



In 2009 high operational stability and economic effectiveness were achieved by the Krško Nuclear Power Plant. We remain dedicated to high operational standards and are aware that our high targets can even be exceeded. It is encouraging to note how high the safety culture level was, reflected in numerous management decisions, systematic training, independent auditing of the work processes, operational supervision and maintenance activities. Special appreciation goes to the enthusiasm and openness in reporting deviations, the response of all employees in solving the priority tasks, orientation towards learning and understanding technical challenges. Employees remain our greatest capital also in the future.

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INTRODUCTION

DEAR READER,

This Report provides an overview of achievements and crucial events which took place in 2009. It is with a sense of satisfaction that we report that the operational and business outputs have been achieved at the anticipated levels; moreover, some targets have been exceeded. This made our mission concerning the safe, reliable and competitive operation complete, the provisions of the Intergovernmental Agreement respected, and public acceptance ensured.

The 2009 operations were with the planned annual outage; nevertheless, its achieved availability was at the noteworthy level of 91.2 percent, without automatic or forced shutdowns. The output was 5460 GWh of electric power at a high level of safety systems availability. The effects on the environment were below the administrative limits. An additional affirmation of a responsible attitude of the plant towards the environment was the positive assessment by the external audit of the NPP quality system compliance with ISO 14001 standards. The audit demonstrated that the NPP employees do pay due care to the environment.

We continued to invest in upgrading technological systems. Major completed projects included the turbine control and protective system replacement and the relocation and upgrading of the 110 kV unit field which is part of the NPP switchyard modernisation programme to be carried out by NPP and ELES in the next few years.

A very high level of safety culture was achieved, reflected in various managerial decisions, the systematic approach to training, independent evaluation of work processes, operational supervision and the maintenance activities carried out. Special appreciation should be given for the enthusiasm and openness in deviation reporting, responsiveness of all staff in problem solving, and the orientation towards learning and understanding professional challenges.



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The project readiness for the outage was also raised to a higher level. All contracts with external contractors were concluded on time, thus enabling the timely completion of work.

Our cooperation with administrative bodies and company management bodies as well as with other organisations which support our programmes was excellent. A very high level of understanding concerning the provision of financial sources for the realisation of services and investments in the context of the plant life extension, procurement of fuel and equipment, was attained with the supervisory board. We worked closely together with the Slovenian Nuclear Safety Administration (S.N.S.A.) in preparation for legal regulations and thus made a contribution to their quality, implementation and acceptance in practice.

The recruitment process was resumed in hiring key staff to ensure safe and stable operations. All employees had a chance to pursue personal development by means of systematic training and additional education. Knowledge was exchanged and shared via international links. We worked on developing the working environment and relationships which encourage creativity and enthusiasm of individuals.

In terms of business results for 2009, all targets of the business plan were achieved. The realisation of the cost price per kWh was slightly lower than the budget figure. Long-term debts were reduced to the extent planned. All planned investments were realised. The resources available were managed economically and effectively. Successful business results gave a positive balance between income and expenditure; therefore, in accordance with the Articles of Association of Krško Nuclear Power Plant (NPP) payments were made in favour of the company owners.

MANAGEMENT BOARD

INTRODUCTION





IMPORTANT ACHIEVEMENTS IN 2009 AND CHALLENGES FOR 2010

The framework for Krško Nuclear Power Plant (NPP) in its operation is defined by nuclear safety and environmental standards, a critical public, intergovernmental contract and memorandum of association. Within these we endeavour to keep our vision alive and maintain our plant among the upper guarter of the world operating nuclear power plants with regard to standard nuclear safety criteria, operational stability and cost effectiveness. Every year we set targets which include internationally comparable indicators of operational efficiency as set by WANO, the operational, safety and economic targets and the targets concerning project implementation.

In 2009 the targets set were achieved and in many areas exceeded. The plant operated safely and reliably, without unplanned shutdowns. The output planned was exceeded and the projects aimed at were completed. During the outage, which was exceptionally complex both in view of its scope and matter as well as the number of external contractors, all verifications, maintenance work and projects in the area of technological upgrading were completed. The operational results are reflected also in the positive business result which exceeded the budgeted figures. These are the results which remain, together with our commitment to permanent improvement, our challenge in the future.

The effects on the environment, measured by the plant and external authorised institutions, were below the administrative limits in 2009. The positive assessment of the external audit of the NPP quality system in compliance with ISO 14001 standards, proves a responsible stance of the plant to the environment. The audit demonstrated a respectful attitude of NPP staff towards the environment.

Since the completion of the outage in May, there has been the 24th fuel cycle in the plant, the fourth 18-month cycle so far, which will end in autumn 2010 with the beginning of the new outage. An uninterrupted operation between the two cycles is our permanent challenge and is globally considered an exceptional achievement.

The plant continues to be oriented towards continual technological upgrading; therefore the 2010 outage will include several significant replacements and modernisations. At least two planned activities may have a greater impact on the outage due to their complexity. One of these is bimetal welding work on the pressure vessel, entailing work inside a radiologically controlled area; therefore, in addition to logistically demanding preparatory work, careful work planning in accordance with ALARA principles is required, to ensure that the doses received by workers are kept at the lowest possible level. The replacement of the stator on the main electric generator set is a challenge by itself due to its weight which exceeds 400 tons; therefore its main components casing, steel core and winding - will be delivered separately and are to be assembled in the plant before the outage. For all work during the outage the quality of work carried out remains our paramount concern to ensure safe and reliable operation of the plant during the following fuel cycle.



