



# ISOE NEWS

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for ISOE Members

## **ISOE News No.2, March 2004**

Prepared by ISOE Asian, European, North American and IAEA Technical Centres (TC)

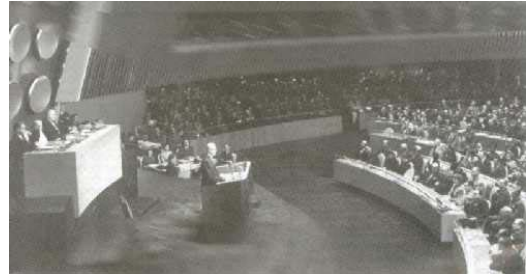
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### **IAEA Director General: Mohamed ElBaradei:**

“This year marks the 50<sup>th</sup> anniversary of the »Atoms for Peace« speech by US President Eisenhower, in which he articulated a vision, shared by many world leaders, that would enable humanity to make full use of the benefit of nuclear energy while minimizing its risk. It was this vision that led to the establishment of the Agency. Much has changed since that time, and I believe it is appropriate for us to take stock of our successes and failures – and to resolve to take whatever actions are required, including new ways of thinking and unconventional approaches, to ensure that nuclear energy remains a source of hope and prosperity for humanity, not a tool for self- destruction.”

*IAEA-BULLETIN, December 2003, [www.iaea.org](http://www.iaea.org)*

### **Historic Initiative – Global Vision**



**Address by US President D. Eisenhower** to the UN General Assembly, 8. Dec.1953, called for both international control and promotion of atomic energy “to serve the peaceful pursuits of mankind”.



### **User Friendly Software on NPPs Data**

For those who would like to receive general information about nuclear power plants around the World, have a look at the following web address:

[www.icjt.org/an/index.htm](http://www.icjt.org/an/index.htm) - and you will find under title “The World of Nuclear Power Plants” information software to be down-loaded, or under “Nuclear Tech” - “NPP in the World” - an on-line “Nuclear Data Base System”.

### **ISOE New Release of Database**

The new release of the ISOEDAT database (version 4.2 revision 62) is now available on CD. This new version includes the MADRAS module with new analysis features. The database can also be downloaded by interested utilities. Utilities may ask Lucie d’Ascenzo for the address and password ([dascenzo@cep.asso.fr](mailto:dascenzo@cep.asso.fr)).

## 8<sup>th</sup> Regional IAEA Workshop of Health Physics Groups, Kozloduy, Bulgaria, 21-24 October 2003

The 8<sup>th</sup> Workshop, organized under the IAEA's Technical Co-operation Programme, was kindly hosted by the Kozloduy Nuclear Power Plant. It was attended by 22 representatives, supported by the IAEA, from utilities and NPPs of the WWER, RBMK and CANDU type in Armenia, Czech Republic, Hungary, Lithuania, Romania, Russian Federation, Slovakia and Ukraine. In addition, four representatives from Kozloduy NPP, and a representative for Loviisa NPP (WWER) in Finland took part.

The Agenda for the Workshop contained plant or country reports by all participants, reports and discussions on comparisons of dose rate measurements for WWER and RBMK type reactors, and presentations on specific topics, such as control of contamination within the controlled area, "hot spot" handling at Paks NPP, electronic radiation work permits, evaluation of worker exposures at Dukovany NPP and Kozloduy NPP, the tank cleaning incident at Paks NPP and the radionuclide content in the primary circuit water and on-line detection of noble gases from fuel assemblies in Temelin NPP.



Kozloduy Site



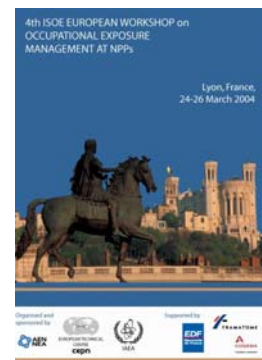
Workshop Participants – RP Managers and Professionals

The Kozloduy NPP was visited during the third day of the Workshop. The IAEA Draft Safety Report on Radiation Protection of Itinerant Workers was presented and later distributed for comments to interested participants. In addition, the IAEA Working Materials on ALARA training and on Self-assessment were presented and discussed. The participants were informed about the plans to complete the project by the end of 2004, and also about the possibility to integrate some of the current activities into a future project on ALARA implementation in general.

