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Annual Report

1



ADDRESS BY THE MANAGEMENT BOARD

- IMPORTANT ACHIEVEMENTS IN 2013, CHALLENGES FOR 2014 SUMMARYREPORT
- 1.0 ENVIRONMENTAL IMPACT
- 2.0 MAINTAINING AND IMPROVING HIGH LEVELS OF NUCLEAR S
- 3.0 MAJOR TECHNOLOGICAL MODERNISATION
- 4.0 MAJOR MAINTENANCE ACTIVITIES AND INSPECTION OF PRES
- 5.0 PERFORMANCE
- 6.0 INTERNATIONAL COOPERATION
- 7.0 TRAINING
- 8.0 SUMMARY OF THE 2013 FINANCIAL STATEMENTS
- g.o COMPANYORGANISATION

ACRONYMS

	05
L.	og
	13
	17
SAFETY	23
	27
SSURE BOUNDARIES	33
	37
	43
	47
	51
	59
	63



# Dear reader,

In this 2013 Annual Business Report we once again evaluate the results of our business and operations, this time our 31st year of commercial operations in the Slovenian and Croatian electricity systems. Perhaps the most prominent mark of the past year is reaching a special milestone when all the programs enabling the basis for plant life extension until 2043 were implemented, the required conditions fulfilled and evaluations conducted. At the same time, the plant's operations were economical as well as at a high nuclear safety level and strictly respecting environmental limits.

The year 2013 confronted us with several challenges: carrying out the Safety upgrade program, a decision based on the belief that the mission and vision be reached by a new Code of safety and business ethics based on clearly defined methods of the conduct of the company and by promoting the awareness that quality and success begin with responsible conduct of every individual. Targets were set for the next five-year period, and strategies and action plans for their achievements were defined. The year was also marked by demanding and extensive preparations for the outage which, along with all its specialties, once again attested that our staff are distinguished by their merits to resolve effectively even the most complex and demanding predicaments.

The plant was again a competitive and reliable source of energy. We generated 5.03 billion kWh at a high availability level of the plant's safety systems.

The electric power output was lower by 5.3 percent than planned due to a slightly longer outage; nevertheless, NPP's business year ended within the framework of planned costs. The reason for the outage extension was the rectification of damage to the nuclear fuel. NPP's operational safety remained unaffected by this irregularity nor was there any negative impact to the environment. Nuclear safety was ensured at all times and remains so.

Our operations, supported by high nuclear industry standards, were upgraded with new safety solutions and investments in preventive maintenance to contribute to permanent nuclear safety enhancement as the highest priority of NPP business policy.

Major accomplished projects include: reconstruction of the switchyard as an essential contribution to reliable operations of the electric energy system in this part of Europe, installation and completion of the new power transformer for reliable transmission of full NPP's electricity output, installation of a new primary circuit temperature measuring system which reduces maintenance and exposure to radiation, installation of a Passive Containment Filtering and Venting System, and Passive Autocatalytic Recombiners for hydrogen concentration regulation in the containment. These are just a few of many technological solutions which are upgraded and modified every 18 months; they are increasing in number as well as in complexity and reliability.



Among the most remarkable achievements are finalised regulatory procedures which, subject to all the conditions having been maintained, enable the power plant's operations until 2043. The precondition for the plant life extension was the implementation of the Systems, Structures and Components Aging Management Program. Several tens of aging management programs were implemented, which require special operational, maintenance and inspection measures and procedures. Additional safety analyses showed that there was a large safety margin in NPP for the plant's operational life-span extension. Slovenian Nuclear Safety Administration approved the Safety upgrade program to be completed by 2018 and with this being one of the conditions for the following decades of the power plant operation. In addition, all periodic safety reviews requirements prescribed by Slovenian legislation were met. The second 10-year safety review is behind us when the Management comprehensively and systematically verified nuclear safety and the realisation of the action plans which include the readiness assessment in the event of a nuclear accident and their upgrading.

At the end of the year the annual external auditing by the certification organisation was carried out in NPP on the basis of the ISO 14001 environmental standard and BS OH-SAS 18001 occupational health and safety standard. The audit confirmed that in all our activities the provisions of all those international standards which are most widely used in the field of environment management and occupational health and safety, had been respected. This is yet another proof that the

environmental culture of our company is part of all and every activity and that we ensure a safe working environment by means of an effective occupational health and safety system.

The key part of our process is our staff and their health, dedication and focusing to work. These vital elements of growth and development have been encouraged by training to ensure that the new generations which have joined us in the last few years, as well as all those individuals who have been part of this power plant for decades, may broaden their knowledge which is a foundation for the future in every society.

Recognition of key factors of progress, successful completion of demanding programs and the results achieved in 2013 are the platform for the new business year in which we stay focused on stable, reliable, safe, competitive and long-term operations.



with two countries.

Stane Rožman President of the Management Board

### ADDRESS BY THE MANAGEMENT BOARD



This is also an opportunity to express gratitude to all who show your trust in our future power provision: to all employees for their dedicated work, to business partners for their expert work, and to the owners for their support and responsible decisions that they take in view of long-term development and the permanent value of energy generated by the Krško nuclear power plant in cooperation

Hrvoje Perharić Member of the Management Board

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It has been ten years since the Agreement between the Government of the Republic of Slovenia and the Government of the Republic of Croatia on regulation of status and other legal relationships relating to investments into the Krško Nuclear Power Plant, its exploitation and decommissioning and the Articles of Association entered into force. After decades of economic uncertainties, numerous status and management changes, Krško NPP finally stabilised their economic and status position. The Contract ensures stable resources for operations and technological modernisation. The plant generates and supplies electric power exclusively for the two partners: GEN energija and Hrvatska elektroprivreda. Our results have positive effects in the electricity market for both partners.

NPP's business year ended with costs within the planned framework, although the output was by almost five percent lower than the planned figure due to the unplanned spring shutdown and extended outage; namely, during the outage NPP was, after more than three decades of operations, for the first time faced with damage to the nuclear fuel elements. Our response to this was based on technical competence with a great amount of conservativeness, representative of the nuclear industry, ensuring at all times nuclear safety which has always been on top of the priority list. The ambitious corrective and preventive program for fuel condition rectification, and ensuring its integrity in the following fuel cycle was not only a professional challenge but also a logistic one entailing checking the international practices in a very short period of time, as well as providing analyses and ordering materials and services. The comparison of relevant international practices concerning this type of damage confirmed that all necessary actions had been taken effectively and more promptly than in other plants. During the outage all extensive planned maintenance and technological modernisation work was completed successfully, including the first two projects from the Safety upgrade program which ensure the integrity of the containment and thus safety of the environment even in the event of an unlikely severe nuclear accident. These were joint achievements of professional and enthusiastic work by the employees and our business partners.

