 1998. This is one of the regular forms of reporting on the work of the Administration to the Government and National Assembly of the Republic of Slovenia. Contributions to the report were furthermore prepared by competent authorities in the field of nuclear safety: the Agency for Radwaste Management (ARAO), the Milan Čopič Nuclear Training Centre, etc.

STRUCTURE OF THE SNSA AND ITS SCOPE OF COMPETENCE

The structure or organisational scheme of the SNSA was not substantially changed in 1998. The Administration still consists of 5 divisions. The number of staff increased from 32 to 35, which is still below the recommendation of the European Union mission RAMG. It is worth noting that as many as 28 of the staff have professional examination qualification. Two workers have successfully concluded a seven-week Power Reactor Technology course. Three workers are supported by the SNSA in their post-graduate in-training. The SNSA staff have also received fairly intensive training on other expert courses at home and abroad.

LEGISLATION IN THE FIELD OF NUCLEAR AND RADIATION SAFETY

With respect to international legally binding documents it is worth mentioning that on November 26, 1998 the Republic of Slovenia signed the Protocol Additional to the Agreement between Slovenia and the IAEA for the Application of Safeguards. The Protocol shall enter into force after the ratification in the Slovenian Parliament.

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, which was signed in 1997, is to be ratified at the beginning of the year 1999 since the ratification process on the Governmental and Parliamentarian level was almost concluded by the end of 1988.

Based on a decision of the Government of the Republic of Slovenia, representatives of the SNSA presented at the OECD/NEA meeting of the Regulatory Experts for the Third Party Liability in the Field of Nuclear Energy in November 1998 Slovenia's intention to accede to the Paris Convention. It is planned that the formal notification by the Republic of Slovenia of its application to accede to the Paris Convention will be deposited by the Secretary General of the OECD in the beginning of 1999.

A bilateral agreement for the early exchange of information in the case of a radiological emergency was signed on April 22, 1998 between Slovenia and Croatia and it is expected that it will be ratified by the Slovenian Parliament in the beginning of 1999.

The stipulation of agreements in the area of exchange of information and co-operation in the field of nuclear and radiological safety with regulatory bodies of the Czech Republic, Slovak Republic, France, South Africa and South Korea was in progress during 1998 and it is expected that the signing will take place in 1999.

In 1998 also the initiative was taken to renew for further five years the existent bilateral arrangement between the SNSA and the US NRC for the Exchange of Technical Information and Co-operation in Nuclear Safety Matters.

On the domestic legislative scene some developments were also made. Most of time was spent for the activities devoted to the harmonisation of the Slovenian legal system with the EU legislation within the accession process which intensified in 1998. Based on "gap analyses" the review of all relevant EU legislation which is only partially covered or not covered at all by domestic laws was prepared and a time table for the transposition was adopted.

At the end of 1998 the preparation of a new Decree on Import and Export of Certain Goods was prepared and submitted to the Government for adoption. With this decree Slovenia will establish a complete export control of equipment or material especially designated or prepared for the processing use or production of special fissionable material and fulfilled the requirement of the NPT set forth in the Paragraph 2 of Article III.

On November 26, 1998 the Government of the Republic of Slovenia adopted a Decree pursuant to which the amount of liability of a nuclear operator in Slovenia was amended from the amount called for under the 1963 Vienna Convention in Nuclear Liability to the amount of US $ 42,000,000 per nuclear accident.

The revision of the existent law or better the preparation of the new law on nuclear and radiation safety and new law on third part liability for nuclear damage intensified in 1998.

INTERNATIONAL CO-OPERATION

From 21 to 25 September 1998 the General Conference of the IAEA was held in Vienna. The Slovenian delegation was represented by experts of the Slovenian Nuclear Safety Administration, Embassy of the Republic of Slovenia to Vienna, Ministry of Economic Affairs and the Institute Jožef Stefan. Slovenia actively participated in the work of the IAEA General Conference by cosponsoring six resolutions. Finally, 22 resolutions and 2 presidential statements were accepted.
It should be mentioned that at the first session after the General Conference, Mr. Miroslav Gregorič, M.Sc., Director of the SNSA, was elected as the Chairman of the Board of Governors for the period of one year.
Co-operation between our state and IAEA has been most intensive in the area of technical assistance and co-operation and in

participation in international meetings. Within the scope of co-operation between the SNSA and IAEA, Slovenia hosted a number of fellowships and scientific visits.
In 1998 the SNSA submitted to IAEA 16 research contract proposals, of which 7 were new. The majority of proposals was prepared by the Jožef Stefan Institute.

Technical assistance projects are often the most demanding form of co-operation. It requires a lot of funds and expert activities by project holders. In 1997 the SNSA proposed 6 projects for technical assistance. In 1998 the Agency completed the evaluation of the projects and for the period of 1999/2000 accepted 4 TC projects one of them being a "footnote a" project. Activities were continued on the existent projects, including: Licensing of Steam Generators Replacement in the Krško NPP and for Increasing the Thermal Power (SNSA), Beam Transport System at the Van de Graaff Accelerator (JSI), Remediation of the Žirovski Vrh Uranium Mine and Milling Site (ŽVMine) and Early Warning System for Radiological Emergencies (SNSA).

The Slovenian delegation took part in the organisational meeting of Contracting Parties to the Convention on Nuclear Safety which was held at the headquarters of the IAEA from October 2 to November 29, 1998.
On the very first day of the meeting the Slovenian representatives handed over to the Secretariat of the meeting the (Slovenian) National Report on the fulfilment of obligations of the Convention on Nuclear Safety. At the end of 1998 the preparation for the review meeting also started.

The co-operation with the EU has been realised primarily through the participation of the SNSA experts in the meetings of the CONCERT Group taking place in Ljubljana (hosted by the SNSA) and Brussels and in the meetings of the CONCERT Bureau. Furthermore, Slovenia participated for the first time (as observer) in the meeting of the NRWG (Nuclear Regulatory Working Group) in Brussels. At the second meeting in November Slovenia actively participated in the work of the group.
The second year RAMG (Regulatory Assistance Management Group) was concluded in early 1998. In March 1998 the preliminary table was prepared jointly by the SNSA and the representatives of the EU (ANPA, AVN, HSE, DSIN, CSN; and BMU). The meeting outlined the proposed areas for the 3rd year of programme based on medium term development objectives of the SNSA.

In the year 1998 the co-operation with the EC has been intensified due to accession activities. The harmonisation of the Slovene existent legislation with the EU legislation was implemented through the preparation of the National Plan for Adoption of Aquis rather than through the preparation of the new legislation. A number of activities were dedicated to the preparation for bilateral screenings, transpositions of EU directives in the existing legal frame or in the proposed new legal documents. The EC also took

the initiative to organise the ECURIE meeting (European Community Urgent Radiological Information Exchange) in Slovenia in 1999.

