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KOZLODUY NPP PLC
ANNUAL REPORT
2012





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Dear Readers,

The summarized results of the Kozloduy NPP PLC activity during the elapsed 2012 are hereby presented as a token of our belief that we have to continue developing a policy of straightforwardness, transparency and keeping the public informed.

It was a consecutive year of difficult economic conditions in Bulgaria, and the European Union. However, notwithstanding the challenges, the nuclear power plant achieved its business goals. We achieved our most important target of ensuring safe, reliable, effective and clean power production. 15 785 217 MWh were generated for the twelve months of 2012 by Kozloduy NPP, thus providing one third of the national electricity generation by preserving its position as the major power generating capacity in the country.

Our work received a consecutive positive independent estimate during the OSART Mission of the International Atomic Energy Agency that was concluded in December. Yet once again did we manage to defend our positions and Kozloduy NPP prestige as one of the safest and most reliable operating nuclear power plants in the world.

I am proud to state that our successes are not limited to that. We are progressing with the implementation of the activities under Units 5 and 6 lifetime extension – a priority for Kozloduy NPP. We took the actual first step in the realization of a project on which we cherish our hopes for the forthcoming decades – the construction of a new power unit on the site of the first nuclear power plant in Bulgaria.

In conclusion, I would like to express my confidence that the Bulgarian Nuclear Power Plant shall successfully continue overcoming economic difficulties and due to the dedicated efforts of its entire team, it will remain a significant factor for reliable energy supplies and clean environment.

A handwritten signature in blue ink, appearing to read 'Valentin'.

VALENTIN NIKOLOV
EXECUTIVE DIRECTOR



ELECTRICITY GENERATION

As a result of the efficient and reliable operation of the nuclear power units, the gross electricity generation for 2012 amounted to 15 785 217.072 MWh which was 1.5% above the planned 15 554 840 MWh.

During the last year, the 1000 MW Units 5 and 6 have been

operated in compliance with the load schedule agreed with the Electricity System Operator and updated on-line in accordance with the Grid Management Procedures. The electricity generated by Units 5 and 6 accounted for 33.62% of the 2012 national electricity generation.

Since the commissioning of the first Power Unit in July 1974 until the end of 2012 Kozloduy nuclear power plant has generated 524 645 526.427 MWh of electricity in total meeting all the requirements for safe operation of nuclear facilities and without any impact on the environment.

Since its commissioning in 1987 the Unit 5 has generated 131 933 146 MWh electricity in total, and Unit 6 – 121 716 424 MWh, considered from 1991 to the end of 2012.

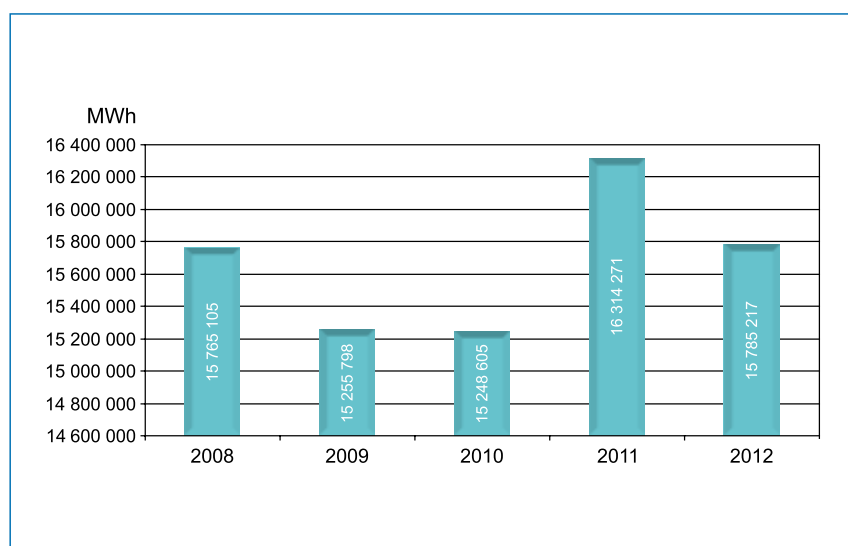
In order to meet the country demand for electricity, Kozloduy NPP has supplied to the national grid the net amount of 14 860 901 MWh electricity.

The major portion of the total net generation – 9 119 744 MWh (61.4%) – was afforded by the power plant to the “protected” consumers on the regulated market (households and small and medium size enterprises).

Being a reliable and preferred business partner, Kozloduy NPP sold the remainder of the net production (38.6%) on the free market supplying with electricity large industrial consumers and vendors in the country and in the region.

Regardless of the market dynamics, Kozloduy NPP preserved its leading position as a preferred and reliable electricity supplier in 2012 as well.

Electricity generated



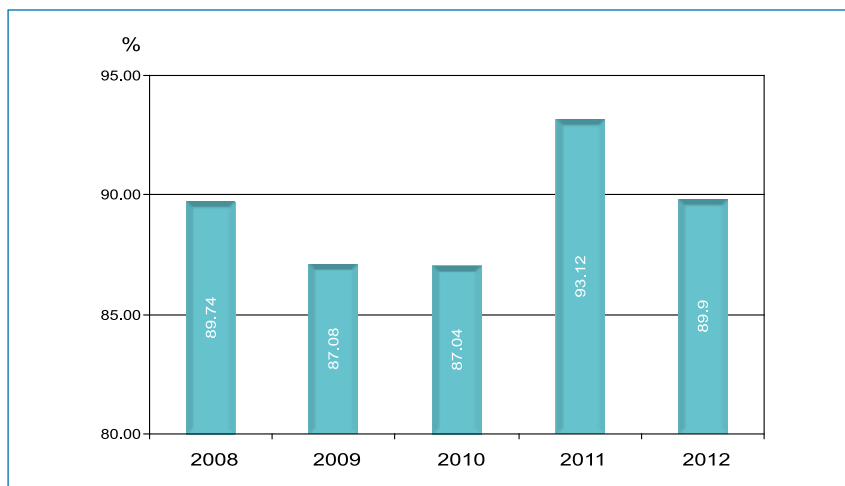
Electricity sold by Kozloduy NPP on the regulated and free markets



LOAD FACTOR

Load factor for Units 5 and 6 (%)

The Load Factor (LF) during normal operation is a complex indicator in terms of reliable operation and optimization of production and outage downtimes. Its value for the last year (89.9%) proves the consistent positive trend, visualising the remarkably good operating status of the Nuclear Power Units characteristic of the leading NPPs.



MAINTENANCE PROGRAMME

The annual outages with refuelling of Units 5 and 6 were performed with minimum downtime – 33 and 35 calendar days respectively, from the tripping of the turbine generator to its connection to the grid. A stable trend towards minimizing the planned downtimes of the Units during outages has shown in the last years as a result of the efficient organisation and coordination of the required

maintenance and modernization activities performed on the equipment.

As part of the planned downtimes in 2012 all the required activities related to the maintenance, repair, specialised surveillance and inspections of the main and auxiliary components of the safety systems, safety related systems, and systems important to the production have been completed

in compliance with procedures, regulations and licences. The annual outages objective is to ensure equipment operability and reliability and guarantee safety of the nuclear facilities.

A number of modernization and retrofit projects providing for the equipment and facilities' lifetime and enhancing the plant reliability and safety have been implemented throughout those downtimes.

HEAT GENERATION

Apart from electricity, Kozloduy NPP also generates thermal power in order to provide for the heating of on-site main and auxiliary facilities as well as of the consumers at

Kozloduy.

The main portion of the heat generated by the Unit 5 (6) boilers is used to supply the power plant house needs.

The heat supplied to the end consumers (households, businesses, and budget enterprises) throughout 2012 amounted to 77 891 MWh.





KOZLODUY NPP PLC MISSION AND VISION

In implementation of its mission to provide safe, efficient and environmentally friendly electricity generation at reasonably low prices to the country and the region, Kozloduy NPP PLC sets its long-term goal for safe and reliable operation of the nuclear power units throughout their entire lifetimes in compliance with the licences issued by the regulatory bodies.

The Company Management declares to meet the following priorities in accomplishing its long-term goals:

- highest safety level;
- efficient and competitive production;
- licenced, competent and motivated personnel;
- financial stability.

Kozloduy NPP PLC Management applies a Management System (MS), integrating all requirements for nuclear power plant activities, to achieve safe, efficient and environmentally friendly energy generation of guaranteed quality and security of supplies in compliance with national and international standards. It incorporates all management aspects and provides for coordination in implementing the requirements for safety, healthy and safe working conditions, environment, quality, and financial results in such a way as to place safety as an overriding priority.

The objectives and tasks of each integrated sphere are manifested in policies on safety, healthy and safe working conditions, environment, quality, security, economy and finance, training and qualification of personnel, fire safety, and human resources.

Kozloduy NPP PLC MS is developed

- in compliance with GS-R-3 "Facility and Activity Management System" and other applicable standards and IAEA Safety Guidelines;

- by considering the requirements of BNS EN ISO 9001 "Quality Management Systems – Requirements.", BNS EN ISO 14001 "Environment Management Systems", and BS OHSAS 18001 "Health and Safety Management Systems";

- by applying national and international regulations related to Kozloduy NPP PLC activity;
- process approach for control of implementation of activities and their interfaces.

Management System uses step approach in applying the requirements for the implemented activities and their outcomes (product, service) for each process of Kozloduy NPP PLC. The step approach is based on activity and outcome assessment according to specified factors by considering the following:

- significance and complexity of each product or activity;
- influence of each product or activity on safety, health, environment, quality, security, economy by placing safety first;
- possible consequences of inadequately performed activity or product non-conformance.

Kozloduy NPP PLC Management System is developed by considering the specific character of the company organizational structure and management, the actual running processes and good practices, and it is focused on the future development with the collaboration of the entire personnel.

In order to comply with the statutory and regulatory requirements, the utilities operating nuclear facilities maintain quality assurance programmes which enable the MS application in nuclear facility operation:

- Quality Assurance Programme for Kozloduy NPP Units 5 and 6 safe operation;
- Quality Assurance Programme

for Spent Fuel Storage Facility safe operation.

Within the MS of the nuclear power plant, quality systems are established in different structural units with the purpose of accreditation, certification or licencing, required by a regulatory act or managerial decision.

Being a nuclear facility operating utility, Kozloduy NPP PLC provides conditions for development and continuous enhancement of safety culture through the approved current Management System and safety receives the highest priority and significance for the long-term success of the Company.

The current Management System of Kozloduy NPP PLC is applied, evaluated and continuously improved to ensure safe, reliable and efficient operation of the nuclear facilities and implementation of the policies declared by Kozloduy NPP PLC.



LICENCING REGIME

The activity of Kozloduy NPP PLC as an organization operating nuclear facilities is subject to state supervision by the Bulgarian Nuclear Regulatory Agency (BNRA) at the Council of Ministers of the Republic of Bulgaria, as well as specialized supervision performed by the Ministry of Environment and Water, Ministry of Health, Ministry of Regional Development and Public Works, State Agency for Metrological and Technical Surveillance and State Agency for National Security.

In 2012, Units 3, 4, 5 and 6, and Spent Fuel Storage Facility of Kozloduy NPP were operated in compliance with the conditions of the Operating licences issued by the BNRA according to the Act on the Safe Use of Nuclear Energy.

