



# KOZLODUY NPP REVIEW

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Executive Director Ivan Genov (right) expressed his concerns regarding security of electricity supply in the Balkans

## Head of EC Representation Michael Humphreys visits Kozloduy NPP

Mr Michael Humphreys, Head of Representation of the European Commission in Bulgaria, visited Kozloduy NPP on April 26, 2007. He was accompanied by the Executive Secretary of Bulatom Mr Stanislav Georgiev.

The guests had a walk-down at Units 2, 3 and 5. After that, they met with the Kozloduy NPP's management as well as representatives of operational personnel from the closed 440 MW Units. Kozloduy's Mayor Milko Torbov attended the meeting as well.

Kozloduy NPP's Executive Director Ivan Genov reminded the guests all the positive conclusions of international safety reviews in recent years: by the International Atomic Energy Agency, the World Association of Nuclear Operators,

and the Atomic Questions Group to the European Council. Mr Genov emphasized the negative consequences of the early closure of Units 3 and 4 and said these reactors generated clean energy. "I don't understand the logic of shutting down safe nuclear units," said Mr Genov. In his opinion, this results in a higher loading of fossil fuel fired plants and releasing more harmful gases in the atmosphere. Therefore, this becomes an international problem and not just a problem of Bulgaria, added Mr Genov.

Mr Stanislav Georgiev said that Bulgaria strictly abides by its commitments under the EU Accession Treaty and Kozloduy NPP carries out all the planned activities regarding preparation for decommissioning. This is done regardless

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## Accents



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### Head of EC Representation Michael Humphreys visits Kozloduy NPP

of the losses Bulgaria faces from early closure of nuclear units. However, Bulgaria will continue to pursue re-starting of Units 3 and 4, said Georgiev.

At the meeting with the Kozloduy NPP management Mr Humphreys said: "I've been enormously impressed by what I've seen. Coming here today I've seen a power plant which, to my mind, is excellent. It appears highly professional, very well operated to the highest standards. I believe that the staff of the Kozloduy Nuclear Power Plant represents part of the cream of Bulgaria in terms of professionalism, in terms of intellect, in terms of background. I respect that enormously." He added that Units 3 and 4 were closed because it was a commitment Bulgaria has made in the course of its accession negotiations. "I respect the fact that Bulgaria has met its commitment which was not easy to meet but it has been met and it has been implemented," said Mr Humphreys.

### Czech delegation at Kozloduy NPP

Mr Martin Klepetko, Ambassador of the Czech Republic to Bulgaria, visited Kozloduy NPP on March 6, 2007. He was accompanied by Mr Juraj Melioris, Head of Commercial Section, Mr Miroslav Fiala, General Manager of Skoda JS, and Mr Jiri Demis, Member of the Board of Directors of Skoda JS.

The guests first visited the Information Center of Kozloduy NPP where they had a meeting with the nuclear plant management. The visitors were familiarized with the business development of the company and learnt about the achievements Kozloduy NPP has in safe operation. Mr Klepetko said the visit was a good evidence



Mr Martin Klepetko in a reactor control room

of the valuable cooperation between Bulgaria and the Czech Republic in the sphere of nuclear industry.

Following the meeting, the guests had a walk-down to several Kozloduy NPP Units.

## WIN backs up Kozloduy NPP in declaration



The authoritative international organization Women in Nuclear backed up Kozloduy NPP in a special declaration. The document was issued at the 15<sup>th</sup> Global Annual Meeting of the organization. The forum took place in Bali from April 23 to 27. Sixty-four women from twenty countries took part in the event. Bulgaria was represented by Ms Radka Ivanova and Ms Anna Petrova from Kozloduy NPP. They made clear to the other WIN members the serious situation in the Balkans following the early closure of Units 3 and 4. Kozloduy NPP received large support by all the participants. The declaration reads:

We, Women, employed in Nuclear industry, having acquainted ourselves with the information submitted by WIN-Bulgaria on the Kozloduy NPP Units 3&4 technical status, the ecological and economic consequences resulting from their decommissioning,

### **We decisively insist on the re-opening of Kozloduy NPP Units 3&4**

The grounds for this stand of ours contain solid facts, presented and openly discussed during the conference held.