The co-operation with the OECD/NEA remains informal and non-institutional since Slovenia is not a member of the OECD nor the OECD/NEA. Nevertheless, the co-operation was fruitful and was carried out through the participation of Slovenian experts in training courses and seminars organised by the OECD/NEA and also in the INEX emergency exercise (2-HUN) organised by the OECD/NEA. A very important step towards close co-operation with the said organisation was made in November when Slovenian experts at the Meeting of the Regulatory Experts for the Third Party Liability in the Filed of Nuclear Energy presented their intention to the Slovenian accession to the Paris Convention on the Third Party Liability in the Field of Nuclear Energy.

PROVIDING PUBLIC INFORMATION

Provision of open and authentic information to the public is a fundamental policy of the SNSA. The Report on Nuclear and Radiation Safety in 1997 was published in **Poročevalec** (Reporter), the publication of the National Assembly, and is available in public libraries throughout Slovenia and on the Internet in Slovene and English.

Reports on the SNSA activities are also published in the bulletin **Okolje in prostor** (Environment and Physical Planning). In 1998, 25 articles were published.

For several years the SNSA has been endeavouring to maintain continuity in translating some of the basic IAEA publications. In 1998 the SNSA completed the translation of:

- International Basic Safety Standards for Protection against Ionising Radiation and for the Safety of Radiation Sources (Safety Series No. 115),
- Intervention Criteria in a Nuclear or Radiation Emergency (Safety Series No. 109),
- Safety Regulations for the Safe Transport of the Radioactive Materials (Requirements No. ST-1).

These books will be published in early 1999 and will be distributed free of charge to the institutions concerned.

BUDGET OF THE SNSA AND ITS REALISATION

The funds assigned from the national budget to the SNSA were in reality at the same level as in the previous years. Particularly worrying is the fact that the implementation of some programme activities in the area of nuclear and radiation safety is being made difficult. It is expected that in the future the situation should improve since the demanding activities within the process of accession to the European Union will require additional man-power engagement and financial support.

EXPERT COMMISSIONS AND OTHER SNSA ACTIVITIES

The Nuclear Safety Expert Commission (NSEC), which has an advisory role to the SNSA for different questions (for example, the annual report of SNSA, important licences issued to the nuclear facilities, drafts of laws and regulations...), met five times in 1998. It consists of 22 members, 10 officials from ministries and 12 experts in nuclear and radiation safety. Within the SNSA there is also an Expert Commission for Operators Exams, which holds exams to asses the professional competence of the staff (operators) of the Krško NPP. " In 1998, the Commission organised three exams for 27 candidates, of which 14 candidates took the exam to licenses for the senior reactor operators (SRO) and 13 candidates took the exam to licenses for the reactor operators (RO)."

THE STATE OF NUCLEAR SAFETY IN SLOVENIA

Inspectors of the SNSA carried out surveillance of operation of nuclear facilities in accordance with their competencies and the approved yearly programme of inspection in 1998.
Based on findings of the inspections and the earlier experience it was concluded that:

* the Nuclear Safety Inspection Division for surveillance of the facilities successfully co-operated with other administration and inspection bodies;
* during the 1998 annual refuelling outage, the outage works, maintenance functional and start-up tests on systems and components of the Krško NPP complied with the technical specifications and acceptance criteria, defined in the approved procedures. This can be seen also from the reports and expert opinions of the technical support organisations, which the Krško NPP and the technical support organisations considered during non-routine inspections;
* in 1998, there was no automatic shutdown of the reactor;
* all unusual events reported by the Krško NPP were discussed during inspections in order to clarify the causes, consequences and lessons learned;
* the SNSA Nuclear Safety Inspection Division performed the inspection of the compliance with the decisions, issued to the Krško NPP by the SNSA and did not find any irregularities;
* the SNSA Nuclear Safety Inspection Division reviewed monthly reports on radioactive emissions, however, no deviations from acceptable values were observed.

All safety systems for a safe shutdown of the power plant operated in compliance with the anticipated design parameters; in 1998, nuclear safety was not jeopardised.

In 1998, operation of the research reactor TRIGA Mark II (RR Triga Mark II) at the Jožef Stefan Institute Reactor Centre at Podgorica complied with technical specifications. Admission into the cellar and the reactor hall was controlled and the register of entrances of experimenters, maintenance stuff and visitors was consistently kept. The reactor operated through all year without deviations, also during the summer leave; the operation of the reactor was abandoned only for maintenance reasons.

The radioactive waste in the temporary storage of low and intermediate level radioactive waste at the Krško NPP and in the interim storage of radioactive waste of the Reactor Centre at Podgorica is stored in compliance with the legislation and the records are correctly and consistently kept. However, in 1998, the interim storage did not accept radioactive waste from external users due to unsolved status in connection with the transfer of competence for the interim storage management from the Jožef Stefan Institute to the public agency ARAO.
After repacking of radioactive waste at the temporary storage of low and intermediate level radioactive waste at Zavratec in 1996, there was no change in 1998. The SNSA started with the activity for issuing the licence for shipment of radioactive waste from Zavratec to interim Radwaste storage at Brinje.

In 1998, the Krško NPP generated 5,018,650 MWh (5.0 TWh) of electric energy at the output of the generator, or 4,793,604 MWh (4.8 TWh) net. The generator was connected to the electrical grid for 7913.07 hours or 90.33% of the total number of hours in the year. The electric production was 7.48% higher than planned.
The generation of thermal energy in the Krško NPP reactor was 14,467,675 MWh. The whole production of the electric energy in Slovenia was 12,490 GWh, the share of the nuclear energy production being 38.3%.
In addition to record production and load factor, the operational reliability of the Krško NPP was also at a very high level. In 1998 there were no significant reductions of power, there were only three abnormal events which had no impact on the environment. According to the International Nuclear Event Scale (INES) the events were graded as events "not relevant for the nuclear safety", degree 0.

The period between two refuelling outages is called the reactor fuel cycle. In 1998, the 14th and the 15th fuel cycles were taking place. The 14th fuel cycle started on 10 June 1997, continued into 1998 and was completed on 24 April 1998, as planned. The 15th cycle started on 29 May 1998 and is to be completed in April 1999.

The comparison of the basic indicators of fuel reliability for 1998 showed that there were no damages on fuel rods and that the introduction of modified fuel elements was justified. During the 14th fuel cycle the Krško NPP for the first time used modified fuel with a new bottom nozzle of the fuel element called "Debris Filter Bottom Nozzle (DFBN)" which proved effective in the Krško NPP. The advantage of the new nozzle is a higher density grid that intercepts any foreign particles.

In 1998, the activities on the steam generators of the Krško NPP were twofold:
* inspection and remediation of the existing steam generators,
* project of steam generators replacement.

