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ISOE NEWS

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for ISOE Members

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Announcement of 2005 ISOE/EPRI ALARA Symposium

International ISOE/EPRI ALARA Symposium will take place in Miami, U.S.A., January 9 to 12, 2005. It is sponsored by OECD NEA/IAEA and EPRI. The 2005 symposium is held in conjunction with other industry meetings related to radiation protection. A special session is organized about radiological work management practices that have achieved shorter refueling outages and occupational dose reduction. Effective methods of planning, scheduling, training and managing refueling and services outages will be presented.

The ISOE/EPRI ALARA Symposium is an excellent forum for Radiation Protection Managers, ALARA engineers, outage planners and regulatory health physicists. Plans include participation from over 10 countries and over 30 vendors. Technical papers and panel discussion will present experience with: Current Risk Informed Regulatory Inspections; PWR Reactor Head Inspections, Repair & Replacement; ICRP Recommendations; CANDU ALARA Group Initiatives; and Dose Reduction Programs. The Symposium will be at the Ft. Lauderdale Westin Hotel.

National Registry of Radiation Protection Technologists (NRRPT, USA) will provide three courses for enrichment of professional knowledge: A straight-Forward Approach to Radioactive Material Shipping; Laboratory Quality Requirements for NRC Licensees; Basic Whole Body Counting and Internal Dosimetry for Health Physics Technician. Electronic Symposium Registration: NATCISOE.org.

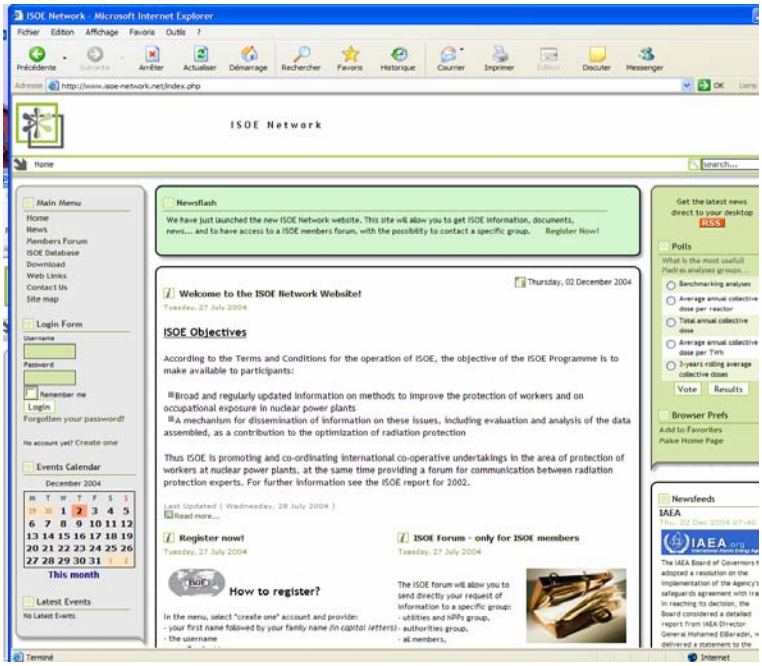
ISOE Steering Group (SG) Meeting, 17-18 November

2004 ISOE SG meeting took place at NEA Headquarters. At the meeting a new web supported ISOE data exchange system was presented by European TC. Country Reports were presented by Steering Group members and special topical session was dedicated to Control of Occupation Exposure, Inspection Organisation and Practices, Dose Constraints and Event Reporting. SG proposed to identify and assess areas of improvements of ISOE and key “products” that are needed and that are being or could be provided. This work will be accomplished by ad-hoc Group on Strategic Planning during the year 2005 and presented to the SG for consideration in 2006.

The chairman of the SG for the next two years is Jean-Yves Gagnon, of the Gentilly-2 NPP, Canada. The new chairman-elect is Wataru Mizumachi, JNES, Japan. Past-chair is now Carl Goran Lindvall, and Borut Breznik was confirmed as editor of ISOE News.

The ISOE Network

A new web-site is available for the public and for the ISOE members at the following address: http://www.isoe-network.net/. There are two types of registration: general registration allows access to documents; a second registration is needed for the ISOE discussion forum. Do not forget to register to the on-line ISOE discussion Forum by clicking on "Members Forum" and on "Register" at the top of the screen.



The forum for discussions will facilitate requests of information to all ISOE participants or to a specific group (all the utilities or all the authorities).