Units 3 and 4 have been modernized and they meet the contemporary safety requirements. The safety enhancement program has been implemented by specialists from Germany, France, Russia, Spain, Great Britain, Italy and Austria. The results from the implemented design modernization and the operational safety of Units 3 and 4 are put into compliance with most up to date requirements of the operating power plants world wide. This has been firmly acknowledged by 25 expert missions and the following international organizations - IAEA, WANO, WENRA, EC-AQG/WPNS. The safety of these units is beyond any doubt for the Western

European organizations, including the recent inspection from a team of specialists of the European Commission (EC).

For this reason we consider the stability, reliability and safety of Kozloduy NPP Units 3&4 is unconditionally worldwide proven.

To the list of harmful economic consequences from KNPP Units 3&4 decommissioning we must add the social outcomes and ecological issues, which emerge as a result of the early decommissioning of these units.

The attempt to compensate power deficiency by means of extra power generation from thermal power plants will cause problems due to increase of emissions of harmful substances in the atmosphere, such as CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub> and dust.

The environmental pollution will make it impossible to achieve the aim of reducing emissions of "greenhouse" gases in the atmosphere, which contradicts the strategic line of the United Nations for avoiding catastrophic climate changes.

The defense of Kozloduy NPP Units 3&4 turns into a national cause for Bulgaria.

Following all reasonable arguments we are convinced that the decision for early decommissioning of KNPP Units is a big mistake, with enormous harmful economic, social and ecologic consequences.

### **We, WIN members,**

In our capacity of proven professionals employed in the nuclear field, being also women and mothers that are responsible for the future of our planet and our children, do believe that our voice will be loud enough and our message - convincing enough, so as to be heard from everybody, and most of all - from the politicians! Only in this way tomorrow we will not regret the decisions that are taken today!



## Knowledge

# Knowledge preservation guarantees safe operation

In a modern world, the 'economy of knowledge' has become a factor for the efficiency and success of each organization. At Kozloduy NPP, the necessity of systematic knowledge preservation has been determined long ago. As a result of the practical experience in the course of service of several generations of specialists, for 115 reactor-years, an enormous amount of knowledge has been generated for reactors VVER-440 and VVER-1000.



Operators get trained at the Full Scope Simulator

### Formal and non-formal knowledge

Knowledge is collected and stored in the Training Center's archive in various forms: courses, tests, video films, etc. These provide a serious scientific and practical basis for review of the VVER technology. In fact, these materials are in a way 'a file' describing the development of VVER technology and its implementation in Bulgaria.

It is important to preserve knowledge about operation, maintenance and upgrades. This also includes safety appraisals as well as various analyses of operation. Many of these documents resulted from the participation of Kozloduy NPP in various projects of the International Atomic Energy Agency (IAEA), the European Commission and many bilateral agreements. These are reports, collective and personal publications of KNPP specialists regarding numerous aspects of our plant's activities.

Operational experience is also 'knowl-

edge' and 'know-how': it's presented in the form of reports and analyses of events, engineering projects, design modifications, etc.

The personal experience of each KNPP employee, 'the implicit knowledge,' is also part of the general knowledge in the sphere of Bulgaria's nuclear industry. This is determined by each employee's position and length of service.

This knowledge exists now. Moreover, it has reached its highest point as many nuclear specialists conclude their careers at this moment. They had come to Kozloduy 30 years ago for the commissioning of the first VVER units. Kozloduy NPP has been an employer of choice and changing jobs was not very common as compared to other industries. Many experts possess significant amount of skills and expertise which need to be preserved.

## Knowledge preservation guarantees safe operation



The Central Archive stacks

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### Training

The structure of training is based on all the educational standards in the nuclear industry. In the course of decades, there have been constant efforts to create adequate training tools for nuclear specialists. Requirements are clearly defined for establishing special training organization. Sufficient time is needed before you reach a fully functional level of personnel training, says Liubomir Pironkov, Head of Training Center. This is the road Kozloduy NPP has traveled and its Training Center obtained both national and international recognition – through a national license and through the IAEA assessments.