At the end of year 2014 it will be four decades since the symbolic foundation stone was laid in Vrbina, thus marking the beginning of the fruition of the idea that nuclear energy generation will help in providing the ever increasing demand for electric power. For more that three decades now NPP's staff has been fulfilling expectations, providing a significant amount of safe and competitive energy, at the same time maintaining a responsible attitude to the environment. The compass points, carved in the foundation stone, my be interpreted as both a realistic as well as symbolic message, that it is vital that we know at every moment what is the direction of our path.



After the completed regulatory procedures concerning the plant lifespan extension, we entered the second part of its operational period; therefore, we drafted a new vision and set ambitious targets for its successful operations in the next five-year period together with the strategy for their achievement. In addition, we defined a new Code of safety and business ethics representing a summary and basic guidelines of our ethical and moral actions. In drafting key documents representatives of different disciplines and generations were included in relevant workshops. During the last decade - it could be named the period of generational exchange as senior staff was replaced due to their retirement - 250 young engineers and technicians joined the company. By systematic training organised by the power plant and together with domestic and international organisations, the employees gain specialist professional knowledge in the field of nuclear technology and work processes supporting the operations. Designing the key documents, which will serve as internal support for long-term operations of the plant based on the "bottom-up" principle, in addition to active participation by both the experienced staff as well as the young generation in this process, will add to the value of these documents and represent a good basis for achieving joint goals.

Year 2014 will be a year without an outage, although preparations for the next outage are already underway - including preparation of technological solutions dictated by ever increasing criteria of nuclear safety. A year without an outage enables greater output, planned at 5.9 billion kWh. Conditions for reaching this goal are high stability and reliable operation; these in turn will be ensured by day-to-day professional, focused and dedicated work by every employee; every day everything has to be done the right way.



ANNUAL REPORT 2013





In 2013 the plant's operation was safe and stable. However, the year was marked by the extended outage due to damage to the fuel elements and two unplanned shutdowns, for which reason the output was slightly below the planned figure. In February there was an automatic reactor trip caused by the main steam isolation valve closure, while in November we had a reactor trip due to a reactor protection alarm. The plant generated 5.04 terawatt hours of net electric energy, which was slightly less than the planned figure.

The plant began to implement the Safety upgrade program (SUP), required by the Slovenian Nuclear Safety Administration by their ruling and is one of the conditions for NPP's

ANNUAL PRODUCTION



NEK TARGET FOR 2013: ≥ 5 317 GWh TOTAL (PRODUCTION FROM THE START OF COMMERCIAL OPERATION): 143.01 TWh extended lifespan operation. Two modifications under the above mentioned program were carried out, i.e. the installation of Passive Autocatalytic Hydrogen Recombiners in the reactor building and the installation of the Passive Containment Filtering and Venting system. In addition, the second phase of the periodic safety review was finished in a timely manner. The plant submitted all the required documents to the Slovenian Nuclear Safety Administration, following which the same administrative body issued Krško NPP a new timely unlimited operating licence which allows Krško NPP technical operations for an additional 20 years subject to periodic safety review having to be conducted every 10 years in accordance with current valid legislation, and the Safety upgrade program being implemented by 2018.

ANNUAL REPORT 2013



TWh

During the regular outage of the plant some complex modifications were carried out, including: optimisation of the primary cooling system temperature measuring system,

extension of the system for fire detection in the technological part of the power plant, and the reconstruction of the 400-kV switchyard. The outage took 49 days due to the damage to the nuclear fuel, which is 13 days longer than planned.

# UNPLANNED



NPP's operation was safe and in accordance with the requirements set by the Slovenian legislation and international regulations and standards. The collective dose was slightly due to fuel leak.

# COLLECTIVE DOSE



FOR 2013: ≤ 0.75 ManSv

# OUTAGE DURATION



FOR 2013: ≤ 37 DAYS

ANNUAL REPORT 2013





## SUMMARY REPORT

REACTOR SHUTDOWNS

ANNUAL REPORT 2013

higher than planned mainly due to the optimisation of the primary cooling system temperature measurement system, and increased contamination in the primary cooling system

NPP carries out radioactive measurements of the waste water discharges into the Sava River and emissions from the ventilation system into the air. An extensive program of radiation surveying is carried out by NPP and external authorised institutions which measure samples in 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 changes in the natural radiation due to precipitations as well as potential changes due to the nuclear facility. The Sava river 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 critical reference 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 has been approximately 1 microsievert or less than 0.1 percent of the dose on average received by a person due to natural sources of radiation (approximately 2,500 microsieverts). The annual dose for NPP is limited to 50 microsieverts per person (at a distance of 500 m from the reactor or more) from air and water media. The results of measurements taken are dealt with in detail in a special report for 2013, prepared for NPP by the Jožef Stefan Institute together with the Institute for Occupational Safety, and the Ruđer Bošković Institute.

**1.0** Environmental Impact

ANNUAL REPORT 2013

# LIQUID RADIOACTIVE **DISCHARGES**

Wastewater may contain fission and activation products. The activity of fission and activation products (excluding tritium H-3, carbon C-14 and alpha particle emitters) amounted to 0.037 percent of the additional annual limit of activity for liquid discharges. The activity of discharged tritium was approximately 26 percent of the prescribed annual limit. Tritium is a hydrogen isotope found in water; in spite of being more active than other contaminants, it is less important due to its low radiotoxicity.

# DATA ON LIQUID RADIOACTIVE DISCHARGES IN 2013

RADIOACTIVE SUBSTANCES	ANNUALLIMIT
FISSION AND ACTIVATION PRODUCTS	100 GBq
TRITIUM (H-3)	45 TBq

The plant observed general and technical regulations which require that in no discharge of such wastewater may the concentration of radioactivity in the channel exceed the prescribed limits.

# **RADIOACTIVE RELEASES** INTO THE ATMOSPHERE

PERCENTAGE OF THE LIMIT

0.037% 26%

The annual dose limit of 50 microsievert is checked monthly for discharges into the air and water, for air in a 500-metre distance from the reactor 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 air rarefaction values and releases near the ground are presumed in the calculation of individual wind directions. The result for 2013 was 1.5 microsieverts (3 percent of the annual limit). More detailed data is given in the table below.