SUMMARY REPORT

The NPP's output in 2009 was 5,738.81 GWh of gross electric power at the generator output, or 5,459.72 GWh of net electric power. This annual production was by 1.11 percent higher than the planned figure (5,400 GWh). The availability factor was at the level of 91.23 percent while the capacity factor was at 93.58 percent.

The annual outage duration was 32 days, from 1st April 2009 (main generator switch disconnected) until 3rd May 2009 (electric power grid synchronisation). All planned work was completed during the outage and several modifications and upgrading (32 equipment modernisations) were carried out. The state of the inspected equipment was assessed as good, which is together with technological modernisation a good platform for safe and reliable operation during the 24th fuel cycle, which is to end in October 2010. The outage was extremely demanding both concerning its scope and the nature of modifications performed. In addition to own staff, there were approximately 2000 external contractors from 34 companies.

There were no unplanned shutdowns or major reductions of power during the year, except on 10th May, when a short-term reduction from 92 percent power to 65 percent occurred during the testing of the new programmable digital electro hydraulic turbine control system.





ENVIRONMENTAL IMPACT

NPP carries out radioactive measurements of the waste water discharges into the River Sava and emissions from the ventilation system into the air. An extensive programme of radiation surveying is carried out by NPP and external authorised institutions in the surroundings and from samples taken from the surroundings, in particular in the area around NPP within a distance of 12 kilometres. In addition, there are 13 automatic radiation survey stations located in the vicinity of the power plant which can detect any change in the natural radiation due to precipitations as well as potential changes due to the nuclear facility. The River Sava is monitored downstream for 30 kilometres from the plant.

The objective of the radiation monitoring is to monitor the plant operations and assess the impact on the surroundings and the local population. This is also the basis for verifying compliance with legal limits.

The effects on the population are so low that they are practically immeasurable. However, they can be calculated by models for the most exposed groups of the population and the annual dose can be compared with the dose received due to natural and other radiation sources. The assessment of an individual dose received by a reference critical group (an adult receiving the highest doses and whose food originates exclusively from locally grown food and fish) shows that the annual dose of such an individual so far has been approximately 1 μ Sv or that it is less than 0.1 percent of the dose on average received by a person due to natural sources of radiation (approximately 2,500 μ Sv). The results of measurements taken are dealt with in detail in a special report for 2009, prepared for NPP by the *Jožef Stefan* Institute together with the Institute for Occupational Safety, and the *Ruđer Bošković* Institute.

LIQUID RADIOACTIVE DISCHARGES

Wastewater may contain fission and activation products. In 2009 the activity of fission and activation products (excluding tritium H-3, carbon C-14 and alpha particle emitters) amounted to less than 0.07 percent of the annual limit for liquid discharges. The activity of discharged tritium was approximately 16 percent of the prescribed annual limit. Tritium is a hydrogen isotope found in water and, in spite of being more active than other contaminants, it is less important due to its low radiotoxicity.

The plant observed technical norms which require that in any (although brief) discharge of such wastewater the concentration of radioactivity in the channel does not exceed the prescribed limits.

DATA ON RADIOACTIVE LIQUID DISCHARGES IN THE YEAR 2009

RADIOACTIVE SUBSTANCES	ANNUAL LIMIT	PERCENTAGE OF THE LIMIT
Fission and activation products	100 GBq	0.066%
Tritium (H-3)	45 TBq	16.3%

RADIOACTIVE RELEASES INTO THE ATMOSPHERE

The annual dose limit of 50 μSv in a 500-meter distance from the reactor is checked monthly for the release into the air by calculating a

dose that could have been received by a person at such distance in one year due to external and internal radiation. The least favourable monthly average rarefaction values and releases near the ground are taken into account for individual wind directions. The result for 2009 was 0.82μ Sv (1.6 percent of the annual limit).

DATA ON RADIOACTIVE RELEASES INTO THE ATMOSPHERE IN 2009

ENVIRONMENTAL MPACT

RADIOACTIVE SUBSTANCES	ANNUAL LIMIT	PERCENTAGE OF LIMIT
Fission and activation gases (total)	doza < 50 μSv	0.09%
lodine (I-131 and others)	18,5 GBq (equivalent l-131)	0.085%
Dust particles (cobalt, caesium, etc.)	18.5 GBq	0.0036%

The plant's technical specifications were taken into account, therefore the current radioactive concentrations in the air/dose rate within a 500-metre distance from the reactor did not exceed the prescribed value.

MEASUREMENTS OF THE RIVER SAVA AND GROUNDWATER

Prescribed measurements of temperature, flow rate and oxygen concentration in the River Sava, and monthly measurements of biological and chemical oxygen consumption were carried out.

Not more than a quarter of the Sava flow can be diverted for power plant cooling. The increase in temperature of the River Sava after mixing did not exceed the permitted limit of 3 °C.

Groundwater is regularly inspected by NPP who constantly measures the ground water level and temperature in three boreholes and two locations on the River Sava and, on a weekly basis, in ten boreholes in the Krško-Brežice fields. The conditions remain unchanged; however, a slight rise of the groundwater level was detected which was due to precipitations.

