



INTERNATIONAL ATOMIC ENERGY AGENCY
Department of Nuclear Safety, Division of Radiation and Waste Safety

Specialists Meeting on
Protection of the Environment from the Effects of
Ionizing Radiation: International Perspectives
(Reference: 723-J9-SP-1114.3)

IAEA Headquarters, Vienna, 26–29 November 2001

SUMMARY MEETING REPORT

This meeting was attended by around 60 experts from 19 Member States and 6 international organizations. The meeting provided an opportunity for both information exchange, regarding appropriate regulatory and research developments, and for detailed discussion of many of the issues being addressed as part of the development of guidance on protection of the environment from the effects of ionizing radiation. Agency Working Material provided a starting point for discussions, which were facilitated by formation of 3 Working Groups on:

1. Implications of General Protection Principles on the Development of a System of Environmental Protection from the Effects of Ionizing Radiation;
2. Application and Specification of Endpoints;
3. Selection of Reference Biota.

Working Group Discussions

Working Group 1 concluded that the ideas on ethics and principles, outlined in the Working Material, generally provided a reasonable basis for developing a framework for protection of the environment. There was seen to be a need to distinguish protection of biota from protection of the environment, which includes abiotic components. However, it was agreed that the initial focus should be on the protection of biota. Harmonization of the approach adopted to protect the environment from radiation with those for chemicals was seen as being desirable. It was also suggested that the concepts and tools (such as the precautionary approach and ALARA), incorporated in different protection systems, should be considered so that those best suited to a framework for protection of biota from radiation should be identified and incorporated as appropriate.

Working Group 2 affirmed the use of the 4 effects or protection endpoint categories and the 2 main assessment endpoints (dose/dose rate and concentration) described in the Working Material. The Working Group discussed issues relating to: biomonitoring, effects due to combined exposures, natural background and its variability, dose and dose rate estimation and future research priorities. Working Group 2 also developed three concepts for protection of the environment: a hierarchy of levels (criteria) for effects on the environment; public acceptance (societal concerns); and levels of concern/consideration as multiples of background. However, a detailed discussion of the third concept was considered to be an environmental management issue, rather than an assessment endpoint issue, and was thus beyond the scope of this Working Group.

Working Group 3 agreed that the use of reference organisms is a reasonable approach to adopt in the development of a system to protect biota from the effects of ionizing radiation. In accepting this, it was recognized that effects on higher levels of organization (e.g. populations) occur only if individual organisms are affected, and that effects data are generally available for individuals rather than higher levels of organization. A list of criteria to be considered when selecting reference organisms was developed, which addressed societal demands, ecological characteristics, and technical aspects. It was recognized that reference organisms can be integrated within a tiered approach, for example to demonstrate regulatory compliance. A tiered approach provides flexibility; ability to iterate through the evaluation process, and to address multiple environmental assessment scenarios and user needs.

Conclusions

It was agreed it is necessary to develop a system for the protection of the environment (or biotic components of it) from the effects of ionizing radiation. This development should take account of, but should not be restricted by, the current state of knowledge. A consideration of developments in environmental protection from other pollutants should be included in this process, and assumptions and limitations inherent in the approach adopted should be clearly identified.

The need for international co-ordination and cooperation was recognized. There are a number of international organizations with interests in this subject area, and it is essential to avoid duplication of effort and inconsistencies in developing approaches. The Agency would have a valuable role in this regard.

In the interests of further development of the results of this meeting, it was suggested the meeting reports be made available to participants of the related symposium in Darwin in July 2002. Furthermore, it was suggested that it may be useful to hold an additional Specialists Meeting in Vienna in late 2002 which would include an overview of the various international conferences and meetings taking place in 2002.

The Agency was encouraged to continue working towards the development of Safety Standards that are practically based, and to submit the current Working Material to a wide audience with a spectrum of perspectives relating to environmental protection.

The Agency was also identified as having a potentially valuable role in the following areas: consideration of the way in which effects manifested in individuals are expressed on higher levels of organization (populations, communities and ecosystems); development of a compilation of transfer factors from different sources, that would be available via the Internet.

Additional research priorities identified include: development of a better understanding of the mechanisms by which radiation exposure relates to protection endpoints and relevant dose-response relationships and an appropriate definition of quantities and units.

Lars-Erik Holm, Meeting Chairman