In order to define the level of failure in both steam generators a 100% inspection of tubes was necessary during the 1998 annual outage. For inspection of tubes the eddy current technique (ECT)

was used and for the first time a weldless sleeves technology was used.
The inspection was carried out on 3751 tubes in operation in the steam generator No. 1 (SG1). In the steam generator No. 2 (SG2), 3898 tubes in operation were examined. In each steam generator there are 4568 tubes (SG1) or 4575 tubes (SG2), respectively.
The average share of plugged tubes in both steam generators, considering the impact of inserted sleeves, is 17.45%. The asymmetry of plugging between SG1 (19.15 %) and SG2 (15.76 %) is 3.39% and is inside approved limits and according to the conclusions of the Westinghouse study "NPP Krško 18% Steam Generator Tube Plugging Analysis Review", so that the Krško NPP may operate at 100% power.

In the field of nuclear safety a special emphasis was placed on the process of safety evaluation aspects of the ongoing steam generator replacement, power uprating, full scope plant specific simulator installation and other modifications which are a part of the plant modernisation project. The policy of close co-operation between the nuclear safety authority and the utility has been chosen which leads, step by step, to a timely completion of a licensing process. Technical Support Organisations are contracted to review and give an independent expert opinion for all safety evaluations.

The modernisation of the Krško NPP comprises two main projects:

a) Steam Generator Replacement and Power Uprating

- Manufacturing of the steam generators: the steam generators are in the final phase of assembly in the Spanish company ENSA. QA audits took place at the ENSA plant at Sandvik, Sweden, and at Siemens, Germany. After manufacturing and acceptance testing the steam generators will be ready for the transport to the Krško NPP in September of 1999.
- Steam generator replacement: the co-ordination activities between all contractors of the modernisation project (Siemens, Framatome, Westinghouse, Parsons Power) are taking place. The construction permits for all necessary civil engineering activities have been acquired. The replacement is planned to be carried out during the year 2000 outage.
- Safety analyses for the 6.3% power uprate of the Krško NPP after the steam generators replacement were performed by Westinghouse.

b) The full scope simulator manufacturing for the Krško NPP is in progress. Verification, Qualification and Licensing phase will take place in 1999. The assembly of the simulator panels is in the final phase. A new simulator building has been under construction since December 1998.

Additionally to the main modernisation projects, an extensive modification programme to increase the plant safety is in progress. NPP Krško carried out all together 34 modifications, 10 major ones in accordance with decrees issued by the SNSA and 24 minor ones of which the SNSA was notified only.

This includes improvements in the power plant itself based on the best international practices and the latest findings in the nuclear field. The Krško NPP prepares and evaluates technical modifications in accordance with domestic legislation or legislation of the supplying country using its own procedure. The Krško NPP is liable to inform the SNSA on modifications of safety evaluations. For the modifications which are essential for the Krško NPP nuclear safety, it initiates an administrative procedure with the SNSA to acquire the licence. In certain cases, based on safety evaluations of modifications review, the SNSA requires from the Krško NPP to initiate an administrative procedure for granting the licence.

The spent nuclear fuel is kept in the spent fuel pool. The grids with 828 positions for storing the nuclear fuel occupy approximately two thirds of the pool. By the end of 1998, 530 fuel elements were stored in the pool. In reality, there are 170 positions available for storage of fuel elements, which is sufficient for maximum 5 years of operation of the Krško NPP.

During operation of the NPP various radioactive waste materials in gaseous, liquid and solid state are generated, which are disposed of through the radioactive waste processing system. The processed wastes are categorised as low and intermediate level radioactive waste and are kept in 200 litre drums.

In 1998, 150 drums were filled with low and intermediate level radioactive wastes with total radioactivity 106.3 GBq. The total generated quantity of standard 200 l drums is 12,805 with total radioactivity 26,297.3 GBq.

The competent administrative authorities were regularly informed about the releases of radioactive waste into the environment by the Krško NPP on daily, weekly, monthly, quarterly and yearly basis in 1998.
The liquid releases into the Sava river are registered for the main water supply, discharging into the Sava river in front of the dam. The major contribution to the dose is done by the radionuclides caesium and cobalt. In liquid releases, the dominating radionuclide was tritium (H-3). In 1998, the annual released activity of this radionuclide was 8.69 TBq, which was approximately 43.3% of the annual limit value 20 TBq. The annual activity of other radionuclides in liquid releases was about a thousand times lower.
Radioactive gases from the Krško NPP were released to the atmosphere mainly from the reactor building stack and through the vent of the condenser in the secondary coolant loop. In 1998, the released radioactivity of noble gases was 3.4 TBq, which is 3% of the acceptable annual value. A considerable increase of radioiodine

in gaseous releases was observed in May, which was due to refuelling and not to regular operating of the Krško NPP.

The Radiation Protection Unit at the Krško NPP is organised for the task of measuring, calculating and regular recording of received effective doses for all workers, who have access to the controlled area of the power plant, regardless if they are members of the NPP staff or external contractors.
In 1998, the average effective dose to workers was 1.46 mSv, which is approximately 2.9% of dose limit to workers who are professionally exposed to ionising radiation (the Regulation on Dose Limits to Population and Radiation Workers, Off. Gaz. SFRY, No. 31/89) or 7.3% of it in accordance with the latest recommendations ICRP (1991) and BSS (1996). The average effective dose to workers from the NPP was 0.79 mSv and to external workers 1.91 mSv. Workers received the major part of the dose during the annual outage of the power plant. It was established that the received effective doses in the NPP in 1997 were lower in comparison with the world average, which is 2.5 mSv (UNSCEAR 1993). In 1998, no radiological event at the Krško NPP occurred to cause unplanned exposure of workers either from external radiation or from internal or external contamination. The legal and operational dose limits to an individual were not exceeded.

The activities related to shipment of spent fuel from research reactor TRIGA Mark II back to the United States were limited to negotiations on language of contract and to administrative and preparatory work in Slovenia. By the end of the year the representatives of DOE provided more detail on shipment. According to information the shipment will take place in July 1999. On the same ship there will be a cask with spent research reactor fuel from Germany, Denmark, Italy, Romania and Slovenia.

In 1998, the activities of the Žirovski Vrh Mine in implementing the programme of permanent cessation of uranium ore exploitation and preventing the negative impact of the mine were performed according to the Operational plan approved by the Government. Due to big differences between planned and performed works an updated Programme, which was approved by the Government in December 1998, was prepared according to the agreement between the Ministry of Environment and Physical Planning and the Žirovski Vrh Mine.
According to the new approved Programme of permanent cessation of uranium ore exploitation and preventing the negative impact of the mine all remedial works on the ore processing site and remediation of hydrometallurgic tailings at Boršt and mine waste disposal at Jazbec will be finished till 2005.

In the scope of decommissioning, the Radiological Protection Unit of the Žirovski Vrh Mine carried out regular monitoring of the working site for uranium ore extraction and for uranium concentrate production, and measured contamination of the waste material and the facility surfaces.