DATA ON RADIOACTIVE WASTE AND SPENT NUCLEAR FUEL

In 2009, 103 cases of radioactive waste were generated to a total volume of 28.7 m³. The overall volume of radioactive waste stored in the interim storage as on 31 December

2009 was 2,208.70 m³, while the total activity was approximately 20 TBq. The storage is approximately 90 percent full. The waste volume in the interim storage was slightly decreased due to compression and shipment of waste abroad for incineration.

The spent fuel storage pool contains 929 spent fuel elements from the previous 23 fuel cycles. The overall mass of spent fuel material is 377 tonnes.

ENVIRONMENTAL MANAGEMENT AND COMMUNAL WASTE

In 2009 an ISO 14001 environmental management standard was implemented. Since the certificate is granted, the system is checked regularly on an annual basis by an external certification organisation. The 2009 audit was carried out on 22 and 23 December.

In line with the environment management system, waste separation practice was introduced. The volume of mixed communal waste was cut down by a half in 2009, which meant an increase by the same volume of collected separated waste.

A special waste water treatment plant is used for waste water. Measurements of pH, temperature, nonsoluble substances, chemical and biological use of oxygen at the outlet of the waste water treatment plant are taken.

MAINTAINING AND IMPROVING HIGH LEVELS OF NUCLEAR SAFETY

NPP pays special attention to ensuring and checking the execution of regulations and standards for nuclear technology, as well as other modern technologies in project solutions (equipment upgrading), operation and maintenance activities, the purchasing process and other activities which contribute to safe plant operation and the safety of the population. We are committed to on-going improvement, professional work and personal growth. Our mission is performed through independent review, on-going improvement of human performance and safety culture, critical self-assessment of results achieved, constant comparison with the best comparable facilities in the world, by learning from both in-house and foreign operating experience, and ongoing plant assessment in terms of plant operation safety and stability.

Due to its specific nature, NPP took an especially cautious stand towards the environment at an early stage of the project (extensive research concerning its location prior to a final decision, strict respect of standards during construction). During the plant start-up and its operation, independent monitoring of the effects on the environment was put into action (radioactive releases into water and emissions into the air, and nuclear fuel and hazardous waste management). A Protection and Rescue Plan (NZIR) for emergency events was prepared, detailing the organisation, measures and means of emergency management when there is a potential danger of radioactive effects on the environment. Care for the environment has always been a special concern of the plant's business policy. In order to assess and improve the NPP practices concerning the environment, the plant implemented the ISO 14001 standard, internationally the most widely recognised environmental management system.

Special consideration is paid to emission control. The chemistry laboratory, as evidence that it is competently qualified to carry out plant operations monitoring, has acquired and has maintained accreditation for measuring liquid and gaseous discharges from NPP.

In October an operative exercise in the event of an emergency was carried out in NPP. The exercise was carried out as a regular annual verification of NPP readiness in the event of an emergency in NPP. NPP, the Slovenian Nuclear Safety Administration (SNSA) together with other state and regional institutions took part in the exercise. The coordination was smooth and efficient. This proves that the plant is ready in the event of an emergency.

EVELS

The plant was paid a visit by the representatives of the Slovak plant *Slovenske elektrarne* and the Hungarian plant *Paks* for specialist training, and the French EDF for chemical processes, and the representatives from Lithuania for nuclear fuel handling.

SELF-ASSESSMENT

NPP uses various tools to improve nuclear safety. Special emphasis has been laid on implementing self-assessment as one of the key elements in achieving process improvements and in the objectives set. Self-assessments involve the evaluation of programmes, processes and lines of work in NPP. This includes the comparison of existing activities with executive expectations, best industrial standards and regulatory requirements to detect less apparent deviations or trends. Early correction of negative deviations or trends prevents the development of more acute problems which could seriously affect power plant safety, operational reliability or compliance with regulatory reInterdisciplinary focused self-assessment related to the NPP's fire protection was carried out to detect the deviations and negative trends in the fire protection process and identify good practice to be used in other processes in NPP. This included the verification as to how regulatory requirements are met, fire protection modification, fire protection system maintenance, training, general housekeeping, surveillance tests and walkdowns, preparatory measures in the event of an emergency and fire protection programme organisation.

The results of the interdisciplinary focused self-assessment showed that the plant's fire protection process is well defined; however, it can be improved. In order to achieve and maintain a high level of fire safety, the documentation should be modernised and harmonised in accordance with the new regulations, the fire-fighting plan should be modernised and extended to the entire NPP area, the preventive maintenance plan extended to all major fire protection systems and staff training responsible for fire protection advanced.

MAJOR TECHNOLOGICAL UPGRADING AND MODERNISATION

In 2009 we continued with technological upgrading during normal plant operation and during outage. Major modifications included:

TURBINE CONTROL AND PROTECTION SYSTEM REPLACEMENT (TURBINE CONTROL AND SUPERVISION)

The old digital electro hydraulic turbine control system (DEH) was replaced with a new programmable digital electro hydraulic (PDEH) system manufactured by the original supplier.

The installation of the new PDEH system included the replacement of the turbine protection system the emergency trip system (ETS), and the moisture separator reheater (MSR) control system, as well as removal of monitoring, control and testing of twelve extraction steam (EX) valves from manual control panel behind MCB section A to the PDEH Human Machine Interface platform.

All planned start-up tests were successfully completed during the plant start-up and/or while restoring the plant to 100 percent power.

