

# THE INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE AND RELATED IAEA ACTIVITIES IN THE EUROPE REGION

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## **Introduction**

The International Atomic Energy Agency (hereafter referred to as the Agency or the IAEA) is unique among international organizations concerned with radiation protection issues as having two functions, by Article III.A.6 of its Statute, to “establish or adopt ... standards of safety for protection of health and minimization of danger to life and property ... and to provide for the application of these standards...”. The basic requirements for radiation protection against exposure to ionizing radiation of workers, members of the public and patients are given in the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (hereafter referred to as the BSS) [1].

The objectives of the Agency’s Occupational Radiation Protection Programme, within the Division of Radiation and Waste Safety, are to encourage the global harmonization and optimization of occupational radiation protection in situations of exposures due to external radiation and intakes of radionuclides from both artificial and natural sources of radiation; and to have in place and ensure compliance with operational health and safety measures prescribed by the Agency on its premises and in occupational activities under its supervision or control. The Information System on Occupational Exposure (ISOE) forms an integral part of this programme and the purpose of this paper is to present the current status of ISOE and the IAEA activities in the Europe region in support of the ISOE.

## **Information System on Occupational Exposure (ISOE)**

ISOE is co-sponsored by the OECD Nuclear Energy Agency (NEA) and the IAEA, through an agreement reached in 1993, by which the IAEA is inviting those of its Member States with operating nuclear power plants not members of the OECD, to participate cost-free through the IAEA ISOE Technical Centre. Subsequently, the Agency has formed a Joint ISOE Secretariat with OECD/NEA.

According to the Terms and Conditions for the operation of ISOE, the objective of the ISOE Programme is to make available to participants:

- Broad and regularly updated information on methods to improve the protection of workers and on occupational exposure in nuclear power plants;
- A mechanism for dissemination of information on these issues, including evaluation and analysis of the data assembled, as a contribution to the optimization of radiation protection.

Thus ISOE is promoting and co-ordinating international co-operative undertakings in the area of protection of workers at nuclear power plants, at the same time providing a forum for communication between radiation protection experts.

The ISOE database, the world’s largest available database on occupational exposure, includes information on occupational doses for 452 reactors, both operating and in cold shut down or in some stage of decommissioning, operated by 72 utilities in 28 countries, as of December 2000. National regulatory authorities from 25 countries also participate in the ISOE



programme. The participation of 398 operating commercial nuclear reactors in the ISOE programme represents some 92% of the world's operating commercial nuclear reactors (total of 433).

ISOE is organized in a decentralized form, operated through ISOE Technical Centres. The ISOE Programme is directed by a Steering Group, which is responsible for policy decisions, and the overall programme direction. The joint NEA/IAEA Secretariat facilitates the work of the ISOE Steering Group, provides and manages communication with responsible NEA and IAEA bodies and organizes transfer of information and communication between Steering Group, Working Groups and Technical Centres. The ISOE Bureau, appointed by the Steering Group, manages the ISOE Programme, through the Joint Secretariat, between Steering Group meetings.

A growing number of Agency Member States are participating through the IAEA. As of 1 October 2001, there are eleven utilities and eight authorities from eleven countries participating in the ISOE, i.e. utilities in Armenia, Brazil, Bulgaria, China, Lithuania, Romania, Russian Federation, Slovenia, South Africa and Ukraine (representing 44 operating reactors) and the regulatory authorities in Armenia, Bulgaria, China, Lithuania, Pakistan, Romania, Slovenia and South Africa. The Technical Centres are responsible for the management of the databases, serve as contact point for the transfer of information to the participants, prepare information sheets and organize topical sessions and annual workshops. The IAEA is co-organizing the 3<sup>rd</sup> EC/ISOE Workshop on Occupational Exposure Management at Nuclear Power Plants will be held in Portoroz, Slovenia, in April 2002.

The ISOE communications network is an information pipeline to facilitate the real-time exchange of experience and information among participating utilities and authorities. The network consists of all ISOE participants as well as the four Technical Centres. Any participant - utility or authority - may question the network for information on a particular problem, technique, procedure, etc. The appropriate Technical Centre will perform a survey of all participants, via the other Technical Centres, collect and summarize the desired information, supply the information to the requester, and - if appropriate - prepare an ISOE information sheet for distribution to all other participants.

The ISOE database is divided into four parts including dosimetric information from commercial nuclear power plants in operation, such as the annual collective dose for normal operation and outages; plant-specific information pertinent to dose reduction; radiation protection related information for specific operations, jobs, procedures, equipment or tasks; and dosimetric information from nuclear power plants which are shut down or in the process of decommissioning.

All information included is supplied by participating utilities, who have full access to all data. Participating authorities have access only to a reduced database, including data from utilities in their own country. The ISOE database forms the basis for various types of data analysis and studies of occupational dose trends. Current information and trends can be found in the 1999 Annual Report of the ISOE Programme [2]. More detailed analyses of the data can be found in the ISOE information sheets.