Under the Council of Ministers' Decree No. 1038 of 19 December 2012, the Units 3 and 4 were announced as radioactive waste management facilities subject to decommissioning and along with the relevant property were declared a state private property. The Decree constituted the transfer of the facilities under the control of the State Enterprise Radioactive Waste (SE RAW). Until SE RAW is granted



the required licence to operate the relevant Unit as a radioactive waste management facility subject to decommissioning, Kozloduy NPP is in charge of the operation in compliance with the licences issued to Kozloduy NPP PLC for E mode of operation of both of the Units.

In August 2012, the operating licences of Units 5 and 6 were changed under the separate orders of the BNRA Chairman as new terms for performance of

provisional licencing conditions were permitted.

In relation to the implementation of the Units 5 and 6 power uprate project – 3120 MW, applications for change of the operating licences were submitted to the BNRA in early March 2012. The Regulator imposed additional requirements so that Kozloduy NPP PLC took the necessary steps towards their implementation.

In 2012, a contract was signed with Consortium OJSC "Concern Rosenergoatom" – Électricité de France for a comprehensive study of the plant physical status and rest lifetime assessment of the equipment and facilities at Units 5 and 6 for extension of their operational lifetime and meeting the licence conditions of the Regulator. In November and December 2012, the first documents developed under the Contract were submitted to the BNRA.

During the same year 19 applications were submitted to the BNRA and 18 permissions were granted, which resulted in changes of structures, systems and components to improve safety of Units 3, 4, 5 and 6.





SAFETY CULTURE

As a completion of the activities on the safety culture self-assessment implemented in 2011 at Kozloduy NPP, at the beginning of 2012, the efforts were focused on two directions – the introduction of the personnel to the self-assessment results and development of a safety culture enhancement programme. For this purpose, a summary containing a brief description of activities, participants, strengths and areas of improvement, as well as the planned measures to improve safety culture after the performed self-assessment was prepared and published on the plant Intranet.

The approved Programme for Safety Culture Enhancement at Kozloduy NPP PLC, includes a number of activities focused on the areas of improvement identified during the self-assessment, as the purpose is to repair the non-conformities and maintain high level corporate safety culture. It is a long-term programme covering the period by 2014. The performance of the activities is coordinated by the Safety Culture Council, which is an advisory body of Safety and Quality Director on safety culture related issues.

The Council activity is governed by rules which require that the meetings are held at least one per three months.

By the end of the year, 21 out of the 34 planned activities were implemented as changes in the administrative documents and rules were made, orders were issued, changes were made in the usage of the existing information systems and data bases, committees and working groups were established, information was published on the Intranet of the plant on a regular basis. Following the implementation of the Programme for Safety Culture Enhancement, two discussions in focus groups on the topic of Leadership were held. The aim was to discuss the best methods to create environment in which the personnel would actively contribute to achieving the objectives and task performance. A special attention was paid to the qualities which every plant manager should possess to be a leader. The results from discussions are to be analysed and used to identify measures for establishing leadership skills of managers at different levels.

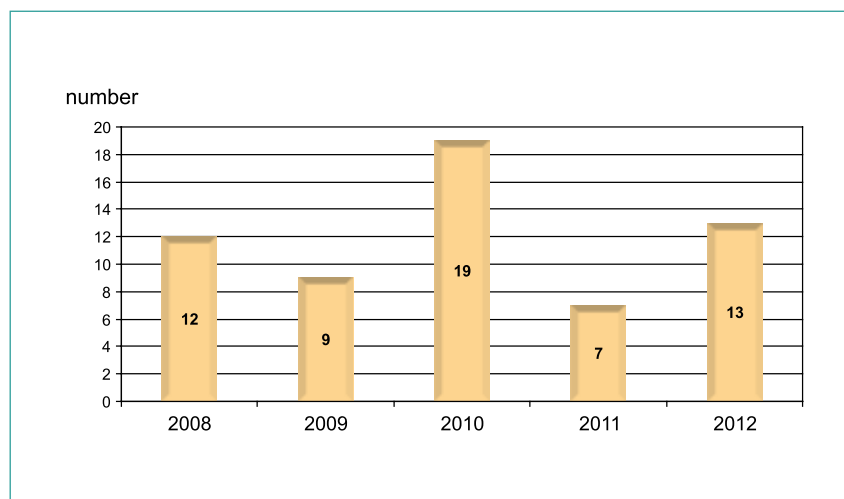
The year 2012 was marked by the OSART Mission. The members of the Safety Culture Council took active part in both mission preparation and performance. Although the safety culture is a part of all the activities and is reviewed in all areas, the topic was discussed in details in the Management, Organization and Administration Area. Thus, the Council members took part in the self-assessment through development of a number of factors and criteria, reviewed documents, processes and interfaces in the plant and EP-2 in particular in order to achieve compliance with the requirements of the IAEA standards. As a result, the required corrective measures with deadlines and coordinators were identified.

NUCLEAR SAFETY

13 operating events were registered at Kozloduy NPP in 2012 and reported to the BNRA. All the events were classified Level "0" which is below the INES scale (no safety significance).

Unit 6 experienced one unplanned reactor scram throughout the year – on 23 October. The previous reactor scram on Unit 6 occurred on 21 March 2010.

Events reported to the Bulgarian Nuclear Regulatory Agency according to the INES scale

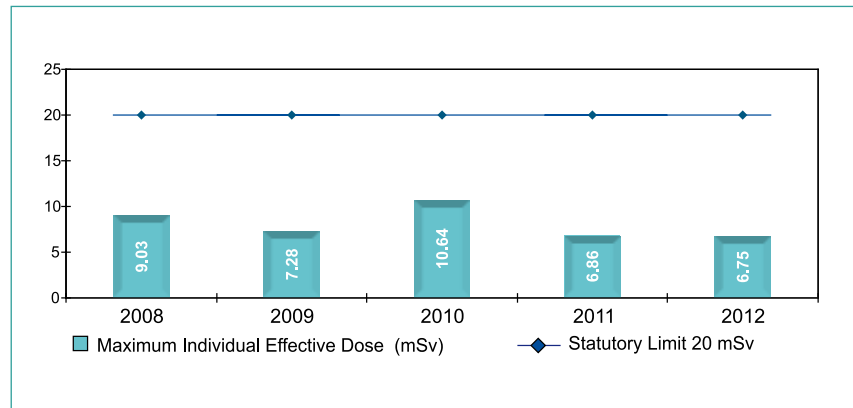




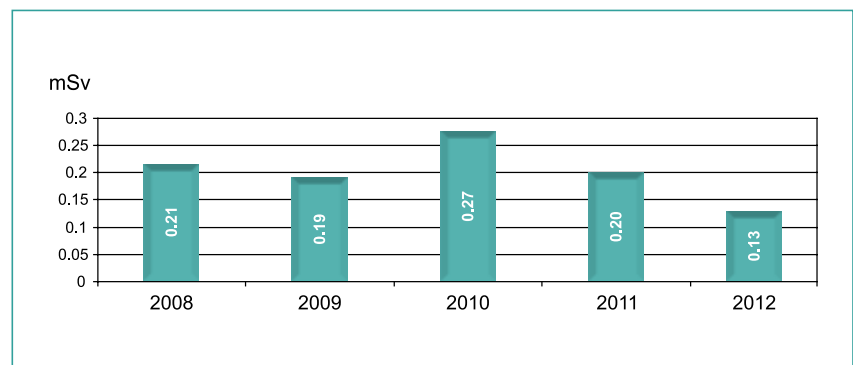
RADIATION PROTECTION

In order to maintain and raise the level of the staff and public radiation protection, Kozloduy NPP implements a policy of systematic application of the ALARA (As Low As Reasonably Achievable) Principle, which includes continuous improvement and optimization of the measures to minimize the ionizing radiation harmful effect. The policy efficient implementation is based on the staff training and motivation, application of good practices from the plant and international operating experience, preliminary planning and preparation of annual outage activities, analysis of completed activities, and accomplishment of reliable and efficient radiation monitoring. As a result of the efforts made, the annual values of the individual and collective doses throughout 2012 once again rated Kozloduy NPP one of the leading nuclear power plants. The maximum individual dose for the last year is 6.75 mSv (33% of the annual limit stipulated by the regulations). The average individual dose for the personnel is 0.13 mSv (compared to 0.20 mSv in 2011). The average collective dose for the two operating units, WWER-1000, is 0.181 manSv/unit for 2012. According to data from the WANO (World Association of Nuclear Operators) Annual Reports, this value is approximately three times lower compared to the average value of that indicator, 0.54 manSv/unit, in power plants with pressurized water reactors.

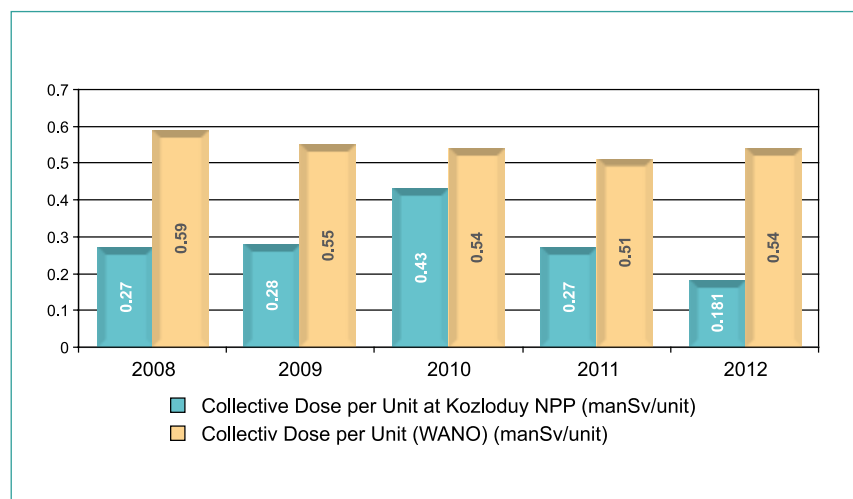
Maximum Individual Effective Dose in the Kozloduy NPP Radiation Controlled Area



Average Individual Effective Dose in the Kozloduy NPP Radiation Controlled Area



Collective dose per Unit (WANO)



GASEOUS AIRBORNE AND LIQUID RADIOACTIVE DISCHARGES

One of the Radiation Protection objectives is to limit the harmful effects of the ionizing radiation on the public and environment and maintain it as low as reasonably achievable. In that respect, Kozloduy NPP aims to strictly control the technological processes, prevent uncontrolled releases of radioactive substances to the environment, and monitor the liquid and gaseous emissions to the environment reliably and in a wide range.

The stipulated limit on public dose exposure due to emissions to the environment is 250 μSv , annual individual effective dose. In order to optimise the Radiation Protection at Kozloduy NPP, reference levels have been established (50 μSv for liquid and 50 μSv for gaseous discharges). In compliance with those reference levels the maximum concentrations of radioactive substances in the plant waste air and waters have been determined, approved by the BNRA, and agreed by the Ministry of Health and Ministry of Environment and Water.

For the last years Kozloduy NPP successfully implemented several projects with respect to enhancement of the radiation monitoring of liquid and gaseous discharges. Currently an on-line sampling and reliable measurement of all the radiologically important



items is supported at the plant. Since the accession of Bulgaria to the European Union the data on the discharges throughout the year are reported to the European Commission.