RADIATION SAFETY IN THE LIVING ENVIRONMENT

Radiation protection of general public is provided by the Law on Radiation Protection and Nuclear Safety (OJ SFRY 62/84) and relevant regulations (Z1-OJ SFRY 40/86, Z2- OJ SFRY 51/86, Z6-OJ SFRY 31/89, Z9-OJ SFRY 8/87). Radioactivity monitoring in Slovenia comprises Radiation Early Warning System, which enables immediate detection of increased radiation on the territory of Slovenia, regular radioactivity monitoring of global contamination in the environment and monitoring in the surroundings of nuclear facilities.

The SNSA is the competent authority for providing radiation monitoring and exchange of information on radiation data. Thirty seven probes for dose rate measurement of external radiation with real time data retrieval are installed throughout Slovenia. In the last year an automatic aerosol monitoring system and radon progeny measurements were included in the network system. The SNSA weekly sends data from Slovenian CROSS network system to the European network system EURDEP in the European centre JRC in Ispra (Italy), which collects data from European national networks. By joining the European network the SNSA gained the possibility to have the data from other European countries.

In 1998, the regular monitoring programme of global contamination in the environment in the Republic of Slovenia was the same as in previous years. The basic scope of the programme was determined by the Regulations (Off. Gaz. SFRY, No. 40/86). Considering the results of measurements of environmental radioactivity the technical support organisations claimed that the annual intake of artificial radionuclides was well within the prescribed limits. The total annual effective dose caused by artificial radionuclides from inhalation, ingesting and from external radiation, due to global radioactive contamination, was estimated to be about 57 microSv. This was within the range of average world values.

The radioactivity monitoring programme in the environment of the Krško NPP was approved by the SNSA. It consists of the control of its liquid and gaseous radioactive releases into the environment and of the control of radioactivity in the environment. The area under most thorough surveillance is the 12 km circle around the facility, where the highest impact of emissions is expected and the potential changes can be detected first; the surveillance of the area along the Sava river and of the underground water is extended to the territory of the Republic of Croatia from Jesenice na Dolenjskem to Podsused (at 30 km distance from the facility). An estimation of the annual effective dose to an individual member of the public due to emissions from the nuclear power plant gives an effective dose value of 13.2 microSv for 1998. This value represents less than 1% of the average annual effective dose from natural and artificial radiation sources to which individuals are normally exposed. By measurement of selected samples, it was possible to estimate the annual doses due to natural radioactivity, general pollution (contribution of Chernobyl, atmospheric nuclear tests), and from industry and hospitals where radioactive substances are used.

Radioactivity monitoring in the surrounding of the Reactor Centre at Podgorica in 1998 was carried out in accordance with the same programme as in the past. In reactor operation and other related activities in 1998 there were no special events found and the total produced thermal power was similar as in previous years. There was no change in the release of ^{41}Ar and liquid effluents resulting from the research work at the Department for environmental chemistry. The estimates of immersion dose due to ^{41}Ar release and the ingestion dose due to discharge of effluents into the Sava river were 0.25 microSv and 0,20 microSv respectively.

The radioactivity measurements showed that the cessation of uranium ore exploitation only partly reduced the impact of the Žirovski Vrh Mine to the environment even eight years after its closure. Radionuclides in liquid effluents (uranium, radium) and the annual emission of radon from a pit and disposal sites slightly increased in 1998. The most important source of radioactive contamination at the Žirovski Vrh Mine remains radon ^{222}Rn and its short-lived progeny, which still contribute more than 4/5 of the additional exposure. The liquid effluents from the mine and disposal sites at Jazbec and Boršt increased the concentration of radioactive substances in surface waters passing the mine (the Todraščica and the Brebovčica). The local population do not use surface waters for drinking, irrigation or watering the cattle, so its radioactive contamination has no additional impact on their radiation exposure.

The effective dose to adult members of the public caused by the former uranium mining and milling is about one third (0,36 mSv) of the dose limit of 1 mSv per year. In comparison to the total amount of exposure, the Žirovski Vrh Mine represents around 6% of the average background radiation exposure in this area (around 5.5 mSv per year).

RADIATION PROTECTION IN THE WORKING ENVIRONMENT

In view of radiation protection against ionising radiation the Health Inspectorate of the Republic of Slovenia (HIRS) is empowered for the:

- assessment of applications for permission to conduct practices that entail or could entail exposure to radiation;
- the authorisation of such practices and of the sources associated with them, subject to certain specified conditions;
- the conduction of periodic inspections to verify compliance with the conditions; and
- the enforcement of any necessary actions to ensure compliance with the regulations and standards.

The Health Inspectorate controls the sources of ionising radiation and their use in nuclear facilities (Nuclear Power Plant Krško and Research Reactor at the "Jožef Stefan" Institute Ljubljana - JSI), in mines and other areas with higher radon concentration (Uranium mine Žirovski Vrh, Lead and Zinc Mine Mežica, Mercury Mine in Idrija, the Postojna caves, temporary deposit of radioactive waste near the village Zavratec, schools, kindergartens, some fly-ash

deposits), in industry (approximately 440 sealed sources and 93 RTG-devices in nearly 100 companies), in medicine (Institute of Oncology Ljubljana, laboratories for nuclear medicine in 7 medical centres, approximately 700 RTG-devices for diagnostics), in agriculture, veterinary purposes, research and teaching (approximately 30 radiochemical and other laboratories). Fire-detectors (about 20,000) are also registered and controlled. Spent or useless radiation sources and solid radioactive waste from medicine and industries (other than waste from uranium mine and from nuclear facilities) can be safely stored in a specially designed storage place with an area of 250 m^2 at the Reactor Centre Brinje near Ljubljana.

The Ministry of Health – the Health Inspectorate in accordance with the Ministry of the Interior issues permissions for transport of radioactive materials on the territory of Slovenia. In 1998 252 permissions for national and international transport were issued. In 1998, the Inspectorate carried out 27 inspections considering also the transport of radioactive or potentially radioactive materials. Nineteen of these inspections were performed in those companies which recast, transport or collect metal scrap (6 inspections in Acroni Jesenice, one inspection in Metal Ravne, two in Slovenske železnice, four in Surovina Maribor, three in Dinos Ljubljana, one in Elektrokovina Maribor, one in MDM Ljubljana and one in Lucky). Italian experts for radioactivity measurements discovered slightly increased radioactivity of scrap and refused the import to Italy. On the basis of additional investigations eight regulatory decrees were issued.

In 1998, the Inspectorate carried out thirteen inspections in the Krško NPP. The inspectors observed no major irregularities or problems related to radiation protection in the Krško NPP. During the annual outage works, when some workers were exposed to doses of up to 15 mSv, the inspections were more frequent.