RELOCATION OF THE 110-KV UNIT FIELD

A complete 110-kV unit field was installed into the new building in the switchyard, which included the installation of a new 110-kV switch block and its pertaining equipment, laid down all low-voltage control cables, and laid down and connected a new 110-kV cable.

The project included the installation of a new alarm panel with new switches for the 100-kV field control and new signalisation. The secondary equipment (field computer, protective relay, meter, connection with the main control room) was tested and prior to the new field start-up a high-voltage test of the new 110-kV cable connection was also tested.

During outage ecologically disputed old low-pressure oil 110-kV cable was removed, the old switchyard dismantled and old low-voltage cables were removed.

NEW INDEPENDENT LINE FOR REFUELLING WATER STORAGE TANK CLEANING

To facilitate independent cleaning of the refuelling water storage tank, a new cleaning line with a filter and demineraliser with pertaining piping and indicator was installed. The new line will also enable spent fuel pit cleaning. This will result in lower doses per work received during the water tank cleaning operation.

RELAY PROTECTION OF GENERATOR-TRANSFORMER BLOCK REPLACEMENT

The modification entailed the replacement of the old relay protection of the generator and transformers. The old electro mechanical protection was replaced with a modern one containing numeric protective elements. The new relays are installed into the redundant cabinets in the main control room. An additional current transformer with 21-kV generator outlet and an additional voltage transformer to the 21-kV bus for ground fault protection had to be installed. Furthermore, all required work to ensure 100 percent stator protection was carried out.

A NEW INVERTER AND A PROCESS CONTROL SYSTEM SUPPLY **BATTERY**

The aim of the modification was to ensure uninterrupted power supply source for the new PDEH system for turbine control and supervision with sufficient reserve to provide power supply for other process computers and controllers used for system control not vital for the system safe shutdown. An additional building with two rooms was built on the lower elevation of the turbine building. The first room houses a 220-volt battery with a capacity of 1500 Ah, while the second one contains two UPS units with the outlet power of 20 kVA and electric distribution boxes (230 V AC and 220 V DC).

REPLACEMENT OF TURBINE **SUPERVISORY INSTRUMENTATION**

The new turbine supervisory instrumentation system is based on a Bently Nevada 3500. The sensors were installed onto relevant locations around the bearing, rotor and casing and connected with special cables to the new local units. The number of parameters remains the same (vibration, extension, eccentricity, etc.); the responses and actions also remain unchanged. The modification is adjusted to the turbine digital electro hydraulic (DEH) system replacement project.

The essential change is the transfer of the direct protection function to the new DEH system. Turbine protection - the rotor position is now by means of PDEH configuration with a double number of measuring channels. The supervisory equipment is in the turbine building. The new supervisory instrumentation is connected to the alarm system (alarming the state of equipment and systems) and the main control panel via a new speed indicator display (independent PDEH indication).

SEISMIC PROTECTION OF THE POLAR CRANE BRIDGE AND TROLLEY

A permanent polar crane trolley seismic security device was installed, thus ensuring that no derailing occurs during a seismic event.

The horizontal movement of the polar crane bridge was limited to prevent its derailing due to seismic effects and thus secondary load bearing capacity of the crane bridge front girders and the crane rail girders to accommodate the horizontal seismic load was increased.

REPLACEMENT OF BLOWDOWN SYSTEM SAMPLING PANEL

The old sampling panel was replaced with a new one. The new panel is a closed-type panel made of stainless steel. The relevant transfer pump and transfer tank were also replaced at the same time.

REPLACEMENT OF AIR CONDITIONING EQUIPMENT IN THE ROOMS WITH TURBINE PDEH CONTROL AND SUPERVISION SYSTEM AND THE TELEPHONE SWITCHBOARD

The modification of out-of date system had to be replaced due to numerous pieces of equipment and increased volume of heat generated by the equipment installed into the room following the modification of the turbine PDEH control system. The new ventilation system ensures independent operation of two air-conditioning devices and ensures the operation of only one unit in the event of failure or maintenance of the other unit. In the room with the PDEH control system and telephone switchboard a contemporary air distribution system was installed with modern diffusers and gratings at air inflow and outflow.

MAJOR TECHNOLOGICAL UPGRADING AND MODERNISATION

MAJOR MAINTENANCE ACTIVITIES AND INSPECTION OF PRESSURE BOUNDARIES Appropriate inspection, maintenance and upgrading ensure the operational status of equipment. Maintenance falls into the areas of preventive maintenance, carried out at specific intervals defined in programmes, predictive maintenance, which is used for establishing the status of equipment (diagnostics), and corrective maintenance, related primarily to equipment not crucial to the availability and safety of the power plant.

Corrective measures to important equipment which is part of the preventive maintenance programme are followed by a detailed root cause analysis and if necessary the preventive maintenance programme is revised accordingly.

The major maintenance activities were carried out mainly during the outage, while some were carried out during plant operation. The majority of these activities were performed in line with preventive maintenance plans. Regular standard work was carried out during the outage, including: overhaul and revision of the high voltage and low voltage motors, switches and other electrical equipment; instrumentation gauging; non-destructive method inspection of equipment degradation caused during operation; overhaul of valves, ventilation systems and other mechanical equipment, overhaul of the diesel set; main generator overhaul; inspection of steam generator tubes by ECT method.