# DATA ON RADIOACTIVE RELEASES INTO THE ATMOSPHERE IN 2013

RADIOACTIVE SUBSTANCES	TOTAL ANNUAL LIMIT	DOSE	PERCENTAGE OF THE LIMIT	
FISSION AND ACTIVATION GASES (TOTAL)		0.16 µSv		
IODINE (I-131 AND OTHERS)		8.25E-03 µSv		
DUST PARTICLES (COBALT, CAESIUM, ETC.)	50 μSv	6.5E-o6 µSv	3%	
TRITIUM (H-3)		o.94 µSv		
CARBON (C-14)		ο.4 μSv		
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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.

# IODINE AIR EMISSIONS (IODINE LIMIT -EQUIVALENT TO I-131)



As the above chart illustrates, the effects on the environment in 2013 due to mechanical damage to the fuel elements in Krško NPP were unchanged. The dose at 500 metre distance from the reactor was 3% of the annual medicine.

limit, which is comparable to values of previous years. Iodine emissions were also below the additional operational limit values (0.59% of 18.5 GBq). The total annual air emission activity is comparable to a one-off use of radioactive iodine by a patient in contemporary

# **MEASUREMENTS OF THE SAVA RIVER AND GROUNDWATER**

In accordance with the environmental permit (OVD) concerning the water emissions and partial water permit measurements of temperature, flow rate and oxygen concentration in the Sava River, monthly measurements of biological and chemical oxygen consumption were carried out.

Due to unfavourable weather conditions during the summer months in 2013, NPP filed an application with the administrative body (ARSO) for increasing the permitted added temperature of the Sava River, from the permitted level of 3.0 °C to 3.5 °C. The application was granted for a specific period; consequently, the temperature of the Sava River due to operations by NPP was increased by not more than 3.0°C.

Groundwater is regularly inspected by the power plant who constantly measures the ground water level and temperature in three boreholes and two locations on the Sava river and, on a weekly basis, in ten boreholes in the Krško-Brežice fields. The groundwater level remained the same when compared to previous years.



# DATA ON RADIOACTIVE WASTE AND SPENT NUCLEAR FUEL

In 2013, 202 packages of radioactive waste were stored, with a volume of 42.4 cubic meters. The waste also includes 10 castings which were returned to Krško NPP after smelting radioactive metal material. In accordance with accepted practice all compressible waste material is compressed in the super compactor on a regular basis as it is generated, while combustible waste is prepared for shipment to the external contractor for incineration. There are 250 standard drums of combustible material planned for incineration in 2014. The total volume of radioactive waste in the interim storage on 31st December 2013 was 2250.6 m<sup>3</sup>, while the total activity was 19.3 TBq.

The spent fuel storage pit contains 1096 spent fuel elements from the previous 26 fuel cycles. The overall mass of spent fuel material is 448 tonnes.

# ENVIRONMENTAL MANAGEMENT AND COMMUNAL WASTE

Since the end of 2008, the ISO 14001 environmental management standard has been operating in NPP. Since the certificate was granted, the system has been checked regularly on an annual basis by an external certification organisation. Regular control assessment was completed. It was established that NPP adequately respects the environmental management system requirements.

With this system, municipal waste separation practice was introduced. The volume of mixed communal waste was similar to that in previous years; similarly, this was the case with the volume of collected separated waste.

A special waste water treatment plant is used for communal waste water. Measurements of pH, temperature, non-soluble substances, chemical and biological use of oxygen at the outlet are taken by an external organisation, which is in line with the OVD requirements.



radio-chemistry.

### ENVIRONMENTAL IMPACT



# **MEASUREMENTS OF RADIOACTIVE RELEASE AND ENVIRONMENTAL SAMPLES**

The laboratory for radioactive protection regularly checks air and environmental samples by an accredited method, thus having fulfilled the conditions set by the standard SIST EN ISO/IEC 17025 since 2007, which is checked by a Slovenian accreditation body. The accredited measurements of radioactivity of periodically inspected samples of liquid releases are carried out by the laboratory for



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 on-going 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 startup 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. The practices of NPP concerning the environment are in accordance with the ISO 14001 standard, internationally the most widely recognised environmental management system.

pleted by 2018.

One of the vital aspects of maintaining and improving safety in the nuclear industry is respecting operating experience. The nuclear accident at Fukushima Daiichi nuclear plant in Japan which happened in 2011 as a result of a powerful earthquake and tsunami had a great impact on the entire nuclear industry. As a response to the events in Japan, NPP prepared and implemented certain short term action plans, and prepared long term action plans on the basis of experience in the industry and management requirements. In January 2012, an integrated Safety upgrade program was approved. The program defines projects for upgrading certain safety systems, the electrical safety power supply, supervision of radioactive discharges, flood safety and storage of spent nuclear fuel. Certain projects have been completed, some are in progress; however, the overall program is anticipated to be com-

# ANNUAL REPORT 2013

In June an internal successful operative exercise in the event of an emergency was carried out in which some external organisations took part. It was carried out as a regular annual verification of NPP readiness in the event of an emergency in NPP. The main objective of the exercise was to verify suitability and harmonisation of the NPP's Protection and Rescue Plan (NZIR), operational and other procedures, organisation and expertise of the intervention teams and support institutions, the operations of management centres, the functional ability of equipment and connections as well as harmonisation of NPP's protection and rescue plan with the procedures in the event of an emergency by URSJV and external support institutions. The exercise proved the suitable readiness of NPP for such events and revealed areas where improvements are possible. In addition to the exercise, in accordance with the professional training program, training on the subject of first aid and medical treatment of contaminated injured individuals was conducted, as well as evacuation of a limited scope, fire extinguishing and engaging emergency event management organisations.





The legislation and international standards require that, from time to time (every ten years), the plants carry out a safety review and prepare a report which is to be submitted to a competent administrative body. The legal basis for it is stipulated in the lonising Radiation Protection and Nuclear Safety Act and the Rules on operational safety of radiation and nuclear facilities. In 2011 the second periodic safety review of NPP started. The main objectives of these periodic safety reviews are to prove that the plant meets the requirements stipulated in the administrative permits and international safety standards, to demonstrate the suitability of the measures until the following such periodic review, and to compare the safety results with those of the previous safety review. Planned review activities were carried out throughout 2012. The final report of the second periodic review was submitted to the competent administrative authority by the end of 2013.

The external auditing commission successfully completed auditing the Occupational Health and Safety Management System BS OHSAS 18001 and the Environmental Management System ISO 14001.