All presentations made were provided on a CD-ROM at the end of the Workshop. The next Workshop is planned for 2004 in Ukraine or Romania. The contact person at the IAEA regarding these workshops is Monica Gustafsson.

## 4<sup>th</sup> European ISOE Workshop and Related Meetings in March

The next ISOE workshop (IAEA/ETC) will be held in Lyon, France, 24<sup>th</sup>-26<sup>th</sup> of March, 2004. As a new service within the ISOE System, a one day meeting will be organised for European regulatory body senior representatives on 23<sup>rd</sup> of March. It will be hosted by the French Regulatory Body (DGSNR). On the same day there will be a meeting for the ISOE National Coordinators from Utilities, hosted by French Utility EDF.



## North American ALARA Symposium

The 2004 North American ISOE ALARA Symposium was held at the Hyatt Regency Hotel in Coral Gables, Florida from 11<sup>th</sup> through 14<sup>th</sup> of January . There were 85 nuclear industry professionals from 10 countries. Richard Warnock, NATC Board Chairman and Project Manager, San Onofre NGS provided the welcoming message. Together 25 technical papers were presented. NATC is providing a compact disc containing the presentations.

### NEI Chief Health Physicist Receives Highest Award



Ralph Andersen (*on the left*), chief health physicist for Nuclear Energy Institute, has been named the 2003 Radiation Protection Professional of the Year by the North American Technical Centre of the ISOE. Andersen was chosen for the annual award by a group of his peers – about 130 radiation protection managers at U.S. nuclear power plant – for his outstanding leadership in radiation safety. The organization presented the award Jan.12 during its 2004 North American ISOE ALARA Symposium.

*Overview, Weekly Report of Nuclear Energy Institute*

## Creating the Future for Radiation Safety at NPPs in the U.S.

*This article is based on R. Andersen's presentation at NATC ISOE Symposium 2004*

### Nuclear Power - Past, Present and the Future

Until Atoms for Peace Initiative, nuclear option was a US monopoly. President Eisenhower gave the signal to start construction at Shippingsport, 1954. Prior to TMI, it was predicted that we would have 400 nuclear plants operating by 2000. TMI caused to redesign and rebuild existing plants. Some 110 plants were licensed or re-licensed and many new planned were cancelled.

Deregulation in 1990's influenced the production in a way of streamlining, efficiency and optimization. During this period an increase in nuclear plants output was equivalent to 26 new 1000 MWe units. Now, the production costs are in favour for Nuclear 1.71 cents per kWh, compared to Coal 1.85 cents, Gas 4.06 cents, or Oil 4.41 cents. Nuclear is slightly more cost effective than Coal. This was not the case between 1987 and 1999.

Environmental issues are paramount. Comparison of emission free generation options shows that the share of nuclear option is 76 %, hydro power contributes 22 % and all the other less than 3 %. Trend for those who favour /oppose new nuclear energy is: 60 % favour / 36 % oppose. Reliability is also a key factor but harder for public to comprehend.

January 2004 update about plant applications for licence renewal gives the following: 13 extension granted in 2003, 12 extension filed for approval, 13 more in 2004, 2 in 2005, 4 in 2006. Nuclear capacity additions at existing facilities (2000-2007) are due to power up-rates and capacity factor improvements.

There is a vision for 2020 that new 50 tera watts nuclear units will be added to the grid. In all likelihood, new plants will be co-located with existing plants. For example 3 sites are in consideration by Dominion, Exelon and Entergy. Another 10 tera watts capacity in 2020 will be added through increased performance and efficiency at 103 NPPs. This is the most achievable part of the vision. Government is considering tax reduction for nuclear plants due to low nuclear emissions.

## What about Radiological Protection (RP)?

Our decade-long performance has been outstanding, except for the recent events: 5 consequential radiological events and 75 radiation protection events since January 2002, multiple near-misses, and several hundreds intakes from more than dozen events, and some inadvertent releases of radioactive material. Common causes: lack of anticipation and/or recognition the significance of radiological conditions; insufficient oversight of radiological significant work; use of technology without fully recognised implications.