Major work included: reactor head penetration inspection; control rod guide tube inspection; replacement of piping on the secondary side, universal card replacement in the reactor protection system on A train, testing of digital data collection for the testing of the control rod drop in the reactor; replacement of one reactor building pressure transmitter; cleaning, visual inspection of interior, ultrasonic measurements of the wall thickness and pressure testing of underground tanks for fresh and waste turbine oil; opening and testing all turbine control valves.

The results of the inspection by means of non-destructive method proved that the integrity of the pressure boundaries is perfect, as there was not one indication as a result of degradation during plant operation.

In accordance with the inspection programme of the secondary system components due to erosion and corrosion, no condition requiring special corrective measures was detected. Other maintenance work was carried out during the plant operation in accordance with the planned activities programme. No major significant corrective work was performed during plant operations which could jeopardise the safety or availability of the power plant.

generator outlet was 5,738.81 GWh of gross electricity or 5,459.72 GWh net electric power; the output achieved exceeded the planned figure (5,400 GWh) by 1.11 percent. The availability factor was 91.23 percent and the capacity factor was 93.58 percent.

Net energy produced:

- 1. Turbine valves test
- . the test

FUEL

SERVICE AND EQUIPMENT PURCHASING

Cooperation with experienced business partners is one of the crucial factors having a direct impact on safe and reliable plant operation. Non-responsiveness of American suppliers has been going from bad to worse with respect to often very specific small value enquiries. The problem of out-of-date parts has also been worsening; we have been trying to overcome it by equipment replacement. One of the attempts to overcome the problem is also our joining the Proactive Obsolescence Management Plan with PKMJ Technical Services. NPP has entered into long-term agreements on business cooperation with local strategic business partners, in particular those who render important and continual services for NPP, thus ensuring high quality of services and their timely completion at competitive prices.

PERFORMANCE

INTERNATIONAL COOPERATION

EXPERIENCE OF OTHERS – GUIDANCE FOR OUR WORK

At NPP we are aware of the importance of joining international organisations and the international control of our operations. It is the only way to achieve internationally comparable operating and safety results.

WANO

All nuclear facilities in the world are members of the World Association of Nuclear Operators (WANO). NPP joined this organisation as early as 1989 when the organisation was established. Its aim is to promote the highest standards of operational safety, availability and excellence of nuclear power plants. During the past 20 years since its establishment, the organisation has performed their expert inspections with all commercial nuclear operators world-wide. WANO supports several programmes for sharing information and the promotion of communication, mutual comparison and copying of best practice and solutions among its members.

INPO

From as early as 1988 NPP has been a member of the Institute of Nuclear Power Operations (INPO) in the USA. Its primary objective is to increase the level of nuclear power plant safety and reliability. All American organizations that operate nuclear power plants are INPO members. Its membership extends both to nuclear operating organizations in other countries, as well as to the manufacturers and designers of nuclear facilities.

IAEA

and assess their operational safety.

NUMEX

For over ten years, NPP has been a member of the NUMEX organisation (Nuclear Maintenance Experience Exchange) engaged in the exchange of experience in the sphere of nuclear power plant maintenance.

The International Atomic Energy Agency (IAEA) is an independent intergovernmental organisation which operates within the United Nations Organisation. Its primary objective is to help members in planning and using nuclear technology for various peaceful purposes. These include electricity generation and technology / know-how transfer in this field. The IAEA develops safety standards that promote achievement of a high level of safety in the use of nuclear energy and in protection of the population from ionising radiation. The organisation operates on the basis of various programmes such as control over nuclear material, nuclear technology application, nuclear energy, nuclear safety and technical cooperation. As part of these programmes, the IAEA organises OSA-RT (Operational Safety Review Team) missions which involve visiting power plants in order to inspect

EPRI

EPRI – the Electrical Power Research Institute – is a non-profit making and independent organisation for research in the area of electricity production and the protection of the environment. It was established in 1973 in support of the development of the electrical industry. The Institute currently covers all aspects of production, transmission and use of electricity.

NRC

The NRC (Nuclear Regulatory Commission) is an independent agency in the USA in charge of safety and protection of the population against the effects of radiation from nuclear material, reactors and faciliand the Jožef Stefan Institute (IJS), NPP is a member of a number of programmes which give access to information and literature on various relevant fields.

PWROG

PWROG (Pressurized Water Reactor Owners Group) is the association of all the pressurized water reactor operators and offers various programmes related to improved equipment, optimisation of technical specifications, reduced number of unplanned shutdowns, increased power of the plant, simplification of the plant systems, the manufacture and use of nuclear fuel, optimisation of technical specifications, analyses by contemporary programmes and

NPP ACTIVITIES IN 2009

Until October, the President of the NPP Management Board chaired the Governing Board of the WANO Paris Centre, made up of representatives of all member countries of the Centre. We have had a representative in the WANO Paris Centre since 2004, holding the function of WANO Peer Review Programme Manager.

NPP has had an active part in WANO ganisations.

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and INPO for several years now. We have had three missions of WANO Peer Review so far, while our representatives took part in 30 such missions world-wide. Within the framework of Technical Assistance Missions, NPP received 27 such missions covering all activities of the plant. Our representatives regularly take part in specialist training programmes organised by these or-

Due to excellent results, our plant has become a model plant for other nuclear facilities and a source of good experience in different fields of work. In line with this and within the WANO organisation, NPP was visited by Slovakian plant representatives and Hungarian power plant Paks on the subject of specialist training, French EDF on the subject of chemistry and Lithuanian Vatesi on the subject of nuclear fuel handling.