# PROCESS **AUDITING**

Maintaining nuclear safety has been one of the priorities in every field of work in NPP. By maintaining high levels of quality, the plant's systems and equipment are kept in operation in compliance with the design values; in this manner, different processes of the plant can be under independent surveillance, such as design changes, plant procedure revisions, spare parts and services purchasing and other processes. In addition, independent audits are carried out - plant processes auditing and auditing by external companies, contractors and equipment suppliers. The purpose of such audits is to ensure independent assessments of processes and thus to maintain criteria defined in international standards concerning nuclear technology vital for quality, including:

- organisation;
- quality program;
- internal processes (design, production, special processes etc.);
- documents and records control;
- non-compliance control;
- Corrective Action Program;
- training, etc.

There were eight audits concerning NPP's internal processes auditing, including environmental management, health and safety at work, organisational effectiveness, corrective program, operations, maintenance, radiation protection, chemical processes, and security.

A team self-assessment of system configuration inspection was carried out and of safety culture. The safety culture self assessment was conducted by means of a questionnaire and it included both the plant's employees as well as contractors' staff who are effectively based at the premises of the power plant.

# **OBSERVATION**

The fundamental objective of observations is to identify deviations in the work processes and take relevant corrective actions, and to underline the desired standards. Achieving high standards of work processes in terms of their excellence is a complex task, necessitating time and on-going observations and simultaneous corrective acting. In order to ensure uniform observation, a special procedure has been prepared with instructions for the preparation, execution and observation results analysis.

In 2013, more than 250 observations were carried out in NPP during its operation and shutdown. All disciplines and work groups underwent the observation procedure in different organisational units and external contractors. The monitoring results analyses of the last few years showed that some work processes could be improved, in particular in the sphere of documentation and work preparation.

Suppliers are audited by NPP's own staff or together with NUPIC, an international company who organises and carries out regular team audits at suppliers' premises. There were 26 independent audits of external suppliers from Slovenia, Croatia, France, Germany, Belgium, Sweden, and USA. With the NUPIC organisation we took part in eight audits. The annual audit plan was slightly larger in comparison with previous years.

# INVESTMENTS

The Treaty between the Republic of Slovenia and the Republic of Croatia on the regulation of the status and other legal relations regarding investment, exploitation and decommissioning of the Krško Nuclear Plant enables the plant to make provisions for long-term investments in reconstruction and technical upgrading which affect the safety and economical effectiveness of the power plant. The provisions of the Treaty, requirements set by the Slovenian Nuclear Safety Administration (URSJV), recommendations by the suppliers of the essential technological systems, operating experience at home and abroad, as well as international professional organisations are the basis for a 5-year plan of technological upgrading. Therefore, there have been over 800 modifications carried out in the plant (technological changes) which had a direct impact on better safety and/or reliability of the operations, a fact supported by WANO (World Association of Nuclear Operators) performance indicators.

3.0 Major Technological Modernisation



ANNUAL REPORT 2013

After systematic analysis of specified technological problems, we established that in the next 5-year period, more than 100 additional technological upgradings will be necessary, including upgrading included in the Safety upgrade program which has to be finished by the end of 2018 to meet the requirement set in the ruling of the Slovenian Nuclear Safety Administration (URSJV).

The majority of the investment in technological upgrading was carried out during the outage in October and November, when 32 modifications were successfully completed; some major and complex projects include:

# SWITCHYARD RECONSTRUCTION

In accordance with the Agreement on the technical aspects of investments, a complete reconstruction of the switchyard was undertaken by the plant and system operator (ELES). The reconstruction was started during the 2010 outage, and was continued during the 2012 and 2013 outages; it included the replacement of the entire primary equipment such as circuit breakers, separators and busbars, and the replacement of measuring and control systems. We installed modern computerised control of primary equipment. The investment is to end during the 2015 outage, when the switchyard unit supply system will be replaced. The switchyard reconstruction is very important to reliable operation of the electricity system in this part of Europe and for ensuring reliable electricity supply to people.





# INSTALLATION AND CONNECTION OF POWER TRANSFORMER

The objective of the modernisation is the replacement of the main transformer of the rated power of 400 MVA with a new transformer with the power of 500 MVA. The new transformer is to eradicate bottlenecks in distribution of power into the electricity system and restore the power plant into the prime configuration with two transformers of equal capacity. This enables the utilisation of the total NPP's capacity regarding active and reactive power after the replacement of the steam generator, turbine and generator. It will provide for additional capacity of future technological upgrading.

# INSTALLATION OF A NEW PRIMARY TEMPERATURE MEASUREMENT SYSTEM

The primary coolant temperature measurement system had a by-pass installed on the A and B cooling loops, fixed to hot, cold and intermediate legs and had a total of 30 valves. Due to difficult maintenance and the potential danger of leak, all valves and by-lines were removed during the 2013 outage, while temperature measurement sensors were installed into the primary coolant tube. Such a solution is to reduce operational and maintenance interventions and potential leaks of the primary coolant.



### MAJOR TECHNOLOGICAL MODERNISATION





# **INSTALLATION OF CONTAINMENT** FILTERING AND VENTING SYSTEM

The installation of the passive filtering and venting system of the containment ensures minimum release (less than 0.1%) of radioactive fission products of the core into the environment in the event of a severe accident. A dry filtering system was installed composed of five aerosol filters in the containment, iodine filter in the auxiliary building, pipe line with a releaf plate, valves, orifice, nitrogen station, radiological monitor, and the relevant instrumentation. The fundamental aim of the modification was to preserve the integrity of the containment to prevent its destruction in the event of a bad accident which could cause uncontrolled pressure increase.





# **INSTALLATION OF PASSIVE** AUTOCATALYTIC HYDROGEN **RECOMBINERS IN THE** CONTAINMENT

The installation of Passive Autocatalytic Hydrogen Recombiners will result in reducing the concentration of explosive gases (hydrogen and carbon-monoxide) in the containment in the event of a severe accident. The equipment installed needs no electric power for its operation; therefore, it works at a complete loss of power supply of the plant. The safety upgrading will ensure the integrity of the containment in the event of a severe accident.





ANNUAL REPORT 2013

ANNUAL REPORT 2013

# THE EXTENSION OF THE FIRE **DETECTION SYSTEM IN THE TECHNOLOGICAL PART OF THE** NUCLEAR POWER PLANT

The aim of this project is the modernisation and extension of the fire detection system in the entire technological parts of the Krško NPP. The project included: modernisation of smoke, heat and manual alarm systems and wet sprinkler systems and the extension of the detection system to all technological parts of the plant. A new alarm panel is located in the main control room which also provides a graphic display of events transmitted by the new fire station network. A similar alarm display is also located in the fire department unit on duty.