ISOE members are invited to register, providing a password. Please note that ISOE participants can only be officially registered by the moderator only after checking membership with the corresponding national co-ordinator. To initiate the ISOE forum, the national co-ordinators are invited to provide the European Technical Centre with a list of members.

The registered ISOE members may download documents such as the ISOE News or the presentations of the country reports during the Steering Group meeting. In the future, the updated ISOE Database will be on the web.

Germany 2004 News

Heinz Peter Kapteinat

Electronic Personal Dosimeters (EPD)

The discussion about the introduction of EPDs for the legal dose monitoring is still ongoing. In parallel to a very successful pilot project carried out by a German NPP in cooperation with a legal monitoring institute, the Federal Ministry of Environmental Protection as the regulatory authority has started an independent project to investigate the feasibility of such a system. This procedure, performed in an atmosphere which is influenced by an antinuclear policy, might create unnecessary delays.

Radioactive Release Controls

An unintended and uncontrolled release of radioactivity, far below the limits but on a non-licensed pathway in one of the KONVOI-Plants, has initiated comprehensive examinations of systems in order to make sure, that interfaces between radioactive and non-radioactive systems are sufficiently separated. The German utilities believe, that such system characteristics can be found also in other NPPs. Therefore, all German NPPs carry out related examinations and will decide about the necessity of back fitting measures. In addition to technical considerations of the utilities, the event has caused some discussions on the political level.

Canada 2004 News

Jean-Yves Gagnon, ISOE Chair

Major Accomplishments

Major Accomplishments in Canada include 3 CANDU units that were returned to service in 2004. After an administrative shutdown Bruce A, Units 3 & 4 were completely refurbished, and were restarted in June, 2004. Pickering, Unit 4, returned to full power operations in July 2004 after 900 days outage and 3.5 person-Sv dose.

Examples of major repairs are:

- Gentilly-2 and Point Lepreau Feeder Repair
- Pickering B Boiler Repair
- Pickering A and Bruce A Refurbishment
- Fuel Channel Replacement

Successful First CANDU ALARA Group Meeting in Oshawa, Ontario, June 2004

After a first attempt to established a CANDU ALARA Group meeting during the International ISOE ALARA Symposium in Anaheim, California in February 2001, it took three years to finally came with a successful first meeting of the Canadian CANDU ALARA Group meeting. Based on the US PWR and BWR ALARA Group, these meetings provides a forum for the sharing of ALARA operational experiences, lessons learned and good practices among different station's CANDU ALARA organizations.

During the 3 days of this first meeting, participants discussed and agreed on a set of Terms of reference for the Group. The meeting also shows that many stations were facing the same typical dose reduction challenges but without having a chance to benefit from the exchange of information.

The next meeting is schedule for January 13, 2005, combining with the International ISOE ALARA Symposium, in Miami.

Sponsor of the meetings is the ISOE North American Technical Centre (natcisoe.org).

Announcement of 2005 PWR ALARA Winter Meeting

North American Technical Centre has been chosen by the PWR RP ALARA Steering Committee to coordinate the PWR RP ALARA Committee, beginning on January 1, 2005, through December 31, 2007. NATC will support the PWR ALARA Benchmarking efforts under this program. The PWR RP ALARA Committee officially endorsed the ISOE program as a Good Industry Program in 1994. The committee is composed of 69 US PWR units, 3 Swedish PWR units and 59 EDF PWR units.
The committee meets twice per year for two days to exchange good ALARA practices

2005 PWR ALARA Winter Meeting will be held in Orlando, Florida, January 17 – 19. If you have any questions or comments please feel free to contact David Miller, e-mail address: DWMPhD@aol.com.

Steam Generator Replacement in Belgium

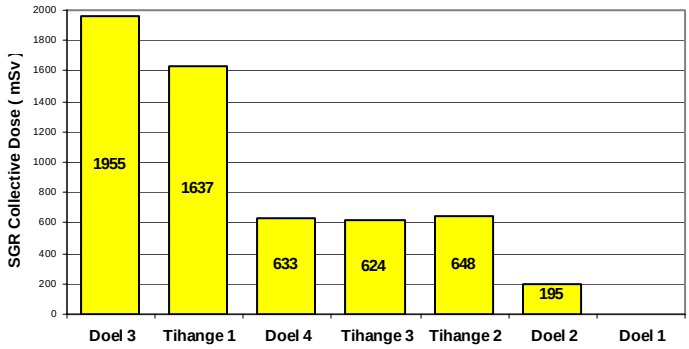
Els Thoelen, Radiation Protection Manager, Doel, Electrabel

The replacement of the two steam generators of the Doel-2 Unit took place during the outage May -July, 2004, adding up to 66 days. The main works performed in the outage were: replacement of the steam generators, inspection of the reactor vessel and the internal parts, inspection of SC and RC valves and replacement of cooling batteries of the reactor building ventilation.