At the JSI, the HIRS carried out ten inspections, five in the Reactor Centre at Brinje (three of them jointly with the inspectors of the SNSA). Most of the workers went through the mandatory annual medical examinations required for persons working with sources of ionising radiation. With regard to radiation protection the inspections of the Research Reactor revealed some deficiencies in "hot cells", in attic and in cellar close to the laboratories for nuclear chemistry, and at the new linear accelerator.

The HIRS controls seven clinics and hospitals in Slovenia where open radiation sources are used (radiopharmaceuticals) for diagnostics and therapy (University Medical Centre of Ljubljana - the Department of Nuclear Medicine, the Institute of Oncology in Ljubljana, and hospitals in Maribor, Slovenj Gradec, Celje, Nova Gorica and Izola). The Inspectorate carried out six inspections (two in the Hospital of Celje, two in the University Medical Centre Ljubljana and two in the Institute of Oncology), where the requirements of the valid regulations on radiological protection were not complied with.

The HIRS carried out eight inspections in medical organisations to establish the state of x-ray departments and in particular, x-ray equipment and its operation in 1998. Regulatory decrees were issued to three users. Three x-rays were forbidden to be used by regulatory decrees and six orders to remedy the deficiencies in the area intended for x-ray diagnostics were issued.

The HIRS carried out an inspection of the temporary storage of radwaste (originating from the Institute of Oncology) in an abandoned barracks near the village of Zavratec. The situation was unchanged in comparison to the findings of the inspections in 1996 and 1997. No negative impact of the stored radioactive material on the population was found.

Altogether 4315 workers in Slovenia, working in the area of ionising radiation, were under regular dosimetric control in 1998: 2253 in medicine, 1278 in industry (with the Krško NPP), 471 workers were exposed to natural radiation sources at their workplaces (including the Žirovski Vrh Mine), and the remaining 313 persons in administration, research and other institutions (Ministry of the Interior, Ministry of Finance - Customs Administration, the SNSA, the Institute for Occupational Safety of the Republic of Slovenia, JSI, HIRS, etc.). No one exceeded the limit of annual effective dose of 20 mSv, which is derived limit value according to the latest international standards (IAEA BSS, 1996) and EU Directive (1996). However, 11 persons received doses exceeding 15 mSv.

STORAGE, TRANSPORT, PROTECTION AND IMPORT OF RADIOACTIVE RADWASTE AND NUCLEAR MATERIAL IN SLOVENIA

The storage, transport, protection and import of radioactive and nuclear material in Slovenia are governed by the Act on Radiological protection and the Safe Use of Nuclear Energy (Off. Gaz. SFRY, 62/84) and by its relevant regulations.
In recent years there has been a substantial increase in quantity of sealed radiation sources in the Interim Radwaste storage at Brinje. The sources are confined in special waste containers (only one source per container). The containers are distributed over the floor of the storage room occupying major part of the ground. In order to optimise the storage capacity the sources need to be rearranged. The refurbishment of storage is undoubtedly the first priority. The present capacity of the storage is insufficient to receive all the quantity of drums stored e.g. at Zavratec. The total volume of accumulated wastes in drums is 34.65 m^3 (drums by volume) and the special wastes volume is estimated to be several m^3. The volume of the active parts of the sealed sources is insignificant, but they take up substantially more place because of the protective containers in which they are kept.

The SNSA issued a licence to the Krško NPP for the purchase of 28 nuclear fuel elements.

In order to reduce the volume of radioactive waste NPP Krško sent, in November 1998, 228 drums of low-level radioactive waste (plastic, paper, textile materials, etc.) to be incinerated in Sweden.

Each drum contained about 100 kg of radioactive waste containing mainly Co-60, Co-58 and Cs-137. These drums were placed into industrial package Type 2 (Type IP-2) and transported by truck to Sweden. The PVC was manually outsorted and not incinerated. The burned residue (ashes and dust) was packed into 100 l drums, which were placed into standard 200 l drums and immobilised by concrete. It is estimated that the volume of waste by means of incineration will be reduced about three times. It is expected that the waste will be returned to Slovenia in late spring of 1999.

Following the conclusion of "Agreement between the Republic of Slovenia and International Atomic Energy Agency on Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons" the Republic of Slovenia negotiated and concluded in early 1998 the Additional Arrangements for implementation of the Agreement, Part a, general part.

The Republic of Slovenia has expressed its nuclear non-proliferation policy by signing the Protocol Additional to Safeguars Agreement on November 26, 1999. The SNSA is working on procedure for its ratification in the Slovenian Parliament. It is expected that the Protocol will be ratified in late 1999 or early 2000.

In order to comply with ratified international conventions and treaties, and to comply with international standards, Slovenia is recently putting significant efforts in modernisation of legislation and its enforcement in the area of nuclear non-proliferation. These efforts coincide with the modernisation of legislation adopted from the former Yugoslavia and with the harmonisation of legislation with the European Union.

The current trans-boundary movement of nuclear and radioactive material established the Decree on Imports and Exports of Specific Goods (Off. Gaz. RS, 75/1995). The responsible authority for licensing of trans-boundary movement is the Slovenian Nuclear Safety Administration (SNSA). The main deficiency of the existing legislation is that it does not include all items pursuant to paragraph 3.II of the NPT. For this reason it is proposed to strengthen the control of export of NPT items according to international standard as soon as possible. As a temporary measure, it was proposed to the Government to amend the Decree on Imports and Exports of Specific Goods in early 1999. The Decree will be amended to such extent that it will completely cover the items listed in the IAEA document INFCIRC 254, Rev 3, Part I, therefore it shall fulfil the provisions set in paragraph 3. II of the NPT. The licensing authority will be the SNSA.

For export control of the so-called *dual use items* (including those listed in the IAEA document INFCIRC 254, Part II), the Ministry of Economic Affairs, is in co-ordination with Ministry of Environment and Physical Planning - SNSA, Ministry of Defence, Ministry of Health, Ministry of Internal Affairs and Ministry of Finance - Customs preparing a Law on Export of Dual Use Items.

The purpose of the law is to enforce the control over export of equipment, material and technology, which may be used for the production of nuclear, chemical, biological weapons, or for the production and abuse of missile technology ammunition and explosives.

The IAEA Safeguard inspectors visited NPP Krško six times in 1998. No anomalies were reported. The research reactor TRIGA Mark II was subject to one IAEA inspection in 1998. The fresh fuel elements were verified by gamma spectroscopy. No anomalies were reported.

According to the Decree on Export and Import of Specific Goods, which entered into force on 1 January 1995, the SNSA issued 166 licenses, 150 of them for single import, 51 licences for multiple import (Karanta, Biomedis, Genos) and 10 licenses for export of goods (Sanolabor, Tobačna Ljubljana and Institute of Oncology) in 1998. Among regular importers of radionuclides are Biomedis, Karanta, Genos and Iris; the others import them only occasionally.