**4.0** Major Maintenance Activities and Inspection of Pressure Boundaries Appropriate inspection, maintenance and upgrading ensure the operational readiness of equipment. Maintenance falls into the categories of preventive maintenance, carried out at specific intervals defined in programs, i.e. 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.

There are also other activities carried out in accordance with programs related to the management of ageing equipment, components and structures.

During corrective measures on important equipment, which is included in the preventive maintenance program, a detailed root cause analysis is carried out and if necessary the preventive maintenance program is revised accordingly.

The most vital maintenance activities were carried out during the outage while the others took place during plant operations, most of them in accordance with the preventive maintenance plan and management of ageing equipment and components.

The regular maintenance during the 2013 outage included: overhaul and revision of highvoltage and low-voltage motors, switches and other electrical equipment; instrumentation gauging, inspection of equipment degradation incurred during plant operation by means of non-destructive testing methods, overhaul of valves, ventilation systems and other mechanical equipment, overhaul of diesel sets, overhaul of various pumps on the secondary systems, etc.

Major work included: high-pressure turbine overhaul, overhaul of two turbine stop and four regulating valves, inspection of steam generator's tubes with the Eddy current method in the area of tube walls and the first supporting plate, reactor vessel inspection, the internal reactor structures and ultrasonic inspection of the reactor baffle plate connecting bolting, replacement of the second main transformer, replacement of in-core nuclear instrumentation thimble guides, replacement of all main transformer No. 1 seals, various activities according to the equipment ageing monitoring program.







## MAJOR MAINTENANCE ACTIVITIES AND INSPECTION OF PRESSURE BOUNDARIES

ANNUAL REPORT 2013

The results of all inspections by means of non-destructive methods showed that the integrity of the pressure boundaries is intact as not a single indication of degradation due to operations was identified.

In line with the secondary system inspection program, inspection of erosion and corrosion effects detected no conditions which would necessitate special corrective measures.

Other maintenance work was carried out during plant operation in accordance with planned activities; however, there was no major corrective work done which would essentially affect safety and/or plant availability.



NPP's 2013 total output at the generator outlet was 5 299 615.10 MWh of gross electricity or 5 036 473.40 MWh of net electricity. The planned output figure was 5 317 000 MWh; the actual annual output was slightly lower than planned due to the extended outage and two unplanned reactor trips in February and November. The availability factor was 84.40 percent, while the capacity factor was 83.47 percent.

A very extensive and demanding outage with refuelling lasted for 49 days, i.e. from 1<sup>st</sup> October 2013 until 18th November 2013. In addition to regular refuelling of nuclear fuel and regular outage work, other complex work was done to the equipment, e.g. replacement of thimble guides of the in-core nuclear instrumentation, steam-generator sludge lancing and inner bundle lancing, replacement of 125 VDC safety train A and 220 VDC non-safety train battery replacement, seal replacement of main transformer No. 1, high-pressure turbine overhaul, inspection and repair of inlet channel system of circulating cooling water and cooling towers, inspection of thickness and replacement of secondary piping, etc.

Several extensive modernisations were carried out to the vital systems of the plant, including: optimisation of primary cooling system temperature measurement, extension of the fire detection system in the technological part of the power plant, and the reconstruction of the 400 kV switchyard. Special emphasis is to be given to the project of Passive Autocatalytic Hydrogen Recombiners in the reactor building for hydrogen combustion during potential severe accident, and the Passive Containment Filtering and Venting system, completed during the outage according to the Safety Upgrade Program. This program specifies the upgrading of certain safety systems, electric safety supply, radioactive outlet surveillance, flooding security, and the storage of spent nuclear fuel.

During the outage we were faced with damage to nuclear fuel elements, contaminants of primary system in the water for steamgenerator sludge lancing, damage to the main turbine regulation valve covers, the mass injection between the concrete and supporting plate of the seal oil system of the main generator. There were six injuries during work, all of them minor. The outage was 13 days longer than planned.



Gross energy produced: 5 299 615.1 MWh Net energy produced: 5 036 473.4 MWh Availability factor: 84.40% Capacty factor: 83.57%



POWER (MW)

## 1. Turbine valves test.

- 2. Automatic plant shutdown due to inadvertent MSIV closure.
- 3. Automatic plant shutdown due to improper functioning of the new system for measuring the temperature of the reactor coolant.

# UNPLANNED AUTOMATIC **REACTOR SHUTDOWNS** AT 7000 HOURS CRITICALITY



# PLANT CAPACITY FACTOR



NEK TARGET FOR 2013: ≥ 88%



In 2013, the specific activity of the primary coolant and its contamination were above strategic limits due to fuel leakage. After the completion of regular outage and removal of the leaking fuel from the reactor, the leakage was less than the prescribed limits. The fuel reliability indicator for 2013 prior to outage exceeded the approved target figures set by Krško NPP and INPO. After the outage the reliability of fuel was improved and reached the target figures of Krško NPP and INPO.

PERCENT

# PERFORMANCE



AUTOMATIC REACTOR SHUTDOWNS

# NUCLEAR FUEL AND SECONDARY CHEMISTRY SYSTEM

# FUEL RELIABILITY **INDICATOR**



FOR 2013: ≤ 5E-04 Ci/m<sup>3</sup>

Ingress of aggressive electrolytes into the secondary system was low; therefore, corrective measures were not needed. The target WANO values of the secondary chemistry system which are 5-7 times lower than prescribed values for normal operations, were in March slightly over the limit due to unplanned shutdown. The shutdown during the cycle had an expected impact on higher release of corrosion products. Monitoring of key parameters was effective, as well as the cleaning systems which contributed to the effective chemistry program.

# SECONDARY CHEMISTRY PERFORMANCE **INDICATOR**



FOR 2013: ≤ 1.05

# SERVICE AND EQUIPMENT PURCHASING

In February 2013 Krško NPP became liable to public procurement and has to respect the Public Procurement in the Water, Energy, Transport and Postal Services Act (ZJNVETPS).

Due to this new legislation, all long-term agreements on cooperation with strategic partners had to be terminated although they had proven to be a good basis for the provision of high-quality, timely and competitive services; consequently, the purchasing procedures are longer and the administration of the overall process more complex.



INDICATOR

The majority of orders for the 2013 outage had been finalised before Krško NPP became liable to public procurements according to the new ZJNVETPS act, which gave us suitable flexibility in additional ordering the services and material for the outage.

In the last years and considering foreign markets, cooperation has been deteriorating in particular with American suppliers, while the difficulties with domestic suppliers relate mainly to poor organisation of the companies.



