ACTIVITIES OF THE OECD NUCLEAR ENERGY AGENCY IN THE FIELD OF RADIOLOGICAL PROTECTION

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Introduction

The Nuclear Energy Agency (NEA) of the OECD was initially created as a European organisation (ENEA) in 1957. Japan joined the NEA in 1972, successively followed by Australia, Canada and the United States. The main aim of the NEA is to assist Member countries in the peaceful and safe development of nuclear power. The work of the Agency is carried out under the OECD Council by the Steering Committee for Nuclear Energy, which is assisted by a number of specialised committees including the Committee on Radiation Protection and Public Health (CRPPH) and the Radioactive Waste Management Committee (RWMC).

The CRPPH is responsible for the Agency's activities in radiological protection and related environmental problems. Its work includes the review and discussion of national radiation protection policies and practices, the review of progress of radiation protection philosophy, the interpretation of the ICRP Recommendations, and the study of the ways of their conversion into practical application in Member countries. The Committee also prepares technical studies and state-of-the-art reports on specific topics, as a reference material for national authorities and the radiation protection community.

The current priorities of work of the Agency are focused primarily on the nuclear fuel cycle, nuclear safety and radioactive waste management, including their major radiation protection implications, covering both technical and policy issues within those areas. In this context, the role played by the CRPPH is to define and assess relevant radiation protection and public health issues and to provide technical and policy guidance leading towards their resolution. At the same time, the Committee continues actively to pursue its traditional role as a permanent forum where national radiation protection and public health authorities exchange experience and views and co-ordinate their practices.

Three main areas of work can presently be identified in the Agency's radiation protection programme:

- Interpretation of the ICRP recommendations, and review of problems of application of these recommendations to practical situations and their transfer into national regulations.
- Radiation protection aspects of radioactive waste management.
- Protection of workers in the nuclear industry.

The Secretariat's activities for this work are carried out by the Agency's Division on Radiation Protection and Waste Management, with the assistance of international Expert Groups and technical consultants.

Radiation Protection Recommendations

Following adoption of new basic radiation protection norms in 1981 by NEA, jointly with the International Atomic Energy Agency (IAEA), the World Health Organization (WHO) and the International Labour Organization (ILO), the Agency organised through the CRPPH an international review of the difficulties likely to be encountered by national authorities in interpreting and applying the ICRP recommendations from which the IAEA/WHO/ILO/NEA Revised Basic Safety Standards are derived.

A number of clarifications were sought from the ICRP on the application of the principle of optimisation of protection, and two statements were made public drawing the attention of national regulatory authorities to two specific issues: the application of the ICRP principle of justification of practices and the introduction of a lifetime dose limit for radiation workers. The purpose of these statements was to try to avoid the introduction of discrepancies in national radiation protection regulations, which so far have shown a remarkable degree of consistency.

Other interesting achievements in this field are the recent preparation and issuing of a series of reports aimed at throwing light on controversial matters, such as, for example, the meaning of the average doses in groups of workers and their relationship with the ICRP dose limits, and the different meanings and uses, as well as limitations, of the concept of collective dose.

Radiation Protection in Radioactive Waste Management

Because of the very long times for which some wastes will remain radioactive, and the inevitable uncertainties associated with safety assessments projected far into the future, attention has been given to seeking a common understanding of how radiation protection objectives based on ICRP recommendations could be developed for application to waste disposal, particularly to its long-term aspects. This work, initiated in 1982, was completed in 1984 with emphasis on two main areas: the definition of objectives for the upper limit of radiation risk for individual members of the public, and the clarification of the role and limitations of collective dose assessments. The latter is particularly relevant to the development of methodologies to be applied to ensure that the overall detriment from waste disposal is as low as reasonably achievable.

A substantial effort was also made during the last few years in the examination of long-term aspects of uranium mill tailings management. The aim of this study was primarily to review the long-term radiological protection problems, and to illustrate the application of the ICRP principle of optimisation in the decision-making process concerning the selection of tailings management options.