EMERGENCY PREPAREDNESS

In most cases, quick emergency response depends on immediate and comprehensive notification of an emergency event. For the purposes of this report only nuclear and ionising radiation risks are included.
The emergency plan (EP) regulates the notification procedures and the activities of the SNSA in order to fulfil its function in the event of emergency in a nuclear facility. The purpose of the emergency plan is: to provide suitably trained staff; means for operative measures in the event of emergency; and to ensure countermeasures to protect the population and the environment from radiological impact in the event of emergency. In 1998 the third revision of the emergency response plan, consisting of a set of 31 procedures, was carried out.

In 1998 the SNSA prepared the first revision of the Impact Assessment in Case of Nuclear or Radiological Emergency. This document was further used when the draft of the new National Radiological Emergency Plan was designed.

The Ecological Laboratory with Mobile Unit is a specialised emergency unit to carry out certain tasks in the field of protection, rescue and assistance in case of natural and other disaster and is organised to allow for immediate mobilisation. In the field of radiological activities the Ecological Laboratory with Mobile Unit is directly involved in the regular radioactivity monitoring programme in the vicinity of the Krško NPP; it also performs other radiological measurements and control (underground water, construction material analysis, analysis of food for import or export, etc.) and gives expert recommendations and expertise. In 1998 ELMU carried out three regular monitorings in the Krško NPP and its vicinity. During every monitoring, carefully planned in advance, the ELMU

measures the activity of certain liquid and gaseous samples in the Krško NPP and subsequently carries out special laboratory measurements (determination of H-3, C-14, Sr-89/90). The monitoring also involves the checking of permanent monitoring points in the surroundings of the Krško NPP (air and iodine pumps), measurement of basic radiological parameters (dose rate, surface contamination by beta and gamma radiation, gamma spectrum of unprotected Ge-detector, in-situ gamma measurements) and examination of 1/3 of potential monitoring points on the radiological monitoring map. After each inspection, the monitoring report is prepared.

On 3 November, 1998, Slovenia participated in an international exercise in the series of "INEX-2" exercise designed to test the communications and national emergency response plan in the event of nuclear emergency abroad. The exercise scenario details were not known in advance, except for the basic assumption that the nuclear accident was to happen in the Hungarian nuclear power plant in Paks. The whole cycle of exercises "INEX-2" was organised by the Nuclear Energy Agency at the Organisation for Economic Co-operation and Development (OECD/NEA).
In the exercise, the personnel from the Krško NPP participated as official observers and in the group for "media pressure", together with external experts to the expert groups of the SNSA from the Hydrometeorological Institute (HMZ), EIMV, JSI, University of Maribor - Faculty of Mechanical Engineering (FS), Slovenian electric Utility and the Institute for Occupational Health. In addition, the exercise, which was the third in the cycle, tested the bilateral agreement on early notification which was agreed between Slovenia and Hungary in 1995.

The year 1998 was the first year of implementation of the IAEA project RER/9/050 "Harmonisation of Emergency Preparedness in Countries of Central and Eastern Europe". There were two area group meetings between Poland, Czech Republic, Slovakia, Hungary, Romania, Croatia and Slovenia in the framework of this project. The first meeting was in Budapest in May 1998, and the second meeting was in June 1998, in Ljubljana. The meetings considered the following topics: classification scheme for reactor accidents, criteria for intervention levels, international agreements on early notification, self-assessment of the emergency preparedness in the country, integration of emergency planning zones across borders. On 13 October 1998 a communication exercise was held between the countries in the group. Slovenia sent participants to the "train-the-trainers" workshop on emergency preparedness related to TECDOC-953 and TECDOC-955, and to a workshop on classification scheme for reactor accidents.

In September 1998, there was a national emergency exercise, which postulated a release of a chlorine plume from the papermill in the vicinity of the Krško NPP. The Krško NPP participated in the exercise with the evacuation of on-site personnel testing the plant procedure "Actions in Case of a Chlorine Release". The exercise was upgraded with the scenario, which assumed that simultaneously

essential service water flow was reduced due to impurities in the river from the damaged truck caused by the traffic accident.

TECHNICAL SUPPORT ORGANIZATIONS

According to Article 14 of the Act on Implementing Protection against Ionising Radiation and Measures for the Safety of Nuclear Facilities (Off. Gaz. SRS, No. 28/80) technical and research organisations were authorised by the Republic Committee for Energy, Industry and Construction, or by the SNSA as its legal successor, with a decree to perform specific tasks within their activities and qualifications in the field of nuclear and radiation safety in the Republic of Slovenia.

Technical support organisations represent a vital part in monitoring operations, backfitting, introducing improvements and monitoring maintenance work on nuclear facilities. The work of technical support organisations is supplemental to the work of the Nuclear Safety Inspection Division which has insufficient manpower to cover all the activities in the nuclear facilities related to nuclear safety.

A report by the technical support organisations shows that major part of their engagement involves surveillance of annual outage and refuelling. With the replacement of steam generators the duration of annual outage will be shorter, and the Inspectorate and the technical support organisations should be prepared accordingly. The shorter outage will require better planning of surveillance activities and even better co-ordination and co-operation between the Krško NPP, the Inspectorate and the technical support organisations.

The report also shows that the technical support organisations take care of the regular training of their personnel in the fields within their responsibility. One vital part is the organisation of quality assurance, verified also by the SNSA. Some of the technical support organisations are taking steps to acquire an ISO certificate or accreditation for their laboratories.

RESEARCH PROJECTS AND STUDIES

In the budget year 1998, the SNSA financed and co-financed 12 research projects and analyses to support safety decision making and other development projects.

- Expert Evaluation of Probabilistic Safety Assessment of Nuclear Power Plant Krško (level 1), Section 15",
- Modelling of Krško NPP Containment by using CONTAIN Computer Code
- 0.5" Small Break Loss of Coolant Accident Calculation; Sever Accident Scenario Modeling by usig MELCOR Computer Code
- Stress Analyses of the Primary Cooling Loop in NPP Krško
- NPPs in our Neighbourhood – 1000 km
- Quality Assurance of the Whole Body Counter Measurements and Testing the Purity of the Radioisotopes and Radiopharmaceuticals used in Nuclear Medicine

- Integrated System of QA/QC Procedures of the SNSA for the Automatic Radiation Monitoring from Systems: EIMV, HMI, NPP, SNSA
- Pollution of Slovenian Rivers with I-131 due to the Use in Therapeutical Procedures in Nuclear Medicine
- The Study of Food Samples Excluded from the State Monitoring for the 1986 – 1997 Period
- Geological Map of the Area between Izvir and Stari Grad
- Geophysical and Geological Investigation at three Residuals of Middle Pleistocene Terraces at Stara vas near NPP Krško
- Seismities of the Krško Basin

THE AGENCY FOR RADWASTE MANAGEMENT

Among the most important goals of the RAO Agency are the preparation of a long-term radioactive waste management programme, the siting and construction of the LILW repository and the establishing of a national inventory of radioactive waste.