Again, in 2012 the concentrations of radioactive substances in the gaseous discharges to the atmosphere were considerably lower compared to the limit. The discharges of radioactive noble gases were about 2% of the reference level for the site, aerosols discharged were 3% of the reference level, and ^{131}I discharges were below 1% of the reference level.

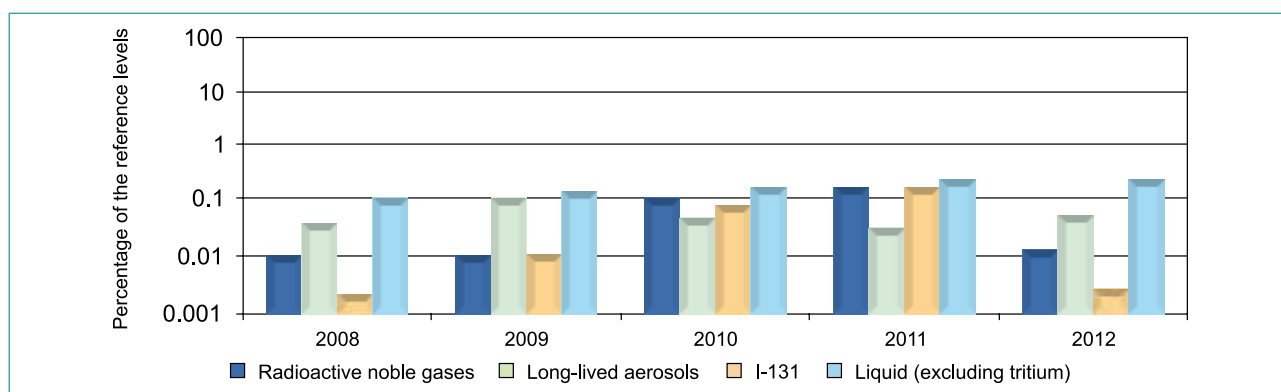
For three years now Kozloduy NPP determines the concentration of carbon 14 (^{14}C) and tritium (^3H) in

the gaseous discharges from Units 5 and 6. The discharges of ^{14}C were 2.8%, and discharges of tritium were 0.3% of the corresponding annual limits.

In 2012, the concentration of radioactive substances in the liquid discharges was also considerably lower than the reference levels. The total activity (without tritium) of the waste waters discharged into the Danube River was about 5% of the approved reference level. Tritium activity in the liquid discharges was about 13% of the annual limit.

As for the past years, the concentration of radiologically important alpha and beta emitters in the liquid and gaseous discharges is negligibly low.

Activity of gaseous and liquid (excluding tritium) discharges throughout the last years presented as a percentage of the reference levels





RAW MANAGEMENT

During 2012, 888 m³ of solid radioactive waste (RAW) were generated, the entire amount being transferred to the Specialized Enterprise Radioactive Waste of Kozloduy.

Regarding liquid waste, the

generated RAW amounted to 269 m³, and 418 m³ were transferred for processing.

The thematic inspection conducted by the BNRA on the implementation of the RAW management activities and absence of comments and

recommendations on behalf of the Agency to Kozloduy NPP prove the adequacy of the methods applied for solving the problems with the radioactive waste.

SPENT FUEL MANAGEMENT

Spent nuclear fuel (SNF) at Kozloduy NPP is stored in compliance with all safety requirements. After being kept for a certain period in the Spent Fuel Pools, the fuel is transferred to the wet spent fuel storage facility (WSFSF) which is common for all units. Spent nuclear fuel from Units 1, 2, 3 and 4 loaded in Constor 440/84 casks is stored in the Dry Spent Fuel Storage Facility (DSFSF). Part of the Kozloduy NPP spent fuel, following the storage in the WSFSF, is returned to Russia for reprocessing and long term storage.

In 2012, 348 spent fuel assemblies from Units 3 and 4 and 36 ones from Unit 6 were transferred to the WSFSF.

720 WWER-440 spent fuel assemblies were sent to Russia and 84 assemblies were loaded in the DSFSF.

Totally 21 inspections of the SNF



at Units 3, 4, 5 and 6, WSFSF, and DSFSF were conducted in

2012 by the regulatory bodies, BNRA, IAEA, and EC.

PHYSICAL PROTECTION

The NPP physical protection system provides for the necessary technical and organizational measures for effective prevention of illegal impacts or violations of nuclear facilities, nuclear material or radioactive substances. Rigorous access regime is established on the territory of the facilities guarded by the Regional Police Department "Kozloduy NPP" in compliance with legal requirements according to which

only individuals who have access cards, and permits for work or stay in the nuclear power plant are granted access. Modern alarm systems and facilities are installed and maintained. Throughout the year the video surveillance and access control systems were extended with additional stations. New communication centre was established on EP-2 territory. Modernization and integration of the National Early Warning

and Notification System with the Kozloduy NPP warning and notification systems have started within the Urgent Protective Action Planning Zone as well as building a unified radio communication system for rescue activities aiming at improving interactions between Kozloduy NPP, Ministry of Interior, Ministry of Economy, Energy and Tourism, Ministry of Health, BNRA, and Bulgarian Energy Holding.

EMERGENCY PLANNING AND PREPAREDNESS

The activities in the field of emergency planning and preparedness at Kozloduy NPP are considered in the On-site Emergency Plan. This field was reviewed in 2012 by WANO, European Commission representatives and the OSART Mission team.

A general emergency exercise on the scenario "Accident with Unit 6 steam generator header break, steam generator damping valve controller opening and failure to close, and radioactivity released

into the environment" was conducted in June 2012. During the exercise real evacuation and transportation to the town of Kozloduy of 629 people from the plant administrative buildings was conducted.

Two unexpected drills on alerting and reporting for work beyond the working hours of the individuals on duty under the Emergency Plan for the respective period, and four drills jointly with the BNRA Emergency Centre were conducted.

Apart from the individuals on duty under the Emergency Plan, Kozloduy NPP sanitary group and the duty shift of NPP Fire Safety and Civil Protection Regional Department took part in the unexpected drill with an emergency event of "Fire in Oil Tank 5TA20B01 in Room 5A113 of Unit 5 tank room, level 0.00".

No operational events that could result in Kozloduy NPP On-site Emergency Plan activation were registered in the nuclear power plant during the year.

FIRE SAFETY

In compliance with the current international and national requirements, the Fire Safety at the Company is ensured based on the required organizational and technical measures.

As a result of a consistent maintenance and development of high Fire Safety Culture and based on the reliability of the technical measures implemented there has been a considerable reduction of the risk of fires and a timely detection and suppression of fires is ensured as well as mitigation of consequences. Throughout the last year, no fires have occurred on the site of Kozloduy NPP.

The high level of Fire Safety at Kozloduy NPP PLC has been proven in the course of the comprehensive review conducted



by the State Control Authority for Fire Safety and Civil Protection.

RADIOECOLOGICAL MONITORING

The scope and content of the radioecological monitoring, as well as controlled parameters are stipulated in a long-term programme agreed by the Bulgarian regulatory and supervisory bodies – BNRA, National Centre of Radiobiology and Radiation Protection (NCRRP) at the Ministry

of Health (MH), and Executive Environment Agency (ExEA) at the Ministry of Environment and Water (MEW). The Programme fully complies with the relevant National and European regulations including Article 35 of the EURATOM Treaty, Recommendations of EC 2000/473/ EURATOM and 2004/2/

EURATOM. The radioecological monitoring performed by Kozloduy NPP encompasses all the basic environmental components (air, water, soil, vegetation, milk, fish, agricultural crops, etc.) within a 100-km radius of the plant on Bulgarian territory.

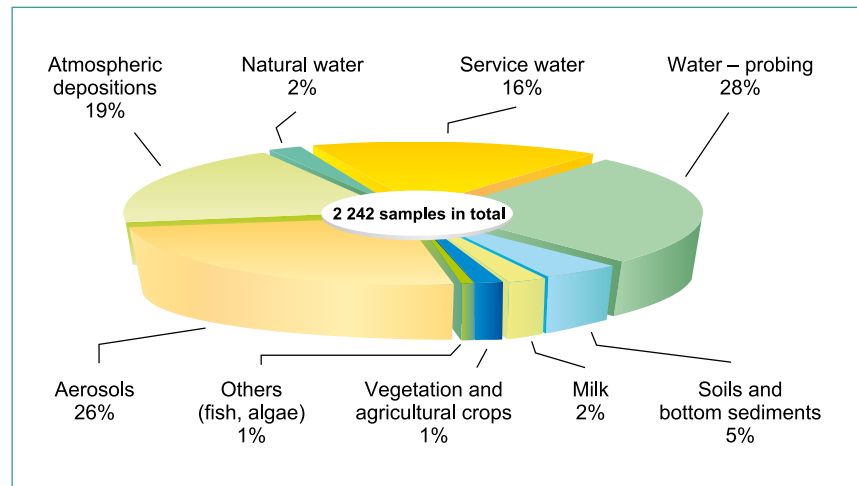
The Monitored Zone includes



the Plant industrial site territory, 2-km Precautionary Action Zone (PAZ), 30-km Urgent Protective Action Planning Zone (UPAPZ), and control points within a 100-km radius of the NPP.

The monitoring for 2012 involved more than 4 000 radioactivity analyses of 2 242 samples in total from different environmental objects. This exceeded the respective scope in a number of analogous laboratories in EU Member States and other countries around the world. The quality of the analyses and measurements conducted is guaranteed annually by taking part in prestigious international interlaboratory comparisons involving reference samples organised by IAEA – Vienna, the Federal Office for Radiation Protection BfS (PTB) – Germany, the World Health Organisation (WHO) – Paris, and the National Physical Laboratory (NPL) – Great Britain. The reports demonstrate the good laboratory practice proven throughout the years with guaranteed accuracy and reliability of analysis results. Since November 2005, the Radioecological Monitoring Department has been participating in the World Network of the Analytical Laboratories for the Measurement of Environmental

Sampling structure (%) as part of the overall radio-ecological monitoring for 2012.



Radioactivity (ALMERA) – IAEA annually taking part, along with 124 laboratories from 78 countries, in laboratory competence tests and complying with all the requirements.

The results regarding the radiation indicators of the analysed samples from the environment in the vicinity of the plant throughout 2012 were within the background levels specific for the region. No adverse effects of the nuclear power plant operation were detected. The human-induced activity levels detected were much below the permissible limits for the relevant indicators and objects. The radiation situation was

completely favourable. Facilities from the industrial site of the Kozloduy NPP are also subject to a comprehensive radioecological monitoring – ground water, aerosols, atmospheric depositions, soils, bottom sediments, etc. A comprehensive annual report on the radioecological monitoring including an analysis of all the results throughout the year is submitted to the BNRA, NCRMP-MH, and ExEA-MEW. The results of the internal radiation monitoring are verified with the independent radioecological studies under programmes of the MEW and NCRMP-MH.

The gamma background levels at the measurement points of the plant industrial site and the measurement points within the 100-km zone for 2012 were fully comparable with and did not differ from the natural gamma background specific for the region. The atmospheric air-induced activity throughout the year was of values close to the background ones (at average $2.3 \mu\text{Bq/m}^3$) and much below the permissible limits according to the Basic Standards for Radiation Protection Regulation of 2012.