Industry actions to stop the adverse trends in RP events were conducted by NEI and INPO. Immediate actions were addressed in fall 2003 outages and there was an increased awareness. Step-change improvements were noticed with positive feedback from RP managers on action plans and barrier analysis. The result is reduction of RP events and no further RP events in the fall outages.

Next actions in 2004 will provide experience/feedback to plants for spring outages and will determine process for developing a strategic plan and vision to create a framework for integration and co-ordination with all industry RP organizations.

## The future challenges of RP

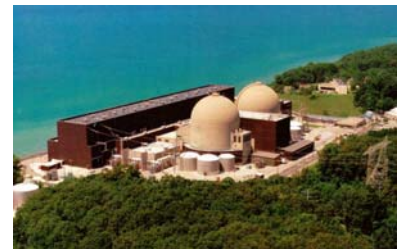
Competitive market development will have additional impact on efficiency and production. Other »urgent« issues such as shorter duration, less frequent outages and increased work scope will demand management attention which may decrease focusing on RP.

The common issues may arise such as degraded fuel performance, source term transients, less experienced workforce, reduced RP staff. We are going to see more ageing materials issues. The fuel is stretching to its performance limits.

Staffing of industry RP is one of the most exposed challenges to be addressed. The public interests and concerns related also to radiological issues will continue. RP professionals and managers should be able to find answers to radiation safety concerns in the future.

## NATC 2003 World Class ALARA Performance Award

The Donald C. Cook Nuclear Plant located in Bridgman, Michigan, was awarded the 2003 World Class ALARA Performance Prize by the North American Technical Centre, Information System on Occupational Exposure, College of Engineering, University of Illinois. The Cook Nuclear Plant employees and contractors were recognized for exceptional achievement in the area of occupational dose reduction in 2003. Significant occupational dose reduction was achieved in the fall, 2003 refuelling outage. The lowest outage dose in the plant's history was achieved (0.79 man-Sv). The previous lowest refuelling outage dose was 1.22 man-Sv.



The exceptional team effort among plant operations, outage management, chemistry, and radiation protection was noted in the citation for implementing innovative state-of-the-art technology to contribute to the remarkable reduction in refuelling dose. D.C. Cook was also recognized for significant plant improvements to reduce occupational dose by the installation of permanent work platforms at repetitive work locations and the installation of permanent shield walls.



## Temelin NPPs in Czech Republic

Temelin NPP site consists of two units **WWER** 1000 (type V320), each with a rated thermal power of 3 000 MW.

The original design was modernised in the early nineties. The instrumentation and reactor control system, the diagnostics as well as the complete radiation monitoring system is replaced. Currently, both units are in the stage of trial operation.

In unit one there was the first refuelling outage (85 days) in year 2003. The outage collective dose was 0.14 man-Sv and yearly dose was 0.2 man-Sv. These low dose results are due to:



- During design phase, the materials of the primary components were chosen very cautiously not to have any problem with activated corrosion products such as  $^{60}\text{Co}$  or  $^{110\text{m}}\text{Ag}$ . This is due to the fact that ALARA principles were properly taken into account during the modification of the original soviet design
- During operation phase, the ALARA principle was strictly implemented to the working procedures

The basic water chemistry of the primary coolant at Temelin NPP is ammonia; hydrazine is added to the primary circuit only during start-up of units after outages.

### ALARA organization

Implementation of the ALARA principle at Temelin NPP was managed by ALARA Commission consisting of the ALARA Committee (decision making group) and the ALARA Working group from the very beginning of the Plant commissioning.

ALARA Committee, which represents a part of the Temelin NPP Safety Commission, determines the strategy in the implementation of the ALARA principle and evaluates the present level of radiation protection.

### Utility organization

Since 2004, new organization structure of nuclear power plants within Czech Power Plants will take place. Both NPPs will be managed by new Nuclear Division. Within this frame also four Dukovany units will be included.

The purpose of these changes is centralization of organizational responsibilities and unification of the processes at the NPPs. The policy is to integrate the management and to compete on the energy market.

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