In order to achieve these goals in 1998 the RAO Agency prepared initial studies and experts opinion covering different aspects of waste management like production, storing, treatment and conditioning, storing and disposal of all LILW which are produced in Slovenia. These will be used in the next step for the preparation of the long-term strategy of LILW management.

The RAO Agency has continued also with activities related to the siting of LILW repository. A concept of the site selection procedure with communication plan was prepared. Simultaneously with the siting procedure methodology of applying site selection criteria for area survey was defined. The preparation of the design documentation with acceptance criteria for generic surface and underground repository has also started. As part of the safety analyses report preliminary performance and safety assessment studies for near surface LILW repository were initiated.

In the public relation field the RAO Agency has continued with the activities to improve the public perception of radioactive waste management from previous years. As a part of educational programme several new publications were prepared and published. The RAO Agency has also started to organise a visitor centre on radioactive waste management. A number of exhibits for visitor centre were under preparation. It is planned that the visitor centre will be opened in autumn 1999.

In the year 1998, the RAO Agency maintained the contacts with related organisations abroad and was included in several international projects. Those are the projects, which run as part of the PHARE programme in the field of radioactive waste management and are co-ordinated and financed through the EC. The RAO Agency also continued the work in the IAEA international programme entitled Improvement on Safety Assessment Methodologies for Near Surface Disposal - ISAM.

THE MILAN ČOPIČ NUCLEAR TRAINING CENTRE

The primary concern of the Milan Čopič Nuclear Training Centre (ICJT) is the training of personnel in nuclear technologies and ionising radiation and providing public information on these activities. The four main areas of activity of the Centre are: the training of the Krško NPP personnel, training activity in the field of radiological protection, organisation of international courses and meetings and public information.
In 1998 they organised one short course entitled Basics of Nuclear Reactor Technology for other institutions working for the Krško NPP. They also organised four operator retraining courses and six courses, which include simulator training. One year training course for future 19 operators was concluded in 1999.
In the field of radiological protection in 1998 they carried out 5 courses for medical personnel, for workers in industrial application of ionising radiation, and for JSI personnel.

In the year 1998, IAEA organised six one-week courses at the Centre.

In the field of public information they continued to invite elementary and high schools; students visited the centre in great numbers and attended lectures on nuclear technology and radioactive waste and saw the permanent exhibition. In the school year 1997/98 7427 students visited the centre.

INSURANCE AND REINSURANCE OF LIABILITY FOR NUCLEAR DAMAGE - POOL

The Pool for Insurance and Reinsurance of Nuclear Damage Risk GIZ / Nuclear pool GIZ) is a special legal form of an insurance company for insurance and reinsurance against nuclear damage risk. After the declaration of independence in Slovenia and Croatia the Nuclear Pool GIZ and the Croatian Nuclear Pool agreed to co-insure the Krško NPP in equal shares of 50 % in order to retain a good business relationship. For the period from 6 May 1998 to 5 May 1999 both pools issued insurance policies covering nuclear, fire and other risks to the property of the Krško NPP, with a total limit of 800 million USD. By the Act on Insurance of Liability for Nuclear Damage (Off. Gaz. SRS, 2/88, 6/89, 6/90 and Off. Gaz RS, 43/90 and 22/91 a limit of 5 million USD in SIT (Slovenian tolars) countervalue has been established. The Government of the Republic of Slovenia adopted on 26 November 1998 a special regulation that increased the limit for nuclear liability from USD 5 mio to USD 42 mio and an adjustment was made with the amount determined by the 1963 Vienna Convention on Civil Liability for Nuclear Damage. The Nuclear pool GIZ will, due to the above mentioned change, prepare adequate changes to TPL Policy with NPP Krško from 1 February 1999 onwards.
It is noteworthy that, up to the end of 1998, the Krško NPP did not report any damage to the Nuclear pool GIZ.

POOL FOR DECOMMISSIONING OF THE KRŠKO NPP AND FOR RADWASTE DISPOSAL FROM THE KRŠKO NPP

The Pool was established in conformity with the "Act on Pool for Decommissioning of the Krško NPP and for Radwaste Disposal from the Krško NPP" (Off. Gaz. RS, No. 75/94; in force from 17 December 1994; hereinafter called "the Act") with the purpose of raising funds for the decommissioning of the Krško NPP, and for storage and permanent disposal of low and intermediate level radioactive waste and spent fuel from the Krško NPP.

Due to outstanding payments of the Krško NPP to the Pool on 31 December 1996, the Pool instituted proceedings against the Krško NPP before the Krško district court. The proceedings ended on 12 May 1997 with an out-of-court arrangement in which the Krško NPP committed itself to paying, as of 1 January 1997, on the outstanding 1996 liabilities to the Pool the amount of 0.61 SIT/kWh until the outstanding amount of 6,581,943 SIT was settled. The rough estimate for settlement of the liabilities is 12 years.

In the following months of 1997, the Krško NPP paid to the Pool the amounts from the produced electric energy supplied to the Slovenian Electric Utility on respective maturity dates. The statement of account was prepared also for the Croatian co-owner; however, Croatia does not acknowledge the above mentioned methodology of raising funds from the per kWh price and, consequently, does not pay its share. Furthermore, Croatia has not yet given any guarantees to ensure its share of costs for decommissioning and radwaste disposal.

On 31 December 1998, the active assets of the Pool amounted up to 2,763,683 SIT; the long-term receivables totalled 9,699,883,000 SIT, of which the Slovenian debt was 3,708,943,000 SIT and the respective Croatian debt 5,990,940,000 SIT.

The free resources of the Pool will mainly be invested in first-class securities and deposits. The aim of this investment policy is to maintain the real value of investments and profitability. Of the three financial principles directing the Pool operation - the principles of safety, liquidity and profitability - the principle of safety has top priority.

Y2K PROBLEM IN SLOVENIA

Informatics is one of the most exposed business areas with the year 2000 problem, because millennium bug threats normal performance and functionality of IT services. The problem of year 2000, concerns also the Slovenian Nuclear Installations (Krsko NPP, TRIGA Research Reactor) and Slovenian Nuclear Safety Administration.