Another field where the Agency plays a major role is the sea disposal of low-level radioactive waste. In this respect, the Agency ensures the operation of an international consultation mechanism which specifies general and radiological safety conditions for the sea dumping operations carried out by some Member countries under the London Dumping Convention. Under this

mechanism, the NEA is also responsible for an international surveillance over the execution of these operations, and co-ordinates the international assessment of the suitability of the dumping sites from the radiological protection viewpoint. This co-ordination also covers the associated international programme of environmental monitoring and research which is carried out by a concerted effort of a number of Member countries.

Protection of Workers in the Nuclear Industry

In the last few years the concern of experts and regulatory authorities has been progressively focused on the existence of some groups of workers in the nuclear industry exposed to levels of radiation risk which are higher than the general average risk of workers in that industry. These are the uranium miners and some groups of workers such as maintenance, inspection and health physics workers in nuclear facilities, particularly nuclear power plants.

Recognising the importance of these issues, the NEA has been carrying out for several years a vigorous programme in this field. In the area of uranium mining, the Agency has given in the last few years, and is still giving, a significant contribution through the promotion of studies and exchanges of information and the preparation of technical guidance. Expert Groups of the Agency have prepared technical reports on radon, thoron and their daughters dosimetry, metrology and monitoring. A correct dosimetry and monitoring can only be obtained from accurate and reliable instrumentation. To improve practices in this area the NEA, in co-operation with the CEC, is carrying out an important inter-calibration and intercomparison programme for dosimetry and monitoring equipment covering the whole OECD countries area.

As far as the increasing exposure of workers in nuclear plants is concerned, the need for a broadening of the data base available on this issue, as a foundation for improvements in plant design and operation, was felt by the NEA since 1977, and an international enquiry on the levels and trends of occupational exposure in nuclear facilities was carried out between 1978 and 1980. Although the results of this study were judged interesting and useful, the difficulties associated with the collection, analysis and comparison of large quantities of dosimetric data at the international level were recognised by the CRPPH. The Committee, therefore, decided to focus its attention on a more specific issue, namely the problem of the implication of nuclear safety-motivated decisions on the exposure of workers. Nuclear safety-related actions, aimed at reducing the probability and/or consequences of nuclear accidents, imply in fact in many cases an additional exposure of the workers for inspections, special maintenance, etc.

There is a growing feeling among experts that this situation may present an imbalance between the requirements of safety of plants, protection of the public and protection of the workers, and that there is, therefore, a need for a rational approach to find the optimum balance between these different requirements. The NEA is contributing to the solution of this difficult problem through the activities of a Group of Experts entrusted with the

task of reviewing available dosimetric data on occupational exposure, identifying those aspects which involve problems of balancing between plant safety and radiation protection requirements, and developing a conceptual approach for the determination of an optimum balance. The subject of this work involves delicate issues, such as the application of ICRP principles and approaches to probabilistic events as in nuclear accidents, and difficult conceptual decisions, such as the relative weight to be attributed to the protection of the workers and the reduction of the potential risks to the public.

The ICRP recommendations of 1977 have introduced a number of new issues in the approach and methods for the assessment and recording of doses to workers. In practice, radiation protection operators found it difficult to adapt fully to the approach recommended by the ICRP, partly because of problems of interpretation and partly due to technical limitations, such as the sensitivity of monitoring methods for the intake of some long-lived radionuclides. An attempt to reach an international consensus on these issues through the work of an NEA Group of Experts has recently achieved a successful outcome, and a set of practical recommendations addressed to operational health physicists and dosimetric services are being published by the Agency.

Other Activities

Although the main thrust of the Agency's radiation protection work is focused on the areas described above, the CRPPH continues to keep under review more general matters in order to contribute to put the radiological impact of nuclear energy in the proper perspective with other sources of human exposure.

In this context, the studies on radon, thoron and their daughters dosimetry, metrology and monitoring have been extended to include those aspects which are more relevant to the exposure of the public, notably in dwellings. Also, a working group of the Agency is preparing a guide on the radiation protection aspects of the commerce, use and regulation of consumer products containing radioactive materials, which incorporates the most recent developments of the ICRP doctrine and will replace the NEA Guidelines on Consumer Goods, which were published in 1970.

A more exhaustive description of the Agency's organisation and activities as well as a list of the NEA publications relevant to radiation protection are given in the booklet "International Co-operation in Radiological Protection, OECD Nuclear Energy Agency, 1984"* issued by the Agency on the occasion of the IRPA 1984 Congress.

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*Provisional title.