Kozloduy NPP fulfils all the criteria for such activities: providing a training process with qualified instructors, applying a standard methodology and systematic approach, developing textbooks, teaching aids, etc.

Instructors play a crucial role in the process. They need to have specific educational skills but also a sufficient length of service. High quality education is provided through various means: computers, workshops, simulators, laboratories, etc.

Preparation of specialists for new nuclear facilities

Having in mind the construction of the Belene NPP, preparation of personnel becomes crucial even at the early stages of the project. The future operator of the plant should make the optimal choice based on normative documents and good international practice. The Bulgarian nuclear legislation outlines the major requirements as regards training of staff for a nuclear facility. The documents of the IAEA give more specific recommendations as to what positions require special training during construction, commissioning and operation of a plant. There are also national standards, Russian and American, which are commonly applied and could be used for planning of positions in advance, before construction, start-up and commercial operation. Human resources, nuclear know-how and material infrastructure are mainly concentrated in Kozloduy and Sofia. Worldwide practice shows that various approaches could be applied but there's a common trait: a need of a centralized educational center in countries operating more than one plant.

Therefore, in order to ensure efficient training of a good quality, it is appropriate to develop the existing resources in just one center for both Kozloduy and Belene plants. This would guarantee that existing experience would be utilized to the fullest extent.

## Focus

### Investment Program for 2007

The Kozloduy NPP's mission is to operate as a reliable, efficient and competitive supplier of electric power. This determines the priorities in the process of preparation of the Investment Program for 2007. Financing is provided by Kozloduy NPP's own funds. These resources are well-grounded and are planned according to investment projects of various departments.

The expenditures under the Program are structured in several major directions: construction activities, machines and equipment, engineering, surveys, intangible assets, etc. Investment expenses are also structured with regard to separate Units, including Modernization Program, Spent Fuel Storage, Switch Yard, Bank Pumping Station, Training Center, other plant facilities, as well as financing of measures for nuclear security improvements. Many of these projects started in 2006 and are still

ongoing.

70 percent of all expenditures go for Units 5 and 6 projects. The goal is to assure compliance with all the safety requirements. The major projects regarding Units 5 and 6 envisage development of new technologies and technological specifications for safe operation in line with international standards and the operational licenses. Another major project is the implementation of a system for permanent control of the primary circuit's water chemistry. Also, the specialists envisage financing for reconstruction and modernization of the polar crane in the reactor building.

The Investments Department has also allocated funds for modernization of the Kozloduy NPP's computer network. At the beginning of 2007, a special lab was constructed for radiation flaw detection. Furthermore, the Program envisages financing of several other projects such as replacement of pipes of the Kozloduy's central heating system as well as refurbishing of a Kozloduy NPP's hostel.

### Seminar on nuclear security

Identification of vital areas for nuclear security was the theme of a seminar hosted by Kozloduy NPP on April 16-19, 2007. The seminar was initiated by the International Atomic Energy Agency (IAEA) in cooperation with the Nuclear Regulatory Agency (NRA) of Bulgaria.

Specialists from the NRA, RAW State Enterprise, the Institute for Nuclear Research and Nuclear Energy, Risk Engineering and other companies took part in the seminar. Kozloduy NPP was represented by Mr Tsviatko Tsvetkov, head of Security Department, and other experts on nuclear security. Also, a group from the Armenian plant Metsamor and specialists from Armenia's nuclear regulatory body attended the seminar.

IAEA's representative Arvydas Stadalnikas said this was the first seminar in a series of similar forums which would be organized in various countries by the IAEA. The Bulgarian seminar was under the Nuclear Safety Program 2006-2009. The IAEA provides assistance to member countries as regards physical security of nuclear facilities used for peaceful purposes. The agency has been particularly active in this sphere in recent years. The IAEA spends under the Program about USD 15 million each year to assure adequate measures against nuclear and radiological threats.

