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Nobel Peace Prize Awarded to IAEA and Director General

"The Norwegian Nobel Committee has decided that the Nobel Peace Prize for 2005 is to be shared, in two equal parts, between the International Atomic Energy Agency (IAEA) and its Director General, **Dr. Mohamed ElBaradei**, for their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way," the announcement said.

Statement at WANO Meeting – "Nuclear Energy: 21st Century Promise"

(www.iaea.org)

Dr. ElBaradei was asked to speak at General Meeting of WANO on the topic »Nuclear Energy: 21st Century Promise«. Here below are some highlights from his speech (Budapest, October 2005).

The Global Energy Imbalance

Approximately 1.6 billion people — ***one in four*** of our fellow world citizens — lack access to modern energy services. As we look to the "promise" of the century that lies before us, "connecting the unconnected" will be a key measure of our success.

Growth In Demand

Three factors are driving an expectation of substantial growth in energy demand in the coming decades — namely: the drive to raise living standards in the developing world; continued population growth; and the never-ceasing expansion in consumer products and technologies that increase the quality of life but consume additional energy. So it should be no surprise that even the most conservative estimates predict at least a doubling of energy usage by mid-century.

The Emerging Expansion In Nuclear Energy Use

Nuclear reactors currently generate electricity for nearly 1 billion people, producing about 16% of the world's electricity. Fast growing global energy demands, an increased emphasis on the security of energy supply, and the risk of climate change are driving a renewed consideration, in many quarters, towards investment in nuclear power. Near term nuclear growth remains centred in Asia and Eastern Europe, which together account for 22 of the 24 units now under construction. The Russian Federation intends to double its nuclear generating capacity by 2020; China plans nearly a six-fold expansion in capacity by the same date; and India anticipates a ten-fold increase by 2022. Elsewhere, plans remain more modest, but it is clear that nuclear energy is regaining stature

as a serious option. When Finland began pouring concrete for Olkiluoto-3 earlier this year, it was the first new nuclear construction in Western Europe since 1991.

Increased Availability, Sustained Safety Performance, Improved Economics

Many analysts attribute this resurgence of interest in nuclear power to concerns regarding climate change and security of energy supply, as I just mentioned. But we should not underestimate the importance of another factor: namely, the improvements in global safety performance.

The accident at Chernobyl in 1986 prompted the creation of the World Association of Nuclear Operators, and revolutionized the IAEA approach to nuclear power plant safety. Both organizations created networks to conduct peer reviews, compare safety practices, and exchange operating information to improve safety performance. The IAEA updated its body of safety standards to reflect best industry practices, and put in place legally binding norms in the form of international safety conventions. And a more systematic analysis of risk has been used to ensure that changes made were in areas that would bring the greatest safety return.

Although the focus of these international efforts was on improving safety, a secondary benefit was the steady increase in nuclear plant availability and productivity — an increase also supported by improved management, liberalized electricity markets, better preventive maintenance practices and technological enhancements. In 1990, nuclear plants on average were available for generating electricity 71% of the time. As of 2004, that figure stood at 83% — an improvement in productivity equal to adding more than 30 new 1000 megawatt nuclear plants — at relatively minimal cost.

Managing Safety In A "Mature" Nuclear Industry

Addressing the "Weak Links"

First, I believe it is vital that we improve our performance in fixing the so-called "weak links" in the nuclear safety chain. Since the 1986 accident at Chernobyl, enormous efforts have been made in upgrading reactor safety features, but facilities still exist at which nuclear safety assistance should be made a priority. The symptoms at such facilities are readily evident: less than optimal design safety features; the lack of strong, independent regulatory oversight; and poorly coordinated, narrowly focused international safety assistance. For such facilities, the international nuclear safety community should move expeditiously, with coordination between WANO, the IAEA, and other relevant organizations, to clarify the actions needed, the expected costs, and a strategy and schedule for proceeding.

Aging Issues (Facilities)

A second challenge, natural to a maturing industry, relates to the aging of nuclear facilities. As licences are extended, and some major components are replaced, the type and frequency of equipment safety issues may begin to shift. In addition, older plants may not have all the safety features of modern designs. For these reasons, it is important that insights related to aging are thoroughly shared among operators and regulators.