We took part in international specialist WANO Peer Review missions, including visits to the Belgian Doel power plant on the subject of chemistry, the Spanish Confrentes power plant in the field of engineering, and the German Isar power plants on the subject of management. Within Technical Assistance Missions our representatives took part in the mission related to operations and surveillance configuration (Borselle, the Netherlands) and radiological protection (Hunterston B, Great Britain), while we received a mission in the field of nuclear safety assessment.

As part of our cooperation with IAEA, we have organised three OS-ART and some other missions. Their inspectors, who safeguard nuclear fuel, are our regular visitors.

NPP takes an active part in some major areas of the EPRI Institute, including:

- equipment maintenance in nuclear power plants (NMAC

 Nuclear Maintenance Application Centre),
- improvement, procurement and qualification of equipment (PSE – Plant Support Engineering),
- non-destructive tests and research (NDE – Non-Destructive Examination),
- exchange of experience in application of programmes for accident analysis (MAAP – Modular Accident Analyses Program User Group).

Our plant participated in the PWROG annual conferences, which are specially organised for nuclear power plants in European countries. Furthermore, as a member of NUMEX, NPP took an active part in the exchange of information in the field of maintenance.

INTERNATIONAL COOPERATION

TRAINING

Active professional training was carried out to ensure that training programmes were well prepared and executed, thus contributing to a high degree of personnel expertise, subsequently resulting in a higher level of safety and reliability of the power plant operation.

These programmes were largely prepared and executed in-house and partly in collaboration with external institutions, both national and foreign.

NPP training programmes were prepared and executed in accordance with the annual plan, defined on the basis of the needs established in collaboration with heads of individual organisational units.

TRAINING OF OPERATING PERSONNEL

Professional training programmes for operating personnel were prepared in line with relevant legal regulations, internal procedures and the two-year plan. The initial training of licensed operators continued according to the programme; this included the completion of four new reactor operators training. All four were successful at the exams run by a URSJV expert commission.

At the same time, initial training of 12 candidates was started, after having completed successfully the first training phase - Theoretical Basis - in 2009, and thus started the second phase - Systems and Plant Operation; this training stage entails, in addition to lectures, practical exercises on the simulator and hands-on training within the technological part of the plant. In November, the training of the second generation of 18 operators and newly employed graduate engineers was started in collaboration with the Training Centre for Nuclear Technology (ICJT).

Continuous professional training of licensed personnel was conducted in accordance with the approved outline programme and NPP internal procedures. The training was conducted through classes and simulator scenarios, during four weekly segments, attended by all operations crews and other licensed personnel.

In the final annual session, 18 candidates successfully passed exams for licence renewal, of which six were for reactor operator, seven for senior reactor operator and one for shift engineer. Four candidates successfully passed the exams for the first award of senior reactor operator.

The ongoing professional training for equipment operators was conducted in parallel with the training for licensed personnel, in four weekly training sessions. The programme focused on hands-on training by using system operation procedures in the technological building or in the classroom which was actively linked with the fullscope simulator.

The operating personnel also attended practical training in three groups, including training for the personnel in charge of refuelling which was aimed at preparing all participants for safe and first-class performance of this important activity. Other training focuses on refreshing and upgrading of knowledge and skills needed by equipment operators in their work.

Three groups from Production and Maintenance departments attended the hands-on course for refuelling staff, whose aim was to prepare the candidates to ensure safety and high quality in performing this activity.

Prior to outage, as practised in the past, training of staff of various organisational units connected with refuelling activities was conducted, and an internal refresher course was carried out for staff taking part in refuelling.

In addition to several other changes, an extensive modification of the turbine control and surveillance system and the modification of cooling units for cooling the safety equipment buildings was carried out.

TRAINING FOR PERSONNEL IN MAINTENANCE AND OTHER SUPPORT FUNCTIONS

The professional training of technical personnel includes courses whose aim is for candidates to acquire or refresh the legally required general and specialist skills needed for performing maintenance and supporting functions.

2009.

TRAINING

Within the framework of initial training for technical personnel, there were two courses in the fundamentals of nuclear power plant technology (OTJE). In line with regular practice, these two courses were conducted in collaboration with the Training Centre for Nuclear Technology. The OTJE courses were conducted in two parts - in the first part theoretical fundamentals were covered, while the second part focused on systems and operations of the power plant. A total of 25 NPP staff attended the training in

Training of maintenance personnel continued in 2009 with the programmes of specialist and legally required training, which were prepared on the basis of matrices of required qualifications. Some courses were conducted in cooperation with external institutions and partly in the Maintenance Personnel Training Centre in NPP and partly in NPP technological units. The training was conducted, as the practice has become, by engaging, at the training preparation and execution stage, in addition to own specialist staff, mentors of practical training from individual Maintenance departments.

In 2009 we continued with specialist training courses, intended for outage activities. Along with NPP staff, external contractors' personnel attended the training, which resulted in higher work quality and better work harmonisation.

OTHER LEGALLY PRESCRIBED AND GENERAL TRAINING

The implementation of established programmes of initial and refresher courses related to legally prescribed skills, such as safety and health at work, fire protection, hazardous substances, protection and rescue plan (NZIR), etc. were continued.

The initial and refresher training in radiation protection was continued according to legal requirements.

At the end of the year an extensive NZIR drill was conducted, supported by full-scope simulator.