# 6.0 International Cooperation

# tors (WANO). NPP has been a member of this organisation since its establishment in 1989. Its aim is to promote the highest standards of operational safety, availability and excellence

WANO

of nuclear power plants. WANO implements a program for sharing operating information, promoting communication, mutual comparison and copying of best practice and solutions among its members.

**EXPERIENCE OF OTHERS –** 

**GUIDANCE FOR OUR WORK** 

parable operating and safety results.

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 com-

All nuclear facilities in the world are members

of the World Association of Nuclear Opera-

# 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 nuclear plants and/or their operators 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

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 as well as technology and/or 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 programs such as control over nuclear material, nuclear technology application, nuclear energy, nuclear safety and technical cooperation. As part of these programs, the IAEA organises OSART (Operational Safety Review Team) missions which involve visiting power plants in order to inspect 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.

# EPRI

EPRI (Electrical Power Research Institute) is a non-profit and independent organisation for research in the area of electricity production and environment protection. 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 facilities for processing nuclear material. Together with the Slovenian Nuclear Safety Administration (URSJV) and the Jožef Stefan Institute (IJS), NPP is a member of a number of programs which give access to information and literature in various relevant fields.

# PWROG

PWROG (Pressurized Water Reactor Owners Group) is the association of all the pressurized water reactor (PWR) operators and Westinghouse. It offers various programs 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, analyses by contemporary programs and analytical methods, etc.

# **ENISS**

As a member of ENIS group (European Nuclear Industry Safety Standards), Krško NPP took part in the preparation of the EU nuclear industry position in drafting amendments to legislation in this industry. The work group acts within FORATOM, an EU nuclear industry organisation.

# NPP ACTIVITIES IN 2013

The President of the NPP Management Board is a Governing Board member of the WANO Paris Centre, made up of representatives of all member countries of the Centre. One NPP employee is temporarily employed in the WANO Paris Centre and is a member of the group conducting peer reviews.

NPP has actively cooperated in WANO and INPO for years. We have had three missions of WANO peer review, while our representatives took part in 38 such missions worldwide. In 2013, our representative actively participated in the WANO international peer review at Doel in Belgium.





Within the framework of Technical Assistance Missions, NPP has so far received 32 such missions covering all activities of the plant. In 2013, we received a mission for effective organisation of the plant. Three of our experts participated in missions in the power plants Trilo, Spain, in the preparation for the emergency event project, Brokdorf, Germany, in the inspection of systems operation project, and in Vandellos, Spain, in the minor incident reporting project.

Our representatives regularly take part in specialist training programs organised by these organisations. Due to good results, our plant has become a model example for other operators of nuclear plants and a source of good experience in various fields of work. So far, representatives of nine countries for 19 different areas have visited us through WANO, while our representatives have become familiarised with good practice in five countries.

visitors.

- Engineering);
- non-destructive testing and researches (NDE - Non-Destructive Examination),
- exchange of experience in application of programs for accident analysis (MAAP -Modular Accident Analyses Program User Group);
- exchange of information in the field of erosion/corrosion - CHUG (Checworks Users Group).

### INTERNATIONAL COOPERATION

As part of our cooperation with the IAEA, we have organised three OSART and some other missions. Our specialists have taken part in 16 such missions world-wide. IAEA's inspectors, who safeguard nuclear fuel, are our regular

- 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

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.



Professional training was carried out to ensure that training programs 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 in line with its goals and policy.

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

Annual plan and training needs as established and prepared together with heads of individual organisational units of the power plant, were the basis for preparation and execution of individual courses.

# TRAINING OF OPERATING PERSONNEL

Professional training courses for operating personnel were prepared and carried out taking into account relevant legal regulations, internal procedures and the two-year plan.

We continued training according to the Initial Operating Personnel program for a licence and completed internal training of five new reactor operators with exams. All were successful at the exams and obtained the first reactor operator licence awarded by an expert examination commission, appointed by URSJV. At the same time, initial training of 15 candidates was started, after having completed successfully the first training phase - Theoretical Basis - in April 2013, and then 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.

The change of generation process is slowly coming to an end and in 2013 it was for the first time after several years that there was no first phase training of operators and newly employed engineers in November as the case was in the previous years. The first phase training will be conducted in the future every second year.

On-going professional training of licensed personnel was conducted in accordance with the approved outline program 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.

ANNUAL REPORT 2013

In the final annual session, 23 candidates successfully passed tests for licence renewal, of which eight were for reactor operator, six for senior reactor operator, and nine for shift engineer. Five candidates successfully passed the exams for the first award of senior reactor operator.

The on-going professional training for equipment operators was conducted in parallel with the training for licensed personnel, in four weekly training sessions. The program focused on hands-on training by using system operation procedures in the technological building or in the classroom which was actively linked with the full-scope simulator. Other training was rendered aimed at refreshing and upgrading existing knowledge and skills which equipment operators need in their day-to-day work.

A group of ten operating personnel attended four-day practical training, which included the use of fuel handling equipment which was aimed at preparing all participants for safe and first-class performance of this important refuelling activity.

Prior to refuelling, as the practice was in past years, training was conducted for staff connected with the fuel receipt and refuelling activities; the training was attended by individuals from different departments.

Operating personnel underwent training on the full-scope simulator prior to major activities in the facility. All major modifications which affect the operation and response of the plant were simulated on the simulator.

# TRAINING FOR PERSONNEL IN MAINTENANCE AND OTHER SUPPORT FUNCTIONS

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

Within the framework of initial training for technical personnel, a course in the fundamentals of nuclear power plant technology (OTJE) was carried out. In line with regular practice, the course was conducted in collaboration with the Training Centre for Nuclear Technology (ICJT). The OTJE courses are conducted in two parts - in the first part theoretical fundamentals are covered, while the second part focused on systems and operations of the power plant. A total of three NPP staff attended this training in 2013.

<image>

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

Under an on-going training of maintenance personnel in two segments, we supported a training program on the subject of general and legally required areas. The maintenance personnel were updated on the new aspects of plant processes and operational experience.

A group of ten maintenance staff took part in a four-day hands-on training in handling refuelling equipment.

# OTHER LEGALLY PRESCRIBED AND GENERAL TRAINING

We continued with the implementation of established programs of initial and refresher courses, such as health and safety at work, fire protection, hazardous substances, protection and rescue plan (NZIR), etc.

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

Furthermore an extensive NZIR drill was conducted, supported by the 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, and innovations in the area of production processes; we also continued with general courses in the areas of computer literacy and foreign languages.

Prior to the beginning of the regular outage an extensive general program of courses was conducted for external contractors; over 3000 people took part in this program. Most of them completed the General employee training program (1762), 700 candidates completed the programs related to radiation protection (Radiation Protection 2, Radiation Protection 3), and 160 candidates completed the training for work group leaders.