Putting SG 2 into the reactor building, 28th of May

In order to remove the existing steam generators and install the new steam generators, it was necessary to make two holes in the primary steel liner and in the dome of secondary containment. The holes in the primary containment had a diameter of 5.5 m, the steel being 25 mm thick. The square holes in the secondary containment had a length of 5.5 m, the concrete being 80 mm thick. The fuel was removed, with the reactor building being maintained in an under-pressurised state for as long as possible during the operation.

Collective dose history of SGRs in Belgium



The dose allocated to this replacement of the steam generator was kept to 195.5 man-mSv. This success was the result of experience from previous replacements, a successful decontamination of the primary circuit, a well studied shielding with 70 tonnes of lead, and operational planning with a maximum attention to ALARA, for example: keeping the steam generators, that had to be replaced, filled with water for as long as possible.

Regulatory Inspection Activities Related to Radiation Protection

NEA Committee on Nuclear Regulatory Activities (CNRA) and its working group has prepared a compendium of commendable inspection practices. These are neither international standards nor guidelines but serve as a useful reference when each country reviews and improves their inspection practices. Commendable practices are related to:

- Radiation Protection Inspection Authorities
- Licensee's Radiation Protection Organisation
- ALARA – Implementation
- Effectiveness of Licensee's Radiation Protection Programme

Detail information is available in the NEA document CNRAR(2001)4 - Javier.Reig@oecd.org.

About Dose Constraints and Dose Limits (ICRP 1990 vs. 2005)

Ted Lazo, OECD, Nuclear Energy Agency
Borut Breznik, Krško NPP, Slovenia

Dose Constraints were first mentioned in ICRP Publication 60, 1990

The methods used in the optimization of protection tend to emphasize the benefits and detriments to whole group of exposed individuals (or in the society to population). Optimization of protection may introduce a substantial inequity between one individual and another. This inequity can be limited by incorporating source-related instructions on individual dose into the process of optimization. The Commission (ICRP) calls these source-related dose constraints, previously called upper bounds. They form an integral part of the optimization of protection. For potential exposures, the corresponding concept is the risk constraint.

An important feature of optimization is the choice of dose constraints, the source-related values of individual dose used to limit the range of options considered in the procedure of optimization. For many types of occupation, it is possible to reach conclusions about the level of individual doses likely to be incurred in well-managed operations. This information can then be used to establish a dose constraint for that type of occupation. It will usually be appropriate for dose constraints to be fixed at the national or local level.

The Need for both Limits and Dose Constraints

Dose limits are needed as part of the control of occupational exposure both to impose a limit on the choice of dose constraints (to cover the occasional case where the same individual is employed on several tasks each with its own constraint) and to provide protection against errors of judgement in the application of optimization.

What do Dose Limits Represent?

The Commission has found it useful to use three words to indicate the degree of tolerability of an exposure (or risk). They are necessarily subjective in character and must be interpreted in relation to the type and source of the exposure under consideration. The first word is “unacceptable”, which is used to indicate that the exposure would, in the Commission’s view, not be acceptable on any reasonable basis in normal operation of any practice of which the use was a matter of choice. Such exposures might have to be accepted in abnormal situations, such as those during accidents. Exposures that are not unacceptable are then subdivided into those that are “tolerable”, meaning that they are not welcome but can reasonable be tolerated, and “acceptable”, meaning that they can be accepted without further improvement i.e. when the protection has been optimised. In this framework, the dose limit represents a selected boundary in the region between “unacceptable” and “tolerable” for the situation to which the dose limit is to apply, i.e. for the control of practices.

It is implicit in recommended dose limits from 1990 that the dose constraint for optimisation should not exceed 20 mSv in a year.