In addition, other courses were carried out for other departments within the power plant, intended to update the staff on new legislation, introduce innovations in the area of production processes, and continued with general courses in the areas of computer literacy and foreign languages. Prior to outage, an extensive general programme of courses was conducted for external contractors, attended by 2004 people. The majority of these (1420) attended the general training programme, the programme related to radiation protection (371 individuals), and 213 work group leaders were trained.

SUMMARY OF THE 2009 FINANCIAL REPORT

In accordance with the Companies Act (ZGD-1) and the Articles of Association of NPP, a summary of the Financial Report, which is part of the Annual Report of NPP for 2009, is given below. The summary includes the main characteristics of business operations in 2009 and consolidated fundamental financial statements. The full versions of fundamental financial statements are presented in the NPP Annual Report for 2009 prepared in accordance with the Agreement concluded between the Government of the Republic of Slovenia and the Government of the Republic of Croatia on regulating the status and other legal issues related to investments in Krško Nuclear Power Plant, its utilisation and decommissioning (Intergovernmental Agreement), the Articles of Association of NPP, the Companies Act (ZGD-1) and Slovenian Accounting Standards (SAS).

The Annual Report of NPP for 2009 was submitted to the organisation authorised to process and publish the data the day after it had been accepted at NPP's General Meeting, and is published on its website.

In 2009 the plant performed successfully and all economic objectives set in the business plan were achieved. Our two partners were supplied with 5,459 GWh of electricity, which is 59 GWh more than planned, at a competitive price which was slightly lower than the budget price.

The revenue amounted to a total of €153,821 thousand. The majority of this revenue was from electricity supplied to the partners, while the minor amount of the operating revenue was from auxiliary activities and other business income. In addition, unplanned financial revenue was generated from the interest on deposits made to banks and the revaluation of receivables and debts to preserve their value.

Expenses amounted to €153,821 thousand. Their structure is illustrated in the graph below.

BALANCE SHEET AS AT 31 DECEMBER 2009

AS AT 31 DECEMBER 2009 in the					
BALANCE SHEET	31/12/2009	31/12/2008			
ASSETS					
A. LONG-TERM ASSETS	420,275	424,924			
Tangible fixed assets	419,265	423,679			
Investment property	636	669			
Long-term financial investments	374	576			
Long-term operating receivables	-	-			
B. CURRENT ASSETS	95,051	92,659			
Inventories	76,579	78,437			
Short-term financial investments	4,723	1,427			
Short-term operating receivables	13,737	12,785			
Cash	12	10			
C. SHORT-TERM DEFERRED EXPENSES AND ACCRUED REVENUE	244	235			
TOTAL ASSETS	515,570	517,818			
Off-balance sheet assets	19,614	9,002			

BALANCE SHEET	31/12/2009	31/12/2008
EQUITY AND LIABILITIES		
A. EQUITY	439,515	439,515
Called-up capital	353,545	353,545
Revenue reserves	88,675	88,675
Retained earnings	(2,705)	(2,705)
Net profit or loss for the financial year	-	-
B. PROVISIONS AND LONG-TERM ACCRUED COSTS AND DEFERRED RE	EVENUE 4,597	4,404
Provisions for jubilee benefits and termination benefits	3,734	3,498
Other provisions	863	906
C. LONG-TERM LIABILITIES	33,227	39,893
Long-term financial liabilities to banks	32,921	39,568
Long-term operating liabilities	306	325
Č. SHORT-TERM LIABILITIES	38,021	33,802
Short-term financial liabilities to banks	6,647	6,647
Short-term operating liabilities	31,374	27,155
D. SHORT-TERM ACCRUED COSTS AND DEFERRED REVENUE	210	204
TOTAL EQUITY AND LIABILITIES	515,570	517,818
Off-balance sheet liabilities	19,614	9,002

INCOME STATEMENT FOR THE YEAR ENDED 31 DECEMBER 2009

INCOME STATEMENT I. OPERATING REVENUE II. OPERATING EXPENSES III. OPERATING PROFIT OR LOSS FROM OPERATIONS (I – II) IV. FINANCIAL REVENUE V. FINANCIAL EXPENSES VI. OPERATING PROFIT OR LOSS FROM FINANCING (IV – V) VII. OPERATING PROFIT OR LOSS FOR THE PERIOD (III + VI) VIII. CORPORATE INCOME TAX

IX. NET OPERATING PROFIT OR LOSS FOR THE PERIOD (VII – VIII)

CASH FLOW STATEMENT FOR THE YEAR ENDED 31 DECEMBER 2009

CASH FLOW STATEN	IENT

- I. CASH FLOWS FROM OPERATING ACTIVITIES
- 1. Cash receipts from operating activities
- 2. Cash disbursements from operating activities
- 3. Net cash from operating activities (1 2)
- II. CASH FLOWS FROM INVESTING ACTIVITIES
- 1. Cash receipts from investing activities
- 2. Cash disbursements from investing activities
- 3. Net cash from investing activities (1 2)
- **III. CASH FLOW FROM FINANCING ACTIVITIES**
- 1. Cash receipts from financing activities
- 2. Cash disbursements from financing activities
- 3. Net cash from financing activities (1 2)
- IV. CLOSING BALANCE OF CASH (VI + V)
- V. Net cash inflow or outflow for the period