The data are comparable to the ones from previous years and are within the natural limits for this





specific radiation parameter.

The total beta activity in the open water basins – the Danube, Ogosta River, Tsibritsa River, and Shishmanov Val Dam is between 0.018 and 0.084 Bq/l, which is 16% of the limit (0.5 Bq/l). The tritium concentration in the open water basins samples is close to the minimum detectable activity of 6.3 Bq/l.

The total beta activity measured in the local drinking water sources varies between 0.031 and 0.075 Bq/l which is much lower than the permissible limits for drinking water defined in Regulation No.9/16.03.2001. The tritium concentration is within the minimum detectable activity range, averaging 4.8 Bq/l.

The activity of ^{137}Cs measured in

the soil surface layer is between 1.3 and 48, averaging 13 Bq/kg (dry weight), and of ^{90}Sr – from 0.3 to 3.8 Bq/kg. Those values are specific for the soils in the region and lower compared to other country regions. The vegetation analysed shows normal induced activity – ^{137}Cs – max. 2.6 Bq/kg and ^{90}Sr – max. 2.1 Bq/kg (dry weight).

MONITORING OF PUBLIC DOSE EXPOSURE

For calculating the additional public dose exposure verified and validated modelling codes for evaluation are used. They are based on the CREAM methodology adopted by the European Union (EU) and have been adapted to the geographical and hydrological specifics of the Kozloduy NPP area. For 2012 the total value of the maximum individual effective dose for the population within the monitored zone due to liquid and gas and aerosol releases in the atmosphere, taking into account

the contribution of ^{14}C and ^3H was 5.8 $\mu\text{Sv/a}$ which was negligibly low compared to the annual dose limit for the public (1000 μSv) according to the Basic Standards for Radiation Protection of 2012. The collective dose for the population within the Kozloduy NPP 30-km Urgent Protective Action Planning Zone was 0.031 manSv.

The low level radioactive discharges from Kozloduy NPP determine dose exposure values of negligible radiation risk for the population within the plant area. The average

additional dose exposure for the population within the 30-km Urgent Protective Action Planning Zone is about 500 times lower than the one originating from the natural background (2 400 μSv). During the last 5 years the values of the maximum individual effective dose for the public vary within the range of 4 – 7 $\mu\text{Sv/a}$ which is below the level for release of activities from regulatory control – 10 $\mu\text{Sv/a}$ according to the Basic Standards for Radiation Protection Regulation of 2012.

HEALTH AND SAFETY AT WORK

Responsibility for personnel is also measured by management's efforts to maintain health and safety at work, and ensure protection and professional risk prevention. For that purpose, Risk Assessment Programmes, harmonized with IAEA recommendations, international practice, and national regulations are being developed by Kozloduy NPP. The programmes address all activities related to the industrial safety and obligations incurred by the Health and Safety at Work Act and subordinate legislation. An important stage is the focus on prevention and encouragement of safety improvement and health protection of the employees. Consistent efforts are made to maintain personnel training and awareness regarding the

adherence to the health and safety regulations.

Working environment parameters are periodically being measured by laboratories to eliminate or limit as much as possible the harmful factors. Compliance with regulatory requirements is assessed, and corrective measures prescribed, if required. The indicators, characterising industrial injuries at the nuclear power plant continued to maintain low values. The plant industrial injuries factor is 0.4 and it is lower than the average value of 1.63 for the branch and the value of 0.75 for the country.

Health and safety at work are being ensured and maintained at Kozloduy NPP. Nuclear power plant employees are provided with personal protective equipment,

free food, shortened working hours, compulsory occupational accident risk insurance of groups of workers of higher occupational hazard.

Systematic risk assessment in the work place is made, and implementation of prescribed measures is regularly reported. As a result, in the last 5 years a downtrend of workdays lost due to occupational injuries, and lessening coefficients and indices characterizing occupational traumatism have been established at Kozloduy NPP.



ENVIRONMENTAL PROTECTION – NON-RADIOLOGICAL ASPECTS

As a nuclear facility operator, Kozloduy NPP PLC performs continuous, systematic and overall monitoring of activities, products and services that exercise negative influence on environment and health of the public in non-radiological aspect. The activities associated with environmental protection and management are an integral part of the Company Integrated Management System and are implemented in compliance with the national environmental legislation and conditions of permits issued by the environmental authorities to Kozloduy NPP.

In 2012, following the request of the Executive Environment Agency, documents were submitted to review the permit for greenhouse gas emissions quotas trading. A new plan for annual emissions monitoring was developed.

In pursuance of the permit conditions for operation of an enterprise of high possible risk, the development of an Analysis and Quantitative Risk

Assessment of occurrence of major accidents with hazardous chemical substances on the territory of Kozloduy NPP has commenced.

In connection with the forthcoming connection of waste water from the open switchyard of Kozloduy Hydroelectric Power Plant with the Discharge Canal (hot canal) – 1 required documents were prepared and the permit for waste water connection with the Danube River through the Discharge Canal – 1 and Discharge Canal – 2 was changed.

In pursuance of the Non-radioactive Waste Activity Management Programme and the permit for actions with non-radioactive waste, 27 specialized bins for separate collection of oily waste were purchased in 2012. Disposal of 23 t depreciated non-hazardous materials in the Solid Domestic Waste Depot was organized in the town of Vratsa. The following reports were developed in 2012: Environmental Impact Assessment Report (EIAR) and Compatibility Asse-

ssment Report for construction of a Facility for Treatment and Conditioning of Solid Radioactive Waste with a high volume reduction factor at Kozloduy NPP. The reports were submitted to the Ministry of Environment and Water (MEW) for approval.

In connection with Decision No.EO-3/2012, issued by MEW, last year a procedure was started for environmental assessment of the specialized detailed spatial plan of the Precautionary Protective Action Zone around Kozloduy NPP.

Throughout the year over 250 samples were taken and analysed from surface, waste and underground waters in implementation of the self-performed non-radiation monitoring programme. It was evident from the results that there was no upward trend in the controlled indicators values, no significant increase of allowed limits was registered, and the values were similar to the ones from the previous years. The annual report on the results from the plant environmental non-radiological monitoring within Kozloduy NPP region was submitted to the Executive Environment Agency and Regional Inspectorate of Environment and Waters (RIEW) – Vratsa.

The adherence to the requirements for the company environmental protection is controlled through regular internal walk downs and reviews. MEW, RIEW – Vratsa and Danube Region Basin Directorate performed 8 scheduled ecological inspections that asserted no misdemeanours. The conclusions of the supervisory authorities confirmed that prompt and adequate measures to prevent and resolve the ecological issues were taken by Kozloduy NPP.



The Operational Safety Review Team (OSART) Mission of the International Atomic Energy Agency to Kozloduy NPP Units 5 and 6 was conducted in the period from 26 November to 13 December 2012. The OSART Mission is a peer review carried out by international experts in the following areas: Management, Organization and Administration; Training and Qualification; Operations; Maintenance; Technical Support; Operational Experience; Radiation Protection; Chemistry; Emergency Planning and Preparedness. Safety Culture was an important aspect to be assessed by the experts in all areas in the course of the mission. The Bulgarian Government requested this OSART Mission to Kozloduy NPP Units 5 and 6 in 2008. A programme with activities to be performed as a preparation for the mission was approved with the aim of approaching high level of plant operational safety. The programme was expanded with measures resulting from the preparatory meeting for the Mission, from the WANO (World Association of Nuclear Operators) Technical Support Missions, from the self-assessment performed in the different areas of the review as well as from the independent assessment of the plant preparedness for the Mission.

A steering committee was formed to guide and direct the activities included in the programme throughout the year and task force teams were assigned to implement the activities planned.

The review of the plant preparedness for the mission and its staff was the key element for the successful results of the OSART Mission. The WANO Moscow Centre arranged and performed a one-week Technical Support Mission on the Preparation for the OSART mission at Kozloduy NPP at the end of February and the beginning of March 2012. The reports prepared during the mission facilitated the efforts of the personnel in the Electricity Production-2 to bring



the equipment condition and the way the activities were performed in accordance with the IAEA standards.

In September and October 2012 a series of training inspections were performed at the plant site in the different areas to be reviewed aimed at consulting and performing an independent assessment by an external consultant of the Kozloduy NPP preparedness for the forthcoming OSART mission. The findings and recommendations had been used to identify specific measures which were implemented.

A theoretical training for more than 1 600 Kozloduy NPP workers and employees (operations personnel, maintenance personnel, and managerial personnel) was performed according to an approved programme and preliminary prepared training materials aimed at preparing the staff for the forthcoming mission. Thematic interviews related to the mission methodology, Safety Culture, behaviour, communication and interaction during the mission were conducted. The issues raised were discussed and practical training via actual plant walkdowns and interviews was conducted. Current information about the mission was posted on the plant Intranet,

additional information booklets and materials were circulated. The activities on the preparation of the advance information package for the mission were planned and arranged in a timely manner.

The mission provided Kozloduy NPP with an objective assessment of the plant status in terms of compliance with the international operational safety standards; recommendations and suggestions for improvement in areas where performance falls short of international best practices were made; and it provided all experts of the teams with opportunities to broaden their experience and knowledge. At the same time, the mission provided all the IAEA Member States with information about the good practices identified in the course of the review of Kozloduy NPP.

On completion of the review, the team leader submitted to the plant executive director the preliminary OSART report with the IAEA team's main observations and conclusions. The report summarizes the recommendations and suggestions made, and good practices and strengths identified. The final OSART report shall be submitted to the Bulgarian Government in a three-month period.

INVESTMENT PROGRAMME

The 2012 Investment Programme of Kozloduy NPP PLC amounts to BGN 88 million self-financing. It is a part of the 2012-2014 Company Business Plan updated with a Decision of the Board of Directors of the Bulgarian Energy Holding. The expenses under the 2012 Investment Programme financed by company own resources amount to BGN 66 million.

Investment projects of considerable importance for the company have been launched – continuation of the nuclear facilities modernization process and safety enhancement during their operation.

The measures on Kozloduy NPP safety maintenance and continuous improvement remained main priority in 2012. The measures are implemented in compliance with the Safe Use of Nuclear Energy Act and pursuant to the terms and conditions of the licences and permits issued by the authorized supervisory and regulatory bodies. Some of the most important measures in this respect are:

- Undertake a project on the Installation of a temperature control in the reactors of Kozloduy NPP Units 5 and 6 which will result in better evaluation of the reactor pressure vessel state during accident conditions including severe accidents and adequate decision-making for accident management.
- Retrofitting the control panels in the Control Rooms of Circulation Pump Stations 3 and 4. As a result of the activities performed, the reliability of the facility control and alarm relay logic, housekeeping and maintainability of the control panels have been improved.
- The gradual acceptance of the reports under the Project on the Update of Level 2 Probabilistic Safety Analysis for full power conditions, and expanding the scope for low power and shutdown

modes of Kozloduy NPP Units 5 and 6 continues.

- Modelling of radiation-induced reactor pressure vessel degradation for an expected 60-year operational lifetime and validation based on factual experimental data. The project is undertaken under a contract with the Bulgarian Hydrogen Society within the Seventh Framework Programme of the European Commission.