Aging Issues (Workforce)

Aging of the nuclear workforce is also becoming a challenge in some countries. One aspect of this challenge is sometimes referred to as "maintaining the safety case" at operational reactors. The IAEA recently participated in a joint assistance mission with WANO at the Krško nuclear plant in Slovenia, focused on helping plant management to systematically capture undocumented information — such as the safety and technical insights of retiring workers. Building on a recommendation from that visit, we hope to develop policy guidance on this topic for nuclear power plants, with strategies and procedures based on best industry practices.

A second aspect of the aging workforce challenge is more straightforward: namely, developing the next generation of nuclear scientists and engineers. While some countries (such as China and India) are turning out science and engineering graduates at record rates, the same does not hold true for others. The creation of the World Nuclear University (WNU), as a global network of relevant industrial, educational and research institutions, has been a step in the right direction. However, this issue demands more engagement on all sides, in my view — particularly if the projected expansion of nuclear power is to occur.

Final part of Dr. ElBaradei statement (Managing the Nuclear Expansion) can be found at www.iaea .org/NewsCenter/Statements

IAEA General Conference 2005 – Scientific Forum

Proliferation, Waste Issues Shaping Nuclear Future

(www.iaea.org)

Nobel Laureate Burton Richter scrutinised the promise and problems of nuclear energy in a keynote address to the IAEA´s Scientific Forum 27 September 2005.

The 1976 Nobel Physics Prize winner said the full potential of nuclear power -- as a source of large scale carbon-free energy -- could only be realised if governments and the public were satisfied that radioactive waste could be safely disposed of and that the risk of proliferation of nuclear weapons was low.

Nuclear Weapons

Prof. Richter said the development of advanced technical safeguards had received little funding recently. He called for an internationally coordinated program for their development to be implemented. "Proliferation resistance and monitoring technology should be an essential part of the design of all new reactors, enrichment plants, reprocessing facilities and fuel fabrication sites," he said.

Nuclear Waste

Prof. Richter outlined two general ways to protect the public from highly radioactive spent fuel created by nuclear energy production. Isolate it from the biosphere for hundreds of thousands of years, or use destruction by neutron bombardment. The latter case -- which involves the reprocessing of spent fuel -- is done in France where up to 96 percent of the spent fuel´s content is recycled and used again as new fuel to power the reactor.

Isolation is the principle behind the "once through" system, where the waste is not recycled and turned into new fuel. This is advocated by the United States for reasons related to preventing weapons proliferation.
"To use the United States example, if nuclear energy were to remain at the projected 20% fraction of the US electricity needs through the end of the century, the spent fuel in a ´once through´ scenario would need nine repositories of the capacity of Yucca Mountain... This would be quite a challenge since we have not been able to open the first one."

"In the world of expanded use of nuclear power, the once-through cycle does not seem workable," Prof. Richter said. He added that once through was not that different from reprocessing, when it came to mitigating proliferation concerns.

ISOE Strategy for the Future

The ISOE Working Group on Strategic Planning (WGSP) has started work with the first meeting on the 19th and 20th of September in Paris. The group was launched following the direction of the Steering Group, and will provide suggestions to the Steering Group about strategic issues and options. These outcomes of the WGSP will address possible improvements to the ISOE activities and products, and its organisation.

The WGSP includes membership from utilities, authorities, technical centres and the ISOE Secretariat. Discussions at the first meeting were held in an open and honest atmosphere with the goal to find future options for enhancing the ISOE programme and meeting end user needs.

The ISOE web portal and web-enabled database is one of the options already defined, and will be presented at the Steering Group meeting in November 2005. The suggested strategy is to make all ISOE products available through a single portal, providing a "one-stop shop" from which users can:

- obtain the latest ISOE dose data, trends and analyses;
- search the most complete ALARA-approach database in the nuclear industry;
- directly exchange experience through a question-and-answer archive system; and
- connect to the other related information, including links to every significant, available radiation protection web-site.

A key element of this work will be collecting and making available the current and future ALARA and RP experiences of the ISOE community through the web-site. Since there is a lot of information available within ISOE and all of the nuclear industry, a new interactive interface allowing users to quickly find and access available information has been proposed. The Asian Technical Centre has offered to help develop a digital web package for information storage and searching.