NPP Krško started with work on Y2K NEK project on November 1998, the purpose of which is to define objectives, methods and plan to attain Y2K (Year 2000) readiness, similar to guideline and method definitions in the NEI/NUSMG documents. The main Y2K-NEK project objectives are related to the execution of the inventory, analysis of initial assessment, detailed assessment, modification

implementation and contingency planning.
The fact is that no one of the power plant safety related systems is being controlled by computer based technology and no one of the power plant safety systems is being protected by computer based system. All systems (safety and non-safety) are being monitored by the plant computer (process information system) including radiation monitoring. Some of systems that are non-safety related (secondary circuits) are being controlled by some computers.
If NPP Krško did not undertake the NEK Y2K- project, many problems which are partially connected with operation, could emerge during the transition 1999/2000. In any case NPP Krško will be shutdown safely, because protection systems are not computer based, but they are based on old solid state protection technology (SSPS). The probability of the radioactive release is not greater than in normal conditions due to non-computer based protection system.
Contingency plan will be completed and approved till November 1999. If the contingency plan can not cope with the Y2K problem, consideration will be given to taking the NPP off.
If the external power supply breaks down, NPP Krško will automatically shut down, and two emergency diesel generators will provide energy for the safe shutdown (residual heat removal and other engineering safety features).
The Y2K project includes also co-operation with external infra-structures affecting NPP: power transmission grid, communication networks, expert systems of equipment and engineering suppliers, fuel deliveries, transportation (road vehicles, trains, flights,...)

The SNSA has been working on Y2K problem since the middle of 1998. The SNSA ensures that NPP Krško and Research Reactor Triga are aware of Y2K issues and is responding to them; particularly, that they are pursuing a course of actions to ensure that they remain safe and continue to operate within the requirements of their license with on-site inspections and co-ordination with other organisations involved. The SNSA is continuously monitoring the implementation of the Y2K-NEK project and the process of testing and is exchanging experience and know-how with other nuclear regulatory bodies by bilateral co-operation, with the International Atomic Energy Agency and with the US Nuclear Regulatory Commission.

The work on Y2K SNSA project will ensure readiness of its own required items; particularly Automatic Monitoring Radiation System - Early Warning System and Emergency Response Data System required to monitor or react to nuclear accidents. The objective of the project is also to be in an adequate state of alert during critical periods.

ADOPTION OF THE EU ACQUIS

In 1998 Slovenia began extensive work to align the domestic legislation with the legislation of the EU. The Euratom Treaty is one of the fundamental documents, which laid down the corner stone of the modern EU. The Euratom Treaty itself and the legislation derived from the requirements of this treaty form the framework which defines the activities of the EU member states in the field of nuclear safety, radiation protection, research, safeguards, supply of nuclear materials, external relations and peaceful uses of nuclear energy. This framework is equally important for the candidate countries which would like to become an EU member state. The efforts of Slovenia, as a candidate country, can be split into the following:

- set up a National Plan for the Adoption of the Acquis (NPAA),
- prepare the concept for the Position Paper,
- take part in the multilateral and bilateral screenings,
- participate in the meetings of the Subcommittee EU-SI for environment, energy and regional development.

The Slovenian Nuclear Safety Administration identified the most important issues to outline the accession strategy of Slovenia to EU in the area of nuclear safety, radiation protection and safeguards. The details of accession strategy and the action plan, on which the accession strategy is based on, and the working practices will be developed later. There are three basic categories which shall be considered in the accession strategy:

(a) review of the existing work, done on the accession of Slovenia to the EU, and the EU legislation,

(b) develop methods to meet and implement the EU requirements based on the Euratom Treaty,

(c) real practical tasks, which will be implemented in near future, in which the EU standards should apply.

Category (a):

- meet the requirements, which arise from the status of the Associated Country to the EU,
- follow the Guide to the Approximation of European Union Environmental Legislation (25/8/1997, SEC(97) 1608),
- meet the expectations of the Agenda 2000.

Category (b):

- prepare the draft of the new Law on Nuclear Safety and Radiation Protection for the Parliament; adopt all the secondary legislation which should be in accordance with the EU regulations and directives based on the Euratom Treaty,
- prepare a new legislation considering dual-purpose materials,
- ratify the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management,
- join the Paris and Brussels Convention on Third Party Liability in the Field of Nuclear Energy, or the revised

Vienna Convention on the Civil Liability for Nuclear Damage, and the Protocol on Additional Funding,
- join the OECD/NEA,
- participate in INEX-2 exercises, organised by the OECD/NEA,
- participate in the EU/DG XI Concert group/regulatory bodies of Western and Eastern Europe,

Category (c):
- perform the decommissioning of the uranium mine Žirovski Vrh mill tailings,
- replacement of steam generators at the Krško NPP and power uprate,
- installation of the full scope simulator at the Krško NPP,
- define the status of the Krško NPP in terms of ownership,
- site selection for repository of low and intermediate level radioactive waste,
- strengthening of the Slovenian Nuclear Safety Administration,
- prepare the National Report for the Meeting of the parties to the Convention on Nuclear Safety,
- complete the work on the Early Warning Network in case of a nuclear accident.

The adoption of the Acquis related to nuclear safety was organised in two major areas: (i) energy and nuclear safety, and (ii) nuclear safety and radiation protection.

The area of "energy and nuclear safety" comprises:

a) Nuclear Fuels Supply: Slovenia has not signed any agreement, which should prescribe the commercial terms for the purchase of nuclear fuels on foreign market. Materials for nuclear fuels and services are purchased on the free market. Slovenia shall strive that all long term contracts, which Slovenia signed with any party for the supply of natural or enriched uranium before the accession of Slovenia to the EU, should not be terminated (Art. 105 of the Euratom Treaty). Slovenia shall at the accession to the EU report all such contracts to the Commission.

b) Safeguards: Slovenia shall agree with the EU and IAEA the INFCIRC/193 type of Agreement (i. e. Agreement between the Non-nuclear Weapon States of the EAEC and the International Atomic Energy Agency) on implementation of Article III (1) and (4) of the Treaty on the Non-proliferation of Nuclear Weapons) and shall allow the EU safeguards inspectors to carry out their duties and establish such a reporting system to comply with the EU requirements.

c) External Relations: Slovenia is willing to comply with all international agreements in power in the EU and shall accede to them effectively with the accession to the EU.

Slovenia shall review all existing bilateral and multilateral agreements SI-third countries related to the peaceful use of nuclear energy to determine, if these agreements should be suspended after the accession of Slovenia to the EU.

d) Investments and Joint Undertakings: Slovenia has not shown the interest for Euratom loans yet, neither it is interested in the participation in Joint Undertakings.

The area of "nuclear safety and radiation protection" comprises:

a) Protection against the dangers of ionising radiation of the population, workers and patients (Directives: 96/29/EURATOM – BSS, 90/641/EURATOM – "outside workers", 97/43/EURATOM – "medical"),

b) "Sleeping" regulations in case of a nuclear accident (87/3954/EURATOM, 89/2218/EURATOM, 89/944/EURATOM, 89/2219/EEC, 90/770/EURATOM),

c) Import of goods following the accident at the Chernobyl nuclear power-station (90/737/EEC, 95/686/EC, 94/3034/EC),

d) Transport of Radioactive Goods and Waste,

e) Exchange of Information and Informing the Public in Case of a Radiological Emergency.

ISSN 1580-0628