- Supplies of important spare parts with long operational lifetime have been implemented. The provision of these spare parts is aimed at reducing the risk of longer downtime if corrective maintenance is required and eliminating the unplanned downtime not included in the outages. Advanced control rod housings CRD-3, spare parts for main coolant pumps maintenance, spare parts for valves and PERSTA controllers, etc. have been delivered.

Another key project of strategic importance of the Company including a series of measures on Units 5 and 6 lifetime extension beyond their design lifetime with 15 to 20 years is ongoing.

- In 2012 the first stage of the Contract on the Comprehensive study of the actual status and assessment of the rest lifetime of the equipment and facilities at Units 5 and 6 was completed which was a licencing condition for the nuclear power units' operation. The aim was to justify the terms and provide the required measures on ensuring the lifetime of the structures, systems and components until the expiry of the current Operating Licences in 2017 for Unit 5 and in 2019 for Unit 6 respectively, and considering the prospect for long-term operation. The 2012-2014 Company Business Plan provides for resources for the implementation of the project first

stage: Comprehensive study of the Actual Status and Assessment of the Rest Lifetime of the Equipment and Facilities of Units 5 and 6. The completion of the second stage requires a Programme on the preparation of the units for their lifetime extension to be developed and implemented. The completion of these measures is a prerequisite for the Units 5 and 6 operating licence renewals which will ensure electricity generation and economic benefits to the Company and end consumers for a long time.

- A contract on the design, supply and installation of 0.4 kV main power supply switchgear, back-up safety system switchgear at Units 5 and 6 and switchgear in the balance-of-plant systems was signed. The project implementation will result in improvement of facilities' operation and design lifetime extension and it is planned to be completed in 2014. The project for Units 5 and 6 available capacities improvement is also related to the activities of their lifetime extension.

In 2012 a General Concept of thermal power uprate of Kozloduy NPP Units 5 and 6 up to 104% was developed. The required modifications and changes of the main facilities will increase the electricity generation effectiveness and ensure the units' long-term operation. Part of the activities started in 2012. A retrofitting of the valve wrench for tightening and untightening the turbine stop valves was completed with the aim of improving the heat exchange and equipment operation related to power uprate of the reactor facility up to 104%. In December 2012 a contract on the replacement of the equipment and software of the in-core monitoring I&C system at Units 5 and 6 was signed and should be completed in 2014.

Throughout 2012 the gradual

implementation of measures under the Kozloduy NPP Energy Efficiency (EE) Programme which was developed in compliance with the existing obligations of the Company pursuant to the Energy Efficiency Act (EEA), the applicable regulations and EE Action Plan of the Republic of Bulgaria, continued aiming at achieving a stable trend towards improvement of the energy consumption indicators. All construction and installation works on the "Replacement of

the water supply system stage I – EP-1 site using an excavation-free technology in the existing water supply channels" were completed. The activities on the "Replacement of the water supply system stage II – EP-2 site" are being implemented together with the "Replacement of UJ pipelines, external Fire Protection Ring". Investment activities on the modernization and safety improvement of the Spent Fuel Storage Facility and retrofitting

of the buildings and areas of the Switchyard were performed. Measures for maintenance and improvement of the security and physical protection of the plant and other balance-of-plant facilities were implemented. Throughout 2012 the applied long-term assets with own resources amounted to BGN 52 million and 3 facilities were approved by governmental acceptance committees and 12 – by plant acceptance committees.



DECOMMISSIONING

In 2012, the preparatory activities for decommissioning (DE) of the 440-megawatt shutdown units of Kozloduy NPP, were performed in compliance with the approved plans. The work under a number of European Bank for Reconstruction and Development (EBRD) projects was finalized – Project 5g "Independent Assessment of Intermediate Safety Analysis Report," Project 6e "Design, Supply and Installation of a Weighbridge,"

Project 8c "Decommissioning Material Management Strategy," Project 12b-2 "Supply of Equipment for Size Reduction of Units 1 and 2 Turbine Hall," Project 33 "Development of Units 1 and 2 Phase I Updated Decommissioning Plan," Project 36 "Safety Analysis Report (SAR) for Units 3 and 4 Operation as RAW Facility Management," Project 37 "Units 1 and 2 Decommissioning SAR," etc. Activities under key projects that

have also been funded or co-funded by the EBRD are being implemented – commissioning of Project 1a and 1d "Design and Construction of a Dry Spent Fuel Storage Facility", implementation of Project 5b "Facility for Treatment and Conditioning of Solid Radioactive Waste with a High Volume Reduction Factor", implementation of Project 5c "Environmental Impact Assessment for Project 5b", etc.



Projects 15a "Thermal Power Plant for Steam Generation", and 15b "Environmental Impact Assessment for Project 15a" are in the process of preparation.

In July 2012 Grant Agreement 38 was signed between Kozloduy NPP, SE RAW and the European Bank for Reconstruction and Development for novation of a part of Kozloduy

NPP decommissioning projects to SE RAW which was performed in compliance with the Agreement Terms.

On 12.12.2012 Kozloduy NPP representatives took part in the Assembly of Donors meeting where they provided information about project progress and utilization of International Decommissioning

Support Fund for Kozloduy NPP Units 1-4.

Under Council of Ministers' Decree No. 1038 of 19 December 2012, Kozloduy NPP Units 3 and 4 were announced as radioactive waste management facilities subject to decommissioning and novated to SE RAW to freely use and manage.

INTERNATIONAL COOPERATION

Nowadays, assurance of higher and higher safety levels and reliability of nuclear power is achieved in terms of intensive international cooperation, partnership and exchange of experience.

Kozloduy NPP is transparent in the achievement of its strategic goals through the implementation of a number of international projects, proactive cooperation with international organizations, and participation in international activities. During the elapsed year Kozloduy NPP continued its cooperation with competent international and national agencies and non-governmental organizations as the World Association of Nuclear Operators (WANO), FORATOM, BULATOM, etc. With respect to WANO, a proposal was made to the Moscow Centre of the Association for joint activities and a project to study the possibilities and implementation of a solution for cooling and corium catching in case of severe accidents for WWER-1000 reactors.

In 2012 experts from the Bulgarian nuclear power plant took part in a number of international and national conferences, workshops and meetings. Kozloduy NPP representatives took part in a consecution of missions and reviews of different nuclear power plants, including in Pre-OSART Missions and Technical Support Missions of the Chinese Hongyanhe and Tianwan NPPs, Paks NPP in Hungary, Philippsburg NPP in Germany, the Russian Novovoronezh, Smolensk



and Beloyarsk NPPs, the Ukrainian Khmelnytsky NPP, Brazilian Angra NPP, Dukovany NPP in the Czech Republic, etc.

At the beginning of 2012, the efforts of Kozloduy NPP were focussed on the successful finalization through European Commission Peer Reviews of the exceptionally significant international project – the stress tests conducted in 2011. The Peer Review of the nuclear power plant in Bulgaria was conducted in two stages – during the first stage the National Stress Test Report was reviewed by fields in Luxemburg (6-8 February 2012). BNRA representatives, Kozloduy NPP experts, and representatives of the engineering companies that conducted the stress tests took part in the review.

During the second stage a

European Commission Peer Review was carried out at Kozloduy NPP aiming at National Report on-site verification (12-14 March 2012). A task force was assigned upon Peer Review completion to summarize the results from the stress tests and organize Public Hearing which was conducted jointly with BNRA on 5 July in the town of Kozloduy. The Final Report for Bulgaria was issued. Kozloduy NPP PLC developed and approved a programme for the implementation of the recommendations from the stress tests that is being followed. A National Action Plan was developed upon completion of the European stress tests.

The Bulgarian nuclear power plant has committed to rigorously implement the measures included in the National Action Plan.

NEW-BUILD CONSTRUCTION PREPARATION

On a meeting on 11 April 2012, the Council of Ministers of the Republic of Bulgaria made a decision in principle for undertaking actions for the construction of a new nuclear power unit on Kozloduy NPP site. In order to undertake specific actions with regard to that, Kozloduy NPP has established a subsidiary, Kozloduy NPP – New Build PLC, which was registered in the Trade Register at the Registry Agency on 09.05.2012. The new nuclear power unit will be a reliable and safe energy source of electricity and will contribute to the long-term plan for energy independence of the country, maintenance of acceptable and stable electricity prices, and for the sustainable social and economic development of the region.

The nuclear power unit shall be of the latest generation – III or III+, with installed capacity of about 1200 MW, and the generating technology will be a pressurized water reactor (PWR type), and light water will be used as moderator and coolant.

Considering the reliable and successful operation of nuclear power reactors of the water-water type at Kozloduy NPP, the full capacity of the plant site can be utilized during the construction and operation of the new build, the available infrastructure, and experienced and highly-qualified personnel including.

After the Council of Ministers of the Republic of Bulgaria gave their consent to the construction of the new nuclear unit on Kozloduy NPP site, the Company Board of Directors established a new structural unit – New Build Division to manage the activities on the design, licencing, construction and commissioning of the new power units on Kozloduy NPP site. With the purpose of having the Council of Ministers prepared for making a decision in merit for the construction of a new nuclear unit and starting the licencing process in accordance with art. 45 of the

Safe Use of Nuclear Energy Act, a number of significant projects have been duly commenced:

- Feasibility study for the construction of a new nuclear unit on Kozloduy NPP site. The purpose is to provide objective information about the achieved safety level, technical parameters and economic efficiency of the project, based on which the decision will be made by the competent state institutions on the issue of constructing a new power unit on the site of Kozloduy NPP.

- Study and selection of the preferred site location for the construction of the new nuclear unit on the site of Kozloduy NPP PLC and associated territories in compliance with the current requirements of both national regulations and IAEA standards and recommendations. All environmental aspects that impact nuclear safety and protection of the public from radiological consequences of all operating states as well as for emergency modes of the future nuclear unit shall be addressed and assessed.

- Development of Environmental Impact Assessment (EIA) of the Investment Proposal for the construction of a new nuclear unit

on Kozloduy NPP site. Development of terms of reference for the scope and content of the EIA Investment Proposal is expected and the EIA Report will be developed on its basis. The report shall assess the environmental impact of the new nuclear unit construction on Kozloduy NPP site by considering the cumulative effect of the joint operation of all facilities situated on it. The transboundary assessment and the impact of the investment proposal on adjacent protected territories shall be included into the scope of the Report.

All activities under the three projects are progressing according to schedule and as of the end of 2012 no deviations from the approved schedules were found.

In parallel, according to the requirements of the Bulgarian legislation, the following formal applications were filed:

- Notification of Investment Intention of “Construction of a last generation new nuclear unit on the site of Kozloduy NPP” – to the Ministry of Environment and Water.

- Application for issuing a permit for location identification (site selection) – to the Bulgarian Nuclear Regulatory Agency.





FINANCIAL PERFORMANCE

Kozloduy NPP policy on business and finance management is aimed at achieving efficient and competitive electricity generation ensuring the highest level of safety, providing and maintaining the Company financial stability, effective use and allocation of resources while implementing the Company strategy and attaining Company objectives, high profitability, steady income, and optimum market position.