The WGSP has also identified the need to better define the work of the Technical Centres (TCs), which are important for day-to-day operation of ISOE, and to better match the ISOE products to the RP needs of the end user. The working group also proposed to develop a unified address book of RP managers at individual NPPs to improve access, enable communication and information exchange, and access to ISOE products.

Organisational issues are also important and will be considered before the next revision of ISOE Terms and Conditions, scheduled for 2007. Among the suggestions is a review of the programme management structure, and the roles of the various participants. One of the first issues identified in this regard is the need to strengthen the day-to-day operation of the TCs and the outputs of the Working Group on Data Analysis (WGDA).

It was noted that the unique value of ISOE is based on the combination of its important occupational dose data, dose reduction experience, analyses, information exchange and the ability to bring utilities and regulators together in a common forum. ISOE is strong in the organisation of international workshops, in releasing country reports and news, and supporting specific user groups. It is expected that the outcomes of the WGSP will move the ISOE programme towards becoming the information source and communications network for the radiation protection community when topics of occupational radiation protection are discussed.

Lithuania Update

Gintautas Klevinskas and Gintautas Balcytis, RP Centre, Lithuania, www.rsc.lt

Nuclear Power

Lithuania operates Ignalina NPP (INPP), which contains two Units of RBMK-1500 reactors (actual thermal power output – 4200 MW, electrical power capacity – 1500 MW). The first Unit of INPP went into operation at the end of 1983, the second Unit in August 1987.

The Ignalina NPP produces approximately 80 % of the whole electricity consumed in Lithuania.

Dosimetric Trends

In 2004 there were about 4400 workers, to whom the individual doses were assessed and 34 % of them were outside workers, visitors and guests.

The collective dose at the INPP has reducing trends: 4.40 manSv/unit in 2002, 4.27 manSv/unit in 2003 and 3.41 manSv per unit in 2004. Outside workers receive up to 50% of the collective dose.

In 2004 the average effective individual dose for INPP staff was 1.53 mSv, for outside workers it was 3.53 mSv. The maximum individual effective dose for INPP staff was 19.2 mSv, and for outside workers – 29.4 mSv. The individual doses of 43 outside workers exceeded 20 mSv, but their average individual doses in 5-year rolling average (2000-2004) did not exceed 20 mSv.

Exposure reduction measures in 2004

In 2004 the measures foreseen in the Plan of Implementation of the Decommissioning Programme for the Unit 1 and in ALARA programme for 2004 at the INPP were further implemented. The main and most effective ALARA programme measures implemented in 2004 during outages of Units 1 and 2 were as follows:
- flushing of the Main Circulation Circuit, collector of ECCS and pipes in hermetic rooms
- installation of protective lead shields during outage works
- optimization of work schedule during the outage at Unit 2.

Modernization of radiation control system

The automatic system (AKRB-06) for control of assurance of radiation protection of workers and environment is in operation at the INPP. System is installed in the territory of INPP and in the monitoring area of potential radioactive contamination. AKRB-06 is able to register following parameters: radioactive discharges into environment, gamma radiation and air contamination in the INPP rooms, contamination of technological environment etc. The radiological indicators reflect radiological situation at the INPP and in the environment. Modernization of AKRB-06 began in 2004 and it will be finished in 2006.

More information can be provided from the INPP ISOE contact Mr. Viktor Pletniov (pletnev@mail.iae.lt).

Decommissioning Plans of Ingalina NPP

After Government decision, Unit 1 of INPP was shut down on 31 December 2004. The Unit 2 is planned to shut down at the end of 2009.

Due to unique design and large scale and complexity of the plant, the decommissioning of the INPP is a real challenge both for the operator and regulatory authorities. The preparation for decommissioning of the INPP already started in 1999.

There will be of particular importance to ensure that decommissioning works will be implemented in such a way that will allow to ensure the minimal radiological impact to the workers, general public and environment. Therefore, a good planning in this field is essential and it serves as a prerequisite for smooth decontamination and dismantling works, when they actually will start.