In accordance with the Companies Act (ZGD-1) and the Articles of Association of NPP, a summary of the NPP Report for 2013 is given below. The summary includes the main characteristics of business operations in 2013 and consolidated fundamental financial statements. The full versions of fundamental financial statements are presented in the NPP Annual Report for 2013 prepared in accordance with the Agreement concluded between the Government of the Republic of Slovenia and the Government of the Republic of Croatia on regulation of status and other legal relationships relating to investments into the Krško Nuclear Power Plant, its exploitation 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 2013 was submitted to the organisation authorised to process and publish the data the first working day after it had been accepted at NPP's General Meeting, and is published on its website.

The year 2013 was marked by an exceptionally demanding outage which included, in addition to planned activities, consequences of the damage to three fuel elements. The outage was longer than planned and additionally, we had two automatic reactor trips. Therefore, the supply of electricity was 281 GWh less than planned. Thus, we supplied 5,036 GWh of electricity. In spite of this, we had a successful year.

expenses.

The structure of expenses is illustrated in the graph below.

In spite of lower output, the business was within the framework of planned costs. We generated a revenue in the amount of  $\in$  194,374 thousand and expenses in the amount of € 194,101 thousand. The revenue of 2013 is by € 273 thousand higher than

# STRUCTURE OF **EXPENSES IN 2013**



ANNUAL REPORT 2013

The largest portions in the structure of expenses are represented by the cost of depreciation, the cost of material and services, the cost of labour and the cost of nuclear fuel, amounting to a total of 92 percent of all expenses.

Investments were made in technological upgrading, while some expenses represent minor investments. Due to changed investment timing, we needed no planned long-term loan in 2013. The long-term debt was reduced in accordance with the plan. Depreciation funds were used to pay four instalments of a longterm loan taken for the replacement of the reactor head and work concerning pressurizer welding, and four instalments of a longterm loan for investments in technological upgrading.

The financial position of NPP is satisfactory. Long-term resources cover all long-term assets and also all inventories. Business results are demonstrated in the consolidated fundamental financial statements. These should be interpreted together with notes detailed in the NPP Annual Report 2013 which is published on AJPES (Agency of the Republic of Slovenia for Public Legal Records and Related Services) website (www.ajpes.si).

# AUDITOR'S REPORT **ON FINANCIAL STATEMENTS TO BE PUBLISHED** FOR PUBLIC USE

# KPIAG

# Auditor's Report for Public Reporting Purposes

We have audited the financial statements of the company Nuklearna elektrarna Krško d.o.o. and the related notes for the financial year ended 31 December 2013, in accordance with International Standards on Auditing, on which the summaries of financial statements are based. In our report dated 10 March 2014, we have issued the opinion that the financial statements and the related notes on which the summaries of financial statements are based, give a true and fair view of the financial position of the Company as of 31 December 2013, the results of its operations, its cash flows for the year then ended in conformity with the International Contract entered into between the Republic of Croatia and the Republic of Slovenia, and in conformity with Slovenian Accounting Standards issued by Slovenian Institute of Auditors.

In our opinion, the attached summaries of the financial statements comply, in all material aspects, with the financial statements from which they originate.

For a better understanding of the financial situation of the Company as of 31 December 2013, the results of its operations, its cash flows for the year then ended, and the scope of our audit, it is necessary to read the summaries of the financial statements together with the financial statements from which they originate and with our Auditor's Report on these financial statements.

# podjetje za revidiranje, d.o.o.

Tomaž Mahnič, ACCA Certified Auditor

Katarina Sitar Šuštar

Partner

KPMG Slovenija, d.o.o.

Ljubljana, 10 March 2014

### SUMMARY OF THE 2013 FINANCIAL STATEMENTS

# KPMG SLOVENIJA,

# BALANCE SHEET AS AT 31 DECEMBER 2013

	in t	housand EUR
BALANCE SHEET ASSETS	31/12/2013	31/12/2012
A. LONG-TERM ASSETS	370 243	399 314
TANGIBLE FIXED ASSETS	369 654	398 663
INVESTMENT PROPERTY	464	510
LONG-TERM FINANCIAL INVESTMENTS	125	141
B. CURRENT ASSETS	137 762	105 098
INVENTORIES	65 771	70 169
SHORT-TERM FINANCIAL INVESTMENTS	50 150	16 688
SHORT-TERM OPERATING RECEIVABLES	21 818	18 226
CASH	23	15
C. SHORT-TERM DEFERRED EXPENSES AND ACCRUED REVENUE	525	252
TOTALASSETS	508 531	504 664
OFF-BALANCE SHEET ASSETS	1 302	12 383

	in tl	housand EUR
BALANCE SHEET 31	/12/2013	31/12/2012
EQUITY AND LIABILITIES		
A. EQUITY	439 753	439 5 <sup>1</sup> 5
CALLED-UP CAPITAL	353 545	353 545
REVENUE RESERVES	88 675	88 675
REVALUATION SURPLUS	(35)	-
RETAINED EARNINGS	(2 705)	(2 705)
NET PROFIT OR LOSS FOR THE FINANCIAL YEAR	273	-
B. PROVISIONS AND LONG-TERM ACCRUED COSTS AND DEFERRED REVENUE	6 962	6 605
PROVISIONS FOR JUBILEE BENEFITS AND TERMINATION BENEFITS	6 342	5 924
OTHER PROVISIONS	620	681
C. LONG-TERM LIABILITIES	9 565	14 897
LONG-TERM FINANCIAL LIABILITIES TO BANKS	9 320	14 640
LONG-TERM OPERATING LIABILITIES	245	257
Č. SHORT-TERM LIABILITIES	52 118	43 497
SHORT-TERM FINANCIAL LIABILITIES TO BANKS	5 320	5 320
SHORT-TERM OPERATING LIABILITIES	46 798	38 177
D. SHORT-TERM ACCRUED COSTS AND DEFERRED REVENUE	133	150
E. TOTAL EQUITY AND LIABILITIES	508 531	504 664
OFF-BALANCE SHEET LIABILITIES	1302	12 383