Kozloduy NPP PLC closed 2012 with very good performance and economic indicators ensuring the Company financial stability despite the imposed regulatory and statutory constraints and also the high intercorporate indebtedness. The Company's profit after the tax expenses amounted to BGN 146 584 thousand at the end of the year (BGN 114 192 thousand for 2011) despite the influence of the following negative factors:

- increase of the Company's quota for electricity sales on the regulated market in compliance with Decision No. TE-021/28.06.2012 of the State Energy and Water Regulatory Commission (SEWRC);
- reduction of the average selling price with 2.2% in comparison with the previous year pursuant to Decision No. Л-17/28.06.2012 of the SEWRC.

Kozloduy NPP reported BGN 847 358 thousand for the past 2012 in operating income. The electricity sales and available capacities had the largest share – 95% of the plant operating income amounting to BGN 805 523 thousand and BGN

404 635 thousand of it (~ 50%) were received from sales on the free electricity market.

As a result of the well-structured business objectives and successful management of the available resources, the Company's operating expenses for the year amounted to BGN 626 108 thousand. Kozloduy NPP honoured its obligations under the 2030 Strategy for Spent Nuclear Fuel and Radioactive Waste Management and in 2012 spent fuel was transported to Russia three times.

In accordance with the Bulgarian legislative requirements, payments to the state and local budget as well as payments to personnel, insurance funds and social security institutions were made. BGN 170 344 thousand were paid as taxes and fees to the state budget, BGN 40 526 thousand were paid to social security institutions and BGN 84 592 thousand were paid to the Nuclear Facilities Decommissioning Fund and Radioactive Waste Management Fund. The obligations under the governmental secured loan from EURATOM for the modernization of Units 5 and 6 were fulfilled in a timely manner.

In compliance with a Decision of the Board of Directors of the Bulgarian Energy Holding, Kozloduy NPP fixed capital was increased pursuant to article 197 of the Commercial Law by BGN 22 830 thousand at the undistributed profits expense through issuance of 2 283 041 new ordinary personal voting shares with nominal value of BGN 10 each.



As of 31 December 2012, the share capital was BGN 124 546 thousand.

Selected key indicators showing the achieved business activity results and evaluation of the Company state and operation in 2012 in comparison with the previous year are presented in the following table:

Nº	Key indicators (BGN thousand)	2012	2011	Change %
1	Total operating income	847 358	853 637	-0.74%
2	Earnings before interest, taxes, depreciation, and amortization EBITDA	345 812	343 729	0.61%
3	Earnings before interest and taxes EBIT	221 250	220 260	0.45%
4	Earnings before taxes EBT	208 340	216 203	-3.64%
5	Earnings per year E	146 584	114 192	28.37%
6	Operating margin EBITDA	40.8%	40.3%	1.35%



The Kozloduy NPP business results are shown in the Company Financial Statements prepared in compliance with the requirements of the International Financial Reporting Standards.

STATEMENT of financial position as of 31st December 2012

	2012	2011
	BGN thousand	BGN thousand
Assets		
Non-current assets		
Tangible assets	1 778 582	1 383 918
Intangible assets	4 896	5 564
Investments in subsidiaries	3 161	1 161
Loans granted to connected persons	19 489	20 000
Receivables from connected persons	-	8 438
Financial assets available for sale	232	232
Non-current assets	1 806 360	1 419 313
Current assets		
Nuclear fuel	235 475	222 459
Inventories	59 136	50 290
Trade and other receivables	42 885	50 960
Loans granted to connected persons	1 488	51
Receivables from connected persons	335 923	157 702
Receivables from tax to the income	4 759	2 345
Cash and cash equivalents	78 985	183 609
Current assets	758 651	667 416
Assets included in disposal groups classified as held for distribution to the owner	25 411	-
Total of assets	2 590 422	2 086 729
	2012	2011
Equity and liabilities	BGN thousand	BGN thousand
Equity		
Share capital	124 546	101 716
Legal reserve	20 376	20 376
Revaluation reserve	433 462	-
Other reserves	976 842	976 842
Undistributed profits	146 585	207 299
Total of equity	1 701 811	1 306 233
Liabilities		
Non-current liabilities		
Loans	275 039	319 289
Deferred sums under construction contracts	466	7 912
Financing	186 516	182 166
Payments under retirement obligations	21 187	19 330
Deferred tax liabilities	90 776	37 287
Non-current liabilities	573 984	565 984
Current liabilities		
Trade and other payables	88 150	90 375
Payments to connected persons	156 560	1 650
Loans	47 438	37 788
Financing	11 575	9 398
Deferred sums under construction contracts	9 969	2 414
Debt provisions for spent nuclear fuel	-	72 221
Payments under retirement obligations	935	666
Current liabilities	314 627	214 512
Total of liabilities	888 611	780 496
Total of equity and liabilities	2 590 422	2 086 729



STATEMENT of comprehensive income as of 31st December 2012

	2012	2011
	BGN thousand	BGN thousand
Electricity sales income	805 523	834 876
Thermal power sales income	2 132	2 308
Income from sales	807 655	837 184
Income from financing	2 730	2 395
Income from services, goods and other sales	36 973	14 058
Costs for materials and consumables	(147 010)	(161 976)
Costs on hired services	(83 156)	(88 104)
Costs for personnel	(165 687)	(148 272)
Depreciation costs	(124 562)	(123 469)
Other costs	(100 742)	(108 014)
Changes in work in progress and other changes	(5 425)	(3 626)
Acquisition of machinery, facilities and equipment under business activity	474	84
Operating profit	221 250	220 260
Financial costs	(22 894)	(10 769)
Financial income	9 984	6 712
Profit before tax	208 340	216 203
Payments for tax to income	(15 449)	(12 736)
Profit of ongoing activities per year	192 891	203 467
Loss of discontinued operations per year	(46 307)	(89 275)
Profit per year	146 584	114 192
Other comprehensive income		
Revaluation of the non-financial assets	481 624	-
Tax to the income referring to the other comprehensive income	(48 162)	-
Other comprehensive income, net income from tax	433 462	-
Total of comprehensive income per year	580 046	114 192





The personnel training and qualification system established at Kozloduy NPP PLC is continuously improved and updated. In order to ensure proper qualification for positions related to nuclear safety and radiation protection, the Bulgarian regulations require for the training organisation to be licenced by the Bulgarian Nuclear Regulatory Agency. Kozloduy NPP PLC obtained this licence in 2006 and renewed it in 2011 (Licence Series CO, registration No.03803). The responsibilities for applying the licence are assigned to the Personnel and Training Centre Department.

The methods and tools to conduct training in an efficient and effective manner are maintained in compliance with the current requirements. The plant Training Centre has modern training facilities available to provide personnel specialised training in order to maintain and improve personnel qualification based on the systematic approach to training.

A full-scope simulator (FSS) for WWER-1000 reactors has been installed and continuously upgraded in compliance with the current state of the reference Unit 6. The WWER-440 multifunctional simulator (MFS) shall be operable until Units 3 and 4 are Kozloduy NPP assets.

In 2012 the existing classrooms and training workshops for the operations and maintenance personnel were better equipped; specialised training rooms on industrial safety, fire protection, etc. were equipped. The existing library is continuously updated with recent literature. An e-library is in the process of development and it shall facilitate the users regarding remote access to information, easy search, copy and print of various information, etc. The training materials are continuously updated and new training courses are developed.

Each year the plant workers and employees as well as the contractors' personnel working

on site are subject to mandatory specialised training in order to improve their knowledge and skills related to the operation and maintenance of the nuclear facilities. Due to the work specifics, a part of the personnel such as the Main Control Room (MCR) operators and reactor physicists undergo a specialised training on the FSS. Simulator training is delivered to Switchyard Shift Supervisor and electrical equipment operations personnel. The scope, duration, training settings, topics, and periodicity of training are specified in the training programmes developed on the basis of the relevant regulatory documentation.

Since the beginning of 2012, 133 individual initial training programmes, 257 individual continuing training programmes, and more than 110 plan-schedules for different personnel groups have been developed. Different training settings and methods are applied based on the planned activities.



Throughout 2012, 1 400 training courses were conducted covering Process Systems and Equipment, Process Modes, Human Factor, Safety and Emergency Planning, Quality Control, Decommissioning and many other areas. These courses covered 77 370 man-hours of training. Over 14 431 man-hours on-the-job training as short-term thematic courses were conducted.

In 2012, the simulator training on the FSS delivered by licenced instructor-operators was mainly focused on topics related to symptom-oriented emergency procedures (SOEP) in terms of their implementation at MCR-5 and MCR-6. Simulator training of 14 515 man-hours was conducted, 11 505 out of which were conducted on the FSS and 3 010 on the MFS.

57 training programmes were developed and implemented for individuals performing activities with sources of ionizing radiation. 701 individuals were trained in

41 courses and more than 4 446 individuals passed initial training for access to the Kozloduy NPP plant at external companies and engineering organizations request. Following the Company's policy on cooperation with the secondary and higher educational institutions in the country, group and individual internship of 213 students was carried out.

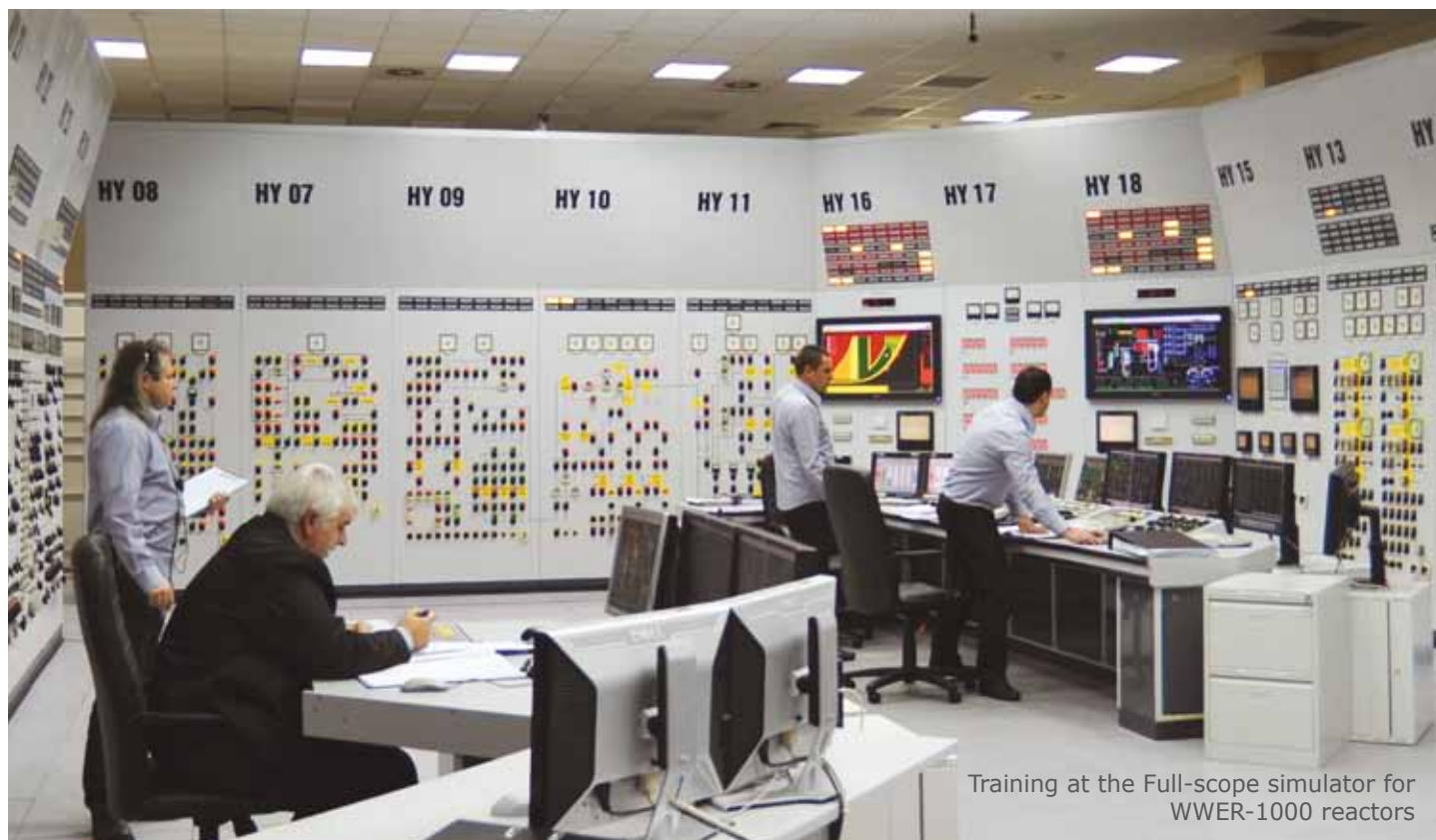
The participation of the nuclear power plant in different scientific and applied projects together with international organizations and recognized companies in the nuclear field is significant.