Implementation of exposure optimization measures will not lose their importance during decommissioning and dismantling activities. This issue will become even more significant. Generally, the measures are already reflected in decommissioning planning documents - Ignalina NPP Final Decommissioning Plan. Detailed work procedures and planned exposures will be provided in separate decommissioning and dismantling projects (developed for particular decommissioning phases) and associated safety analysis reports.

Regulatory authorities now review one of the initial decommissioning phases, the D&D Project for Reactor Final Shutdown and Defuelling Phase (DP1).

The collective dose estimates are provided in the DP1 and they will be as follows: 15.93 manSv for the overall collective dose, of which 9.93 manSv for Unit 1 exclusively post-shutdown and defuelling activities, and 6.0 manSv for Unit 1 non-exclusively related activities. The average annual individual dose is estimated to be 3.3 mSv.

News from Bruce Power, Canada

Chris Trahan, Manager - Health & Safety, Bruce Power

Bruce Power announced that it has reached a definitive agreement with the Ontario Power Authority and will now launch a $4.25 billion Canadian dollars investment program to secure the long-term future of its site, beginning with the restart of Bruce A Units 1 and 2.

Bruce Power is Ontario's largest independent generator of electricity. The Bruce Site includes 8 CANDU Reactor Units. Units 1 and 2 were first brought into service in 1977 by the former Ontario Hydro. Unit 2 was laid up in 1995 and Unit 1 in 1997, when Ontario Hydro opted to temporarily lay up some units to concentrate its resources on other reactors in its nuclear fleet.

Bruce Power has entered into a lease agreement with Ontario Power Generation in 2001 to operate the Bruce nuclear generating stations.

Under terms of this long-term agreement, Bruce Power will restart Units 1 and 2 so they can operate for an additional 25 years. When needed, Unit 3 will undergo a similar refurbishment with new steam generators and fuel channels, while Unit 4's steam generators will be replaced as required. Total output will be more than 6200 MW.

The combined effect of these projects means Bruce Power will continue to generate clean electricity for Ontario until 2035 and beyond instead of closing its final unit in 2018 as previously planned.

Work to restart Units 1 and 2 will begin immediately upon closing with the first unit expected to be online in 2009, subject to approval by the Canadian Nuclear Safety Commission (CNSC). An Environmental Assessment for an expanded Bruce A restart is currently underway and a final report is expected to be submitted to the CNSC later this year.

Before Units 1 and 2 return to service, all major life cycle items such as fuel channels and steam generators will be replaced. In addition, all ancillary systems will be upgraded to modern codes and standards. The company anticipates the project work force, which will be primarily hired through local union halls, to peak at more than 1500 full-time workers during the approximately four-year construction period.

Education and Training in RP

3rd International Conference on Education and Training in Radiological Protection (ETRAP2005) will be held on November 23-25, 2005 at Hotel Metropole in Brussels, Belgium. It is intention to put forward a declaration on harmonisation of education and training on a European level. Keynote session is foreseen for EU institution view and policy.

Conference sessions will cover topics such as training & education needs in the medical and industrial sector, policy issues (certification/accreditation/recognition), training tools, quality assurance. Organisers are The Belgian Nuclear Research Centre and Federal Agency for Nuclear Control. More information are available at www.etrap.net.

2006 North American ISOE ALARA Symposium
EPRI Radiation Protection Conference

2006 North American ISOE ALARA Symposium will be held on January 16-18, 2006 at the Hilton Disney Resort in Orlando, Florida USA with the theme:" ISOE Achievements in Occupational Dose Reduction at Nuclear Power Plants." The invited guests on the Monday morning plenary session are Bruce Power President and CEO, Distinguished IAEA Representative, USNRC Commissioner and Finnish Plant Manager.

Key topics to be discussed include future dose impacts of plant material inspections, 23% reduction in US PWR doses in 2004, Japanese BWR dose reduction national initiative, new INPO dose goals for 2010, dose results of first pressurizer replacement at St. Lucie, annual station dose goals establishment and 5 year ALARA Plans. See the website for registration information: www.natcisoe.org.

Prof. Herman Cember, author of Health Physics textbook, and other speakers will be conducting professional health physics continuing education courses on Sunday, January 15, 2006. Preliminary topics include air sampling, ICRP lung model, BEIR VII and skin dose calculations (VARSKIN).