### **IAEA activities in the Europe region related to ISOE**

Two very important tools for training on optimization of radiation protection have been made available to the ISOE participants. To introduce radiation protection optimization, especially in the nuclear industry, a software learning programme, RADIOR, has been developed with the financial support of the European Commission and the IAEA. RADIOR

(produced by PRODIDACT with collaboration of the CEPN) is now available on diskette from the IAEA in six languages (English, French, German, Russian, Spanish and Swedish). The English version is also available on the IAEA Web site and this Web application should facilitate translations into other languages.

The OECD document *Work Management in the Nuclear Power Industry* [3], which was developed by an Expert Group within the ISOE, is considered to be of great value in the optimization process in nuclear power plants. In order to make it accessible also for persons not familiar with the English language, the Agency has supported its translation into Russian as well as Chinese.

A Regional Project on Improving Occupational Radiation Protection in Nuclear Power Plants in Central and Eastern Europe and in the Republics of the former Soviet Union was launched in 1997 with the general objective of implementing the optimization principle in nuclear power plants in accordance with the BSS [1]. As of 2001, this project is followed by a Regional Project on Enhancing Occupational Radiation Protection in Nuclear Power Plants. The target countries are Armenia, Bulgaria, Czech Republic, Hungary, Lithuania, Romania, Russian Federation, Slovak Republic, Slovenia and Ukraine.

Highest priority within the project was, from the beginning, put on Workshops for Health Physics Groups, which have turned out to be very important occasions for information exchange, especially on RBMK and WWER reactors, for dose and dose rate comparisons and benchmarking. In addition, training has been the main element of the project. Two regional training courses on Optimization and Radiological Protection in the Design and Operation of Nuclear Power Plants were organized in co-operation with the European Commission, one in Prague, Czech Republic, in 1997 and one in St. Petersburg, Russian Federation, in 1999. These training courses were directed at those associated directly or indirectly with designing and implementing radiation protection programmes, including regulatory authorities, and the audiences were composed mainly of health physicists from nuclear power plants and regulatory authority staff.

The primary responsibility for optimization lies with the management and the commitment of senior management is an essential pre-requisite for successful introduction or continuation of an ALARA (As Low As Reasonably Achievable) programme. It was therefore considered to be very important to improve the awareness of optimization in this group. For this purpose, a Workshop on Implementation and Management of ALARA in Nuclear Power Plant Operation was held in the IAEA Headquarters in Vienna in 1998. Efforts were made to have presentations from peers, from the target countries as well as from the rest of Europe.

Regional training events such as those mentioned above have the advantage that the participants enter in contact with colleagues from other countries with different experiences, but with the disadvantage that very few persons from each country can take part. The strategy for these projects is therefore also to promote national training, for a country as a whole or locally in a nuclear power plant. Some nuclear power plants in the project were already organizing such training events, while others felt that they needed support to achieve this. It was recognized that the training events held under the project provided a very good basis for national training and an expert group, composed of experts from the target countries and the rest of Europe, was therefore convened to prepare training material on the application of the ALARA principle in nuclear power plants. The intention was to provide the material in English and Russian.

The first products from this work is available as IAEA Working Material on CD-ROM in English and Russian for use in the nuclear power plants. When feedback has been collected, a more long lasting product will be produced. Also, train the trainers events will be organized in countries where the need is identified.

The material produced consists of two different courses. ALARA Course 1, a half day course, is intended for the top management of nuclear power plants and regulatory staff from central regulatory offices. ALARA Course 2 is expected to last for 1½-2 days and will be given for chiefs in nuclear power plants and their deputies of operational, maintenance, radiation protection and other departments involved in the planning and performance of work in controlled areas, for foremen as well as local regulatory inspectors. The electronic course material for both courses includes: Lecturers Help, slides in PowerPoint and full text of reference papers (general and on examples of ALARA implementation). The Lecturers Help includes a description of the course (target group, aims, objectives, etc.), a list of the slides included (with an indication of the keyword for the slide, its main message and a reference to the paper it is based on), guidance for the performance of the different parts of the course (such as indications where local material should be introduced) and lists of reference papers and reference books.

## Conclusions

The ISOE programme will continue to be a very important part of the IAEA Occupational Radiation Protection Programme as will the related activities under the Technical Co-operation programme. Realizing the need for information exchange and promotion of the application of the ALARA principle in industries other than nuclear power plants, the Agency has recently initiated the creation of regional ALARA Networks. These are seen as an effective way to foster good working practices and the development of an ALARA culture. Further information on the IAEA radiation protection programme can be found in the Web page: [www.iaea.org/ns/rasanel](http://www.iaea.org/ns/rasanel).

## References

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