The FSS modernization project through upgrading the thermohydraulic model and reactor core model was completed in the past year. The upgrading of the simulator control safety systems is in its final stage and will be completed till the beginning of the new training session. The project on the upgrade of the deaerators model and high pressure heaters model is ongoing.

The CORONA project is ongoing and its main objective is establishment of a regional centre of competence for WWER technology and nuclear applications as a part of the EURATOM Programme.

The compliance with the national and international requirements to personnel training and qualification is strictly controlled by the national regulatory authorities (the BNRA and other national institutions) and international organizations (IAEA, WANO). The inspection results show that the activities performed comply with or exceed the requirements of the relevant standards.

This was also verified by the overall IAEA mission of the Operational Safety Review Team (OSART) which was held at the end of the year. The review team recognised a number of good performances and one good practice in the Training and Qualification area and no weaknesses requiring suggestions or recommendations were identified.



Training at the Full-scope simulator for WWER-1000 reactors

Placing its highest priority on ensuring safe, efficient, and environmentally friendly electricity generation, the Kozloduy NPP PLC management seeks to maintain an adequate number of certified staff, perfectly trained and highly motivated.

In order to accomplish this objective, a management system and administrative structure have been implemented ensuring coordination between the safety

requirements, labour conditions, environmental protection, and optimum performance.

The active role of the personnel in achieving the objectives set and pursuing to the policies adopted is a crucial factor in the Company's success. For that purpose, an atmosphere of openness and good communication throughout the organization is established and a feedback on the implementation of good ideas and suggestions is

provided.

In accordance with the IAEA safety requirements, in 2012 a Plan for the number of staff required for 3- and 5-year periods was prepared reflecting the positions and administrative units. The responsibilities of level 1 and 2 managers included in the job descriptions were revised to comply with the departmental organizational policies and procedures.



PERSONNEL PROFILE

Maintaining and developing a professional recruitment system in compliance with the contemporary requirements for the staff working at nuclear facilities is one of the main priorities of the Human Resources Management Policy.

The recruitment process established at Kozloduy NPP provides for assessment of the candidate's competencies to fill a position, assessment of medical and psychological fitness for duty in an

ionizing radiation environment in compliance with the Methodology of the Ministry of Health for Recruitment of NPP Operators based on psychophysiological and psychological characteristics.

At the end of 2012 the number of the Company employees was 4 093. In order to fill the vacant positions from 2011, Kozloduy NPP organized and conducted 90 procedures for recruitment of personnel for 137 positions in

2012. During the last year the public interest in the Company as an employer remained high – more than 4 200 people applied for the vacant positions. The annual average number of advertised vacant positions in the course of the last 4 years is 167 with approximately 3 235 applicants. For a single position the number of applicants is respectively 7 in 2009, 19 in 2010, 21 in 2011, and 30 in 2012. The number of applicants

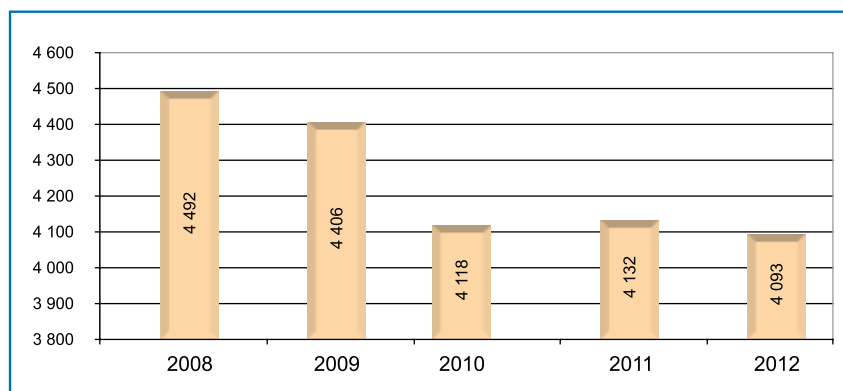
is higher for vacant positions requiring secondary education and vocational education. In 2012 40 such vacant positions were announced and a total of 2 667 applicants participated, i.e. 67 individuals applied for a single job position.

The plant provides career development prospects, therefore, a huge number of young specialists apply for the vacant positions and finally, in 2012, one third of the newcomers in the Company are individuals under 30. The average age of the plant employees is 45, and the average working experience in the Kozloduy NPP is 18 years.

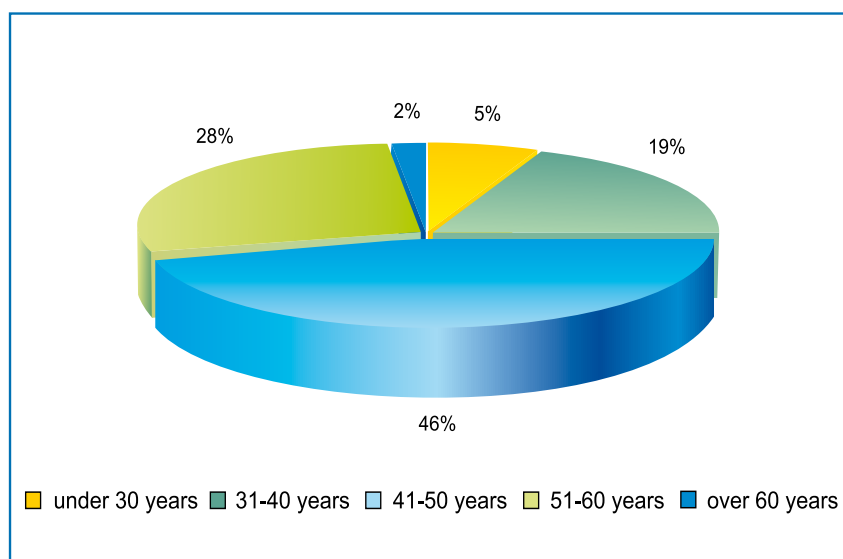
The larger amount of compensations for early retirement remains as an option in the 2013/2014 Collective Labour Agreement signed at the end of 2012. Considering these compensations, 79.17% of all employees approaching early retirement (1st and 2nd category of labour) took this opportunity. Only 13.95% of all employees released from office have left the company on their own initiative and the main part has been discharged upon reaching retirement age.

The minimum required educational level in accordance with the Kozloduy NPP staff list is secondary education. About 22% of all employees have educational levels higher than their job positions require. Therefore, this enables the employees to apply for higher positions complying with the Employer's obligations for personnel career development and use of the expertise gained. 1 808 individuals have a university education, 1 623 individuals have a vocational education, 596 have secondary education and 66 individuals have a primary school education. The employees with primary education occupy mainly positions involved in support services not requiring special qualification.

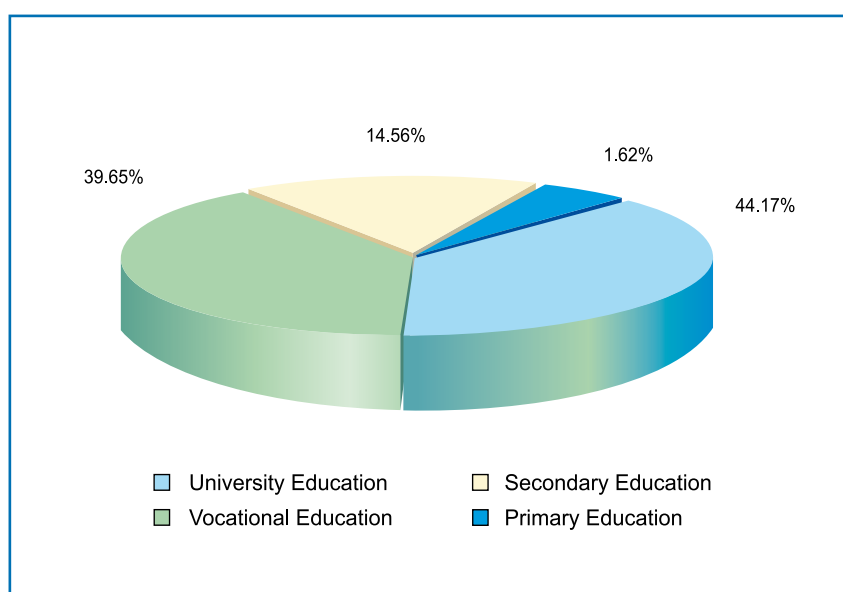
Number of personnel per year



Personnel Age Structure



Educational structure





MOTIVATION OF PERSONNEL

Another important objective included in the human resources management policy is maintaining high level of personnel motivation. A new study of the plant personnel motivation was conducted at the end of 2012. A personnel motivation profile was built, according to which there were 7 motivation subfactors with results below 50%: "Work Performance Appraisal System", "Flexibility in Professional Growth and Career Development", "Change Support – Workplace Security", "Salary and Bonus Fairness", "Common Future Plans", "Bureaucracy", and "Salary and Bonus Rules". An analysis and corrective action plan are planned in these areas.