# INCOME STATEMENT FOR THE YEAR ENDED 31 DECEMBER 2013

# 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 -

# CASH FLOW STATEMENT FOR THE YEAR ENDED 31 DECEMBER 2013

# CASH FLOW STATEMENT

- 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

### SUMMARY OF THE 2013 FINANCIAL STATEMETS

	in t	in thousand EUR		
	2013	2012		
	193 874	189 644		
	193 551	189 394		
	323	250		
	500	391		
	550	641		
	(50)	(250)		
	273	0		
	0	0		
– VIII)	273	0		

in t	housand EUR
2013	2012
212 556	210 818
139 193	121 422
73 363	89 396
330	227
67 887	77 458
(67 557)	(77 231)
0	120 910
5 798	133 072
(5 798)	(12 162)
23	15
8	3
15	12



STATEMENT OF CHANGES IN EQUITY FOR THE YEARS 2013 AND 2012

in thousand EUR

EQUITY COMPONENTS	CALLED-UP CAPITAL	PRO RESEI		REVALUATION SURPLUS	RETAIN PROFI		NET PROFIT OR LOSS FOR THE FINANCIALYEAR	TOTAL EQUITY
	NOMINAL CAPITAL	LEGAL RESERVES	STATUTORY RESERVES		RETAINED NET PROFIT	RETAINED NET LOSS	NET PROFIT	
OPENING BALANCE 1.1.2013	353 545	35 354	53 321	-	-	(2 705)	_	439 5 <sup>1</sup> 5
TOTAL COMPREHENSIVE INCOME OF FINANCIAL YEAR	-	-	-	-	-	-	-	-
TRANSFER OF NET FINANCIAL RESULT OF FINANCIAL YEAR	-	-	-	-	-	-	273	273
CHANGES WITHIN EQUITY CAPITAL	-	-	-	-	-	-	_	_
OTHER CHANGES IN EUITY CAPITAL	-	-	-	(35)	-	-	-	(35)
CLOSING BALANCE 31. 12. 2013	353 545	35 354	53 321	(35)	-	(2 705)	273	439 753
OPENING BALANCE 1.1. 2012	353 545	35 354	53 321	-	-	(2 705)	-	439 5 <sup>1</sup> 5
TOTAL COMPREHENSIVE INCOME OF FINANCIAL YEAR	-	-	-	-	-	-	-	-
TRANSFER OF NET FINANCIAL RESULT OF FINANCIAL YEAR	-	-	-	-	-	-	-	-
CHANGES WITHIN EQUITY CAPITAL	-	-	-	-	-	-	_	_
OTHER CHANGES IN EUITY CAPITAL	-	-	-	-	-	-	-	_
CLOSING BALANCE 31. 12. 2012	353 545	35 354	53 321	-	-	(2 705)	-	439 5 <sup>1</sup> 5

# SUMMARY OF THE 2013 FINANCIAL STATEMENTS





# In accordance with the intergovernmental Agreement between the Government of the Republic of Slovenia and the Government of the Republic of Croatia on regulation of status and other legal relationships relating to investments into the Krško Nuclear Power Plant, its exploitation 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.

# SAFE AND LONG-TERM **OPERATION LIES WITH** COMPETENT AND MOTIVATED STAFF

ANNUAL REPORT 2013

At the end of 2013 there were 636 staff employed in NPP, of which more than 40 percent were with higher professional education and a university degree. There are 7 doctors and 14 staff with a master of science degree. Positions in operations, maintenance, engineering, quality and professional training which is three quarters of all employees are held by specialists in electrotechnical, mechanical and nuclear sciences, chemistry, physics, computer science and civil engineering of various educational levels. Through systematic training organised by NPP and in collaboration with domestic and international organisations , the staff gain specialist knowledge in the field of nuclear technology and work processes supporting the plant.

ANNUAL REPORT 2013

Competent staff is one of the key elements in ensuring safety and reliability of NPP operations; therefore, the staff is offered comprehensive professional development. We support their further education and training. The generation change is coming to an end in NPP; most of those who worked in the plant from the construction and beginning of the operation have now retired. The continuity of professional training has been maintained by timely implemented programs of systematic and planned transfer of knowledge, skills and experience to young staff.

Encouraging working environment and international engagement are reasons for young professional staff to seek employment in NPP as their challenge and opportunity for their professional development. We are pleased that we can recruit good staff. Therefore, the natural course of retirement is almost the only reason for our staff to leave. In the entire operational period we have had high level human resources stability. Last year's annual figure of staff leaving was 1 percent.

By granting scholarships and other forms of collaboration we make foundations for a long-term cooperation already at the studies stage. Scholarships are granted to students in science and technical subjects to obtain educational level VII. The response of the young last year was very good. We granted 6 scholarships to students of the Bologna second degree studies for subjects in deficit. At the end of the year we had 20 scholarship recipients.



# ORGANISATION





ARSO	Agencija Republike Slovenije za okolje /Slovenian Envir
BS OHSAS	British Standard – International Occupational Health an
CHUG	Checworks Users Group
ELES	Elektro – Slovenija
ENISS	European Nuclear Industry Safety Standards
EPRI	Electrical Power Research Institute
IAEA	International Atomic Energy Agency
IBL	Inner Bundle Lancing
ICJT	Izobraževalni center za jedrsko tehnologijo /Training Cer
IJS	Institut Jožef Stefan /Jožef Stefan Institute/
INPO	Institute for Nuclear Power Operations
I&C	Instrumentation and Control
ISI	In-Service Inspection
ISO	International Organisation for Standardisation
MAAP	Modular Accident Analysis Program User Group
NDE	Non-Destructive Examination
NEK	Nuklearna elektrarna Krško /Krško Nuclear Power Plant
NMAC	Nuclear Maintenance Application Centre
NRC	Nuclear Regulatory Commission
NUMEX	Nuclear Maintenance Experience Exchange
NUPIC	Nuclear Procurement Issues Committee
NZIR	Načrt zaščite in reševanja /Protection and Rescue Plan/
OSART	Operational Safety and Review Team
OTJE	Osnove tehnologije jedrskih elektrarn /Fundamentals of
OVD	Okoljevarstveno dovoljenje /Environmental permit/
PNV	Program nadgradnje varnosti /Safety upgrade program/
PSE	Plant Support Engineering
PWROG	Pressurized Water Reactor Owners Group
SL	Sludge Lancing
SRS	Slovenski računovodski standardi /Slovenian accounting
URSJV	Uprava Republike Slovenije za jedrsko varnost /Slovenic
WANO	World Association of Nuclear Operators
ZGD	Zakon o gospodarskih družbah /Companies Act/
ZVISJV	Zakon o varstvu pred ionizirajočimi sevanji in jedrski var
	/Ionising Radiation Protection and Nuclear Safety Act/
ZJNVETPS	Zakon o javnem naročanju na vodnem, energetskem, tran
	/Public Procurement in the Water, Energy, Transport and

# ANNUAL REPORT 2013

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