Flexibility of Application

Selection of dose limits necessarily includes social judgements applied to the many attributes of risk. These judgements would not necessarily be the same in all contexts and, in particular, might be different in different

societies. It is for this reason that the Commission intends its guidance to be sufficiently flexible to allow for national or regional variations. In the Commission's view, however, any such variations in the protection of the most highly exposed individuals are best introduced by the use of source-related dose constraints selected by the regulatory agencies and applied in the process of optimisation of protection rather than by the use of different dose limits.

Old dose constraints (ICRP 1990) only apply to situations that are under control, called Practices.

The New Concept of Dose Constraints (Draft 2005 Recommendations)

The system of protection now recommended by the Commission is to be seen as a natural evolution of, and as a further clarification of, the 1990 Recommendations. The draft 2005 Recommendations establish restrictions on individual dose from specified sources in all situations (normal, emergency, as well as existing controllable exposure) within their scope. These restrictions should be applied to the exposure of actual or representative individuals. They provide a level of protection for individuals that should be considered as obligatory and not maintaining these levels of protection should be regarded as a failure. They are complemented by the requirement to optimise the level of protection achieved.

Maximum Dose Constraint

The most fundamental level of protection is the source-related restriction called the dose constraint. It is used to provide a level of protection for the most exposed individuals from a single source within a class of exposure. The Commission recommends the use of quantitative dose constraints to protect the most exposed individuals from all identified controllable sources.

Maximum dose constraints recommended for workers and members of the public from single dominant sources for all types of exposure situations that can be controlled are:

- Effective dose of 100 mSv in a year in emergency situations, for workers, other than for saving life or preventing catastrophic circumstances, and for public evacuation or relocation; and for high levels of controllable existing exposures;
- Effective dose of 20 mSv in a year applies into occupational exposure, for countermeasures such as sheltering, iodine prophylaxis in accidents…
- Effective dose of 1 mSv in a year would be the maximum public constraint in normal situations while in case of multiple dominant sources a figure of 0.3 mSv/y would be appropriate (Publication 77);
- The value of an effective dose of 0.01 mSv/year is the minimum constraint that should be considered for application in any situation. This value correspond to a low need for action, giving rise to trivial risk to the exposed individuals.

End-point of optimisation is not necessarily much different than before. While there is no pre-determined ending point for optimisation, regulatory authorities take a graded approach to their requirements, with decreasing regulatory concern for lower exposures. For those situations that require the inclusion of stakeholders beyond the regulatory authorities and the licenses, optimised protection solutions identified through stakeholder dialogues will most likely enjoy support, and will be more sustainable than solutions that are imposed.

Limits on Effective Dose (Draft 2005)

The Commission has concluded that the existing limits on effective dose that it recommended in Publication 60 (1990) continue to provide an appropriate restriction on total regulated doses in normal situations. Within a class of exposure, occupational or public, dose limits apply to sum of exposures from sources related to practices that are already justified in normal conditions. For occupational exposure:

"A limit on effective dose of 20 mSv per year, averaged over 5 years (100 mSv in 5 years) with the further provision that the effective dose should not exceed 50 mSv in any single year.

And for public exposure:

" The limit should be expressed as an effective dose of 1 mSv in a year. However, in special circumstances a higher value of effective dose could be allowed in a single year, provided that the average over 5 years does not exceed 1 mSv per year.

Considerations and Practical Conclusions

- The application of new Dose Constraints will not necessarily change optimisation "on the shop floor", but this will depend on regulatory application

- In some cases nuclear utilities are already using "corporate limits" or "individual dose indicators" to achieve goals with no individual exposures above 20 or 18 or 15 or even 10 mSv/year. They are already using dose constraints or are aligned to the future changes.

- The Commission has concluded that the existing limits on effective dose that it recommended in Publication 60 (1990) continue to provide an appropriate restriction on total regulated doses in normal situations.

- The regulatory application of the new recommendations will determine whether the change from 1990 to 2005 "helps or hurts". Unpractical is to force the regulations changes before new recommendations are finally released.

- Possible disadvantages are:

  New dose constraints could be implemented in a fashion that is more strict than currently for a single dominant source:

  – 20 mSv/year vs. 100 mSv/5year, for occupational exposures;
  – Less than 1 mSv/year, for public exposures.

  And there is no important scientific evidence to support more strictness. National regulations may need to be revised and the current "mindset" (for example practices vs. intervention) will need to evolve.

- Advantage is that a single approach to situations is easier to understand and to explain. The process is also inherently supported by stakeholder involvement, at an appropriate level and with appropriate stakeholders.