Establishing and maintaining

an individual work performance appraisal system is amongst the objectives set in the human resources management with the aim of defining the career development needs of each employee and motivating the development of their professional competence. In this regard, in 2012 an administrative procedure on the Individual Work Performance Appraisal of the Kozloduy NPP PLC staff was prepared and updated addressing the following changes:

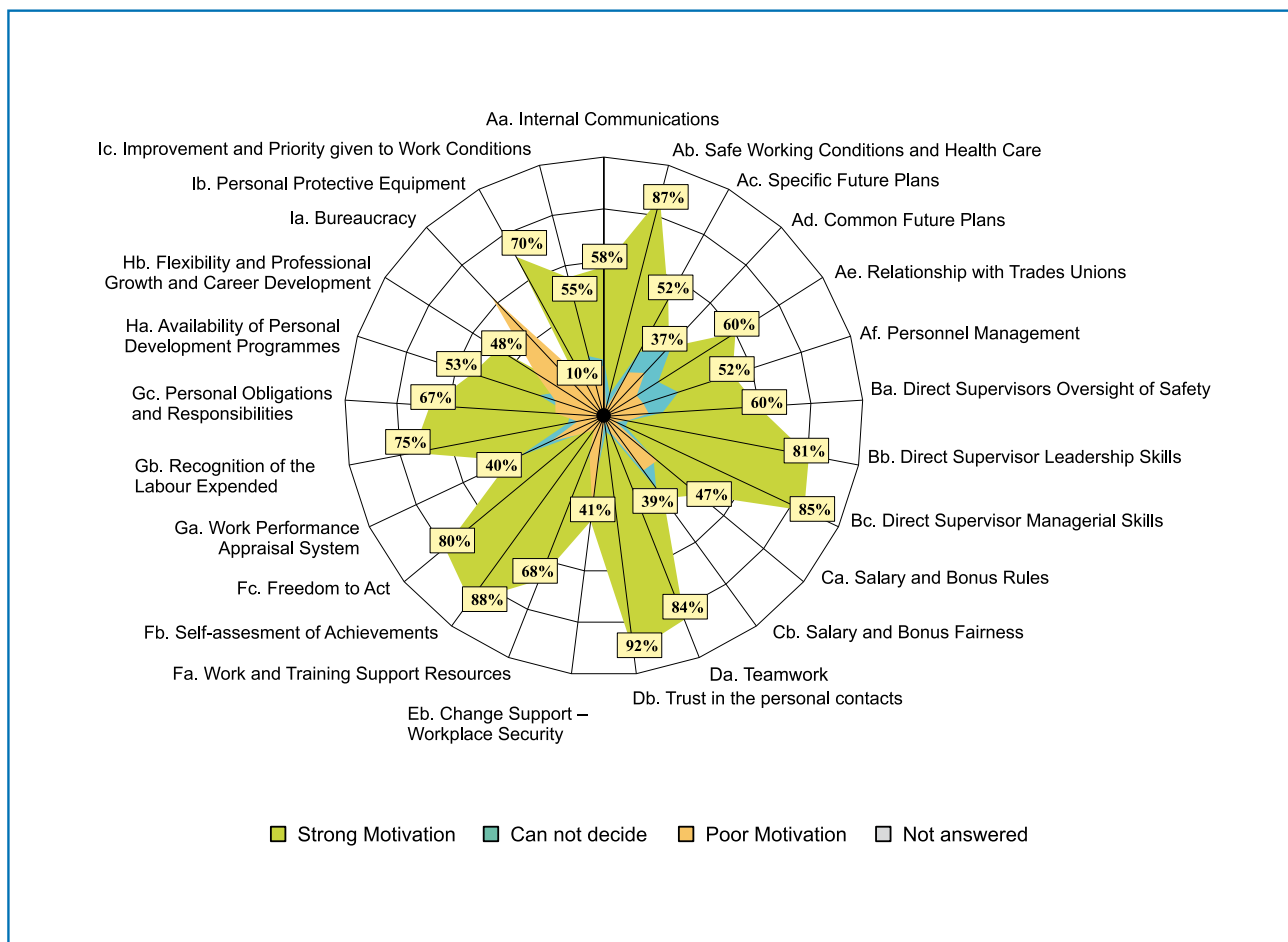
- The number of assessment criteria was increased in the individual work performance form in order to provide a fully comprehensive assessment.
- An individual self-assessment form for each worker/employee

was developed which was similar to the assessment form and it was aimed at providing the employees with the opportunity to assess their performance, express their future goals and provide feedback to the employer.

- The assessment and self-assessment scales were increased from 3 to 5-mark scale with the aim to achieve higher accuracy in the assessment.

- Individual Career Development Plan was prepared as an appendix to the Procedure to encourage the worker/employee career development.

Personnel Motivation Profile





WITH CARE FOR YOUNG PEOPLE

In cooperation with different universities Kozloduy NPP PLC provides the opportunity for students all around the country to take part in paid and unpaid internship under specially developed training programmes prepared by the relevant university. In 2012 for eighth year in a row a summer internship programme was conducted involving students from different universities in the country and abroad on specialities applicable to the plant – nuclear techniques, nuclear engineering, engineering physics, chemistry, physics, electrical power engineering and electrical equipment, automation, control and computation systems, nuclear chemistry, chemical technologies in the nuclear, ecology and environmental protection, etc. In the period from July to August 25 interns worked for 20 working days on preliminary assigned projects in cooperation with their line managers in different structural units of the Company.

The internship of each participant in the programme completed with a presentation of the knowledge gained by the students before their managers. An unpaid group or individual internship was provided as an opportunity for all volunteers. In 2012 a series of internships were undertaken as part of the "New Beginning – from education to employment" Project under the operational programme Human Resources Development of the National Employment Agency. Since 17 February 2012 5 interns had full-time employment for a six-month period in structural units of the Operations Division at Electricity Production-2. As a result of the efforts the interns and their mentors put into their work, the on-the-job training was successfully completed and following the expiry of their internship contracts, the young people became plant employees. Five interns more were employed to work full-time jobs for a six-

month period in structural units of the Commercial Division at the Business and Finance Directorate. Preparation for signing a contract with one more group under the "New Beginning – from education to employment" Project started at the end of the year.

Another practice related to the involvement of young people in the Company is the participation of Kozloduy NPP in the Exhibition "Career Days", organized by the Technical University of Sofia.

Kozloduy NPP participated in the national initiative entitled Manager for a Day for the fourth successive year providing the opportunity for secondary students to gain direct impressions of the managerial work and familiarize themselves with the different career development prospects at the plant.

The Company works in close cooperation with the national universities in order to present the power plant as an attractive workplace for young people.

The principle objective of Kozloduy NPP PLC Communications Policy is to maintain and enhance the public trust and achieve a

high level of public acceptance of the nuclear plant operation. This objective is closely aligned with the great interest in the

nuclear energy and it reflects the objective necessity of keeping the plant employees and the public informed.

INTERNAL COMMUNICATIONS

The internal communications is among the main priorities of the Kozloduy NPP management team. The provision of current information on all important issues and topics in a timely manner is a prerequisite for the improvement of staff motivation in the work process and its awareness of all aspects of the tasks assigned.

Kozloduy NPP has diverse internal communication channels. Among these is the Local Computer Network and all computer users at the nuclear power plant are provided access to it. Users have access to the NPP Intranet where they publish daily data about generated electricity, environmental factors, nuclear power units' state, etc. The Intranet contains headings as Documents, News, Personnel, Civic Activities, Social Services, Information Centre, Sports Events, Cultural Events, etc. The Commentary Heading called "Opinions" is a peculiar forum for exchange of personal

opinions, putting questions to the management on topical issues and giving proposals for solving particular problems. The weekly plant electronic inquiry called "The Issue of the Week" contributes to the plant management in getting the employees' feedback. In 2012, 25 026 answers to questions put by the inquiry were given. Inquiry participants are capable of giving opinions or proposals in their own words.

Annual surveys are conducted to receive feedback from plant employees. In 2012, the following was conducted: annual survey of Kozloduy NPP PLC employees' motivation; survey on the "Kozloduy NPP Employees Opinion and Assessment of Human Error Reporting Motivation"; quality assessment of two focus groups (managerial and executive personnel) was conducted on the issue of "Kozloduy NPP Leadership State" as a part of inquiry survey on "Kozloduy NPP Safety Culture Self-

assessment".

In 2012 Information Display System was built in the main buildings on NPP site. It visualizes data about electricity generation, the environment, and presents information, important news, documents, notifications, etc.

During the period of the IAEA OSART Mission, a daily Newsletter was issued to inform the employees on the progress and other important aspects of the review.

The Public Relations Department shoots educational and documentary films which are published on the Company Intranet, and used as training materials by the Plant Training Centre. In 2012 four educational films associated with the utilization of fire protection equipment, as well as a documentary called "Emergency Preparedness – Guarantee for Confidence" and multimedia for the 25th anniversary of Unit 5, etc. were shot.



EXTERNAL COMMUNICATIONS

To achieve open and timely public presentation of all aspects of the nuclear power plant activity, a lot of effort is focused on dialogue with the external publics – the wide public, the population of the region around Kozloduy NPP PLC, institutions, non-governmental organizations, scientific communities, the coming generation, and professional partners, etc.

The corporate site of the plant is an important communication channel – www.kznpp.org. In 2012, 332 980 visits of the company internet site were registered – around 14% more than the visits in the previous 2011. On that site people can find information about Kozloduy NPP PLC management policies, electricity generation data, news, public procurement and tender notices, vacancy notices, etc. A specialized information package adapted to the peculiarities of children's age is developed. There is a computer game, and winners are nominated and awarded every month.

Another important aspect of communication with external public is the work with media, and it was given the highest priority in 2012. The main activities in that direction covered the preparation and dissemination of press releases and answers to enquires of regional, central or international media, organization of press conferences and briefings, and visits of journalists to the nuclear power plant site.

Publishing of printed editions and video products plays an important role in popularization of nuclear power plant activity. In 2012 information publications were prepared and disseminated freely – the corporate information organ, Parva Atomna Journal, the annual report, leaflets, booklets, and others. The documentary, "Emergency Preparedness – Guarantee for Confidence" was broadcast by the regional cable televisions of Kozloduy and Mizia.

The film was projected in all schools of the town of Kozloduy, it was submitted to the district governors of Vratsa and Montana to be broadcast to the public of the two districts, and it was uploaded on the Company Internet site.

To facilitate garnering personal impressions, Kozloduy NPP gives the opportunity of Bulgarian and foreign citizens to visit other site facilities besides the Information Centre as the nuclear power units Main Control Rooms and the Turbine Halls including. During 2012, kids and students maintained their high interest in the NPP – they represented 48% of all visitors throughout the year, and the journalists were 14% of the visitors.

Round tables, public hearings, working meetings, and others are alternative forms of contact with external public. In 2012 two events of this sort took place – on 5 July, a Public Hearing of the Stress Tests conducted at Kozloduy NPP in 2011, and on 18 December, a Round Table on the Aarhus Convention and Nuclear Energy.

Each year Kozloduy NPP takes part in regional and national charity and sponsor initiatives. In 2012 the nuclear power plant granted the necessary funds for the repair of the only floating museum in Bulgaria –

the National Museum Steamship Radetzky, and financially supported the construction of the National Cyclotron Centre.

The co-operation with local authorities is another important priority of communication activities. Traditionally, Kozloduy NPP maintains relations of partnership with Kozloduy Municipality in organizing holiday or charitable events. In June 2012, the plant donated books to the three secondary schools in Kozloduy, Municipal Children's Centre, House of Culture, and Community Centre libraries of Kozloduy and municipal villages of Harlets, Glozhene, and Butan. The Nuclear Power Plant proactively took part in the preparation of the Independence Day celebration, organization of the Christmas Market and Christmas decoration of Kozloduy; supported the Christmas Matinee for children with special educational needs, etc. In cooperation with Vratsa Municipality, the Forest Trail of Health was built in "Vrachanski Balkan" Nature Park. As recognition of the successful joint work with the local authorities, on 24 October 2012 Kozloduy NPP won the Partner of Municipalities Prize, annually awarded by the National Association of Municipalities in the Republic of Bulgaria.





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