The lectures and the exercises during the seminar were prepared by Mr Bruce Vardano and Mr Craig Tewell by Sandia National Labs, USA. Mr Vardano said the goal of the training was to provide means for identification of vital areas in nuclear plants which must be effectively protected against terrorist attacks.



## Kozloduy NPP specialists take part in missions worldwide



Mr Georgi Valchev (2nd on the right), Senior Expert on Radiation Protection, during the WANO peer review at Monju NPP, Japan

Kozloduy NPP experts participate actively in international forums to exchange experience and knowledge in the sphere of nuclear industry. In 2006, our specialists took part in 67 events - conferences, peer

reviews, congresses, etc. The world nuclear community gave a high appraisal of the Kozloduy NPP professionals by inviting them to join IAEA missions as well as peer reviews of the World Association of Nuclear Operators (WANO). In the last year, specialists from Kozloduy were included in a technical support team in Finland, as well as a mission at Bushehr NPP (Iran). Moreover, our experts took part in peer reviews at Monju NPP (Japan), Kola NPP (Russia), technical support team in Ukraine, and a pre-peer review at Tianwan NPP (China).

Kozloduy NPP specialists were invited to symposia, conferences and congresses in Slovakia, Great Britain, Russia, Austria, Spain, Germany, Netherlands, Slovenia, etc.

## Sophisticated technology calls for well-trained specialists

The sophisticated technology for nuclear generation of electricity and the specificity of management at one of the major Bulgarian companies require motivated and well-trained personnel. The educational structure at KNPP shows that 26% of personnel have a Master's degree, and 9% have another university degree. 47 percent have graduated from vocational schools, most of them coming from the Igor Kurchatov Professional School of Nuclear Energy. Moreover, Kozloduy NPP has specialists who graduated from the

Moscow Institute of Energy, the Polytechnics of Kiev, Odessa, Saint Petersburg, Harkov, and from most of Bulgaria's universities. More than 2,000 university majors are represented at Kozloduy NPP. These are mainly engineering profiles but also economics, IT degrees, psychology, medicine, etc. Kozloduy NPP is a place where a vast spectrum of theories could be proven in practice: in the sphere of nuclear physics, chemistry, physical metallurgy, electrical engineering, etc. The plant has a Center for Flaw Detection and Non-destructive Control which has received international recognition. Kozloduy NPP's Metrology Department is among the leading departments in the country.

## Partnership



### UK Department of Trade and Industry organizes a conference in Ukraine

On April 16-19, 2007 in Slavutich (Ukraine) was held the third international conference entitled "Social and Economic Stabilization of Regions Impacted by Decommissioning." Mr Borilsav Borisov, Chairman of the Municipality Council, headed the Kozloduy delegation. The other Bulgarian participants were from the Municipality of Kozloduy, the Kozloduy Business Center and the Kozloduy Regional Economic Development Initiative. Kozloduy NPP was represented by Ms Petia Mitrikova, acting head of Human Resources Department, and Mr Nedialko Mishovski, Program Assurance Senior Expert. They presented the activities of Kozloduy NPP finances by the UK Department of Trade and Industry, and made a special presentation on the management of social consequences in the process of decommissioning.

The UK Department of Trade and Industry financed the conference under the Social and Economic Consequences of Nuclear Power Plant Closure Program. During the forum, the participants made conclusions regarding the program implementation in the course of five years.

Significant help was given to the regions of Ignalina (Lithuania), Slavutich (Ukraine) and Kozloduy (Bulgaria). The program was established in order to ensure assistance to several countries with specific orientation to the local communities' needs. The major benefit for these communities was the fact that they were provided alternative employment opportunities. Moreover, opportunities were presented for change of professions and new professional qualification bearing in mind specific demands of the labor market, business development, private enterprise, and the potential for economic growth within these communities.

During the conference, information was provided regarding implementation of projects as well as information for innovative approaches in solving issues arising from closure of nuclear facilities. Experts from areas with ongoing decommissioning programs shared experiences and discussed possibilities for governmental and municipality help. Delegations from Lithuania, Ukraine and Great Britain took part in the conference.

#### KOZLODUY NPP REVIEW

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