+

VI. Opening balance of cash

in thousand EUR

2009	2008
153,361	140,554
151,606	138,791
1,755	1,763
460	792
2,215	2,555
(1,755)	(1,763)
0	0
0	0
0	0

in thousand EUR

2009	2008
168,705	158,069
120,393	127,419
48,312	30,650
26	3,125
(39,411)	(21,440)
115,625	23,830
124,524	33,052
(8,899)	(9,222)
12	10
2	(12)
10	22

STATEMENT OF CHANGES IN EQUITY FOR THE YEARS 2009 AND 2008

8

							in thousand Eon
EQUITY COMPONENTS	CALLED-UP CAPITAL		REVENUES RESERVES		RETAINED EARNINGS	NET PROFIT OR LOSS FOR THE FINANCIAL YEAR	TOTAL EQUITY
	Called-up capital	Legal reserves	Statutory reserves	Retained net profit	Retained net loss	Net profit	
OPENING BALANCE - 1/1/2009	353,545	35,354	53,321	-	(2,705)	-	439,515
Movements to equity	-	-	-	-	-	-	-
Movements within equity	-	-	-	-	-	-	-
Allocation of net profits based on the resolution of the management and the supervisory board	-	-	-	-	-	-	-
CLOSING BALANCE - 31/12/2009	353,545	35,354	53,321	-	(2,705)	-	439,515
OPENING BALANCE - 1/1/2008	353,545	35,354	53,321	-	(2,705)	-	439,515
Movements to equity	-	-	-	-	-	-	-
Net profit or loss for the financial year	-	-	-	-	-	-	-
Movements within equity	-	-	-	-	-	-	-
Allocation of net profits based on the resolution of the management and the supervisory board	-	-	-	-	-	-	-
CLOSING BALANCE - 31/12/2008	353,545	35,354	53,321	-	(2,705)	-	439,515

in thousand EUR

In accordance with the Agreement concluded between the Government of the Republic of Slovenia and the Government of the Republic of Croatia on regulating the status and other legal issues related to investments in the Krško Nuclear Power Plant, its utilisation and decommissioning, and the Articles of Association, both having entered into force on 11th March 2003, NPP is organised as a limited liability company. The bodies of the company, having parity membership, are the General Assembly, the Supervisory Board and the Management Board.

The equity capital of NPP is divided into two equal business shares owned by the members GEN energija, d. o. o., Krško and Hrvatska elektroprivreda d.d., Zagreb. NPP generates for and supplies electricity exclusively to the members; it is their right and obligation to take 50 percent of the total available capacity and net electric power.

STABLE AND COMPETENT STAFF

NPP's strength is in its high organisational standard and stability of human resources coupled with a good educational structure. All staff are encouraged to pursue personal development and enjoy systematic training, both locally and abroad.

At the end of 2009 there were 624 employees, of which 47 percent had higher, high or university education, including four with a doctor's degree and 14 masters of science. The process of generation change is still continuing, through the process of staff retirement by those who are now leaving after being employed since the plant construction or at the start of plant operation. The 3.7% staff turnover is comparable with the figures from previous years. A total of 59 university and high-school graduates were recruited, mainly in technical and natural science. These newly recruited staff are being introduced through training and the programmed process of knowledge and experience transfer in technological processes.

The NPP organisational structure reflects contemporary standards of nuclear facility operators. Special attention is paid to the strengthening of vital functions of the organisation and to enhanced quality and efficiency of employees.

	Krško safety committee	President and member of management board	Committee for radiological safety and environmental protection		
Krško Technical operating operations	Engineering services	ل Quality and nuclear oversight	Finance	General administration	Purchasing
Operations -	Design changes	Quality system	Accounting -	General services	Purchasing international
Electrical — Maintenance -	Analyses and _ licensing	Quality _ control	Planning and - analysis	Legal matters	Purchasing local
Mechanical - Chemistry -	Process _ information	Independent safety engineering group	Financial administration	Personnel matters	
I&C _ Radiological _ protection	Nuclear _ fuel			Public _ relations	
Predictive – Industrial	Engineering _ support				
ISI _ programme		Security	Training	Business information system	
Civil -					
Storage facilities					

ORGANISATION CHART

ACRONYMS

ALARA NMAC As Low As Reasonably Achievable CHUG Checworks Users Group NDE DEH Digital Electro Hydraulic NPP ECT Eddy Current Testing NRC EDF Électricité de France ELES **Electric Power System of Slovenia** NZIR EPRI **Electrical Power Research Institute** ETS Emergency Trip System Team FRI OTJE Fuel Reliability Indicator IAEA International Atomic Energy PDEH Agency ICJT Training Centre for Nuclear PSE Technology **J&C PWROG** Instrument and Control IJS Jožef Stefan Institute **SNSA** INPO

Institute for Nuclear Power Operations ISO

International Organisation for Standardization

MAAP Modular Accident Analyses Program User Group MCB Main Control Board

Nuclear Maintenance Applications Centre Non-Destructive Examination Krško Nuclear Power Plant Nuclear Regulatory Commission NUMEX Nuclear Maintenance Experience Exchange

Protection and Rescue Plan **OSART**

Fundamentals of Nuclear Power Plant Technology

Programmable Digital Electro Hydraulic

Plant Support Engineering

Pressurized Water Reactor Owners Group

Slovenian Nuclear Safety Administration SRS

Slovenian Accounting Standards UPS

Uninterruptable Power Supply

WANO World Association of Nuclear Operators ZGD **Companies Act**

- **Operational Safety and Review**

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