

## Protection of Non-human Species from Ionising Radiation

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### Extended Abstract

Environmental protection has made substantial progress since the preparation of Publication 60 of ICRP [IC91]. The increasing public concern over environmental hazards has led to the emergence of a variety of national and international legal commitments for protection of the environment. These commitments demonstrate a generally held view that an explicit means of demonstrating protection of biota and ecosystems from harmful effects of ionising radiation is needed, and may often be legally required.

ICRP's current position regarding protection of the environment is set out in its Publication 60: "*The Commission believes that the standards of environmental control needed to protect man to the degree currently thought desirable will ensure that other species are not put at risk*" [IC91]. Up till now, the ICRP has not published any recommendations as to how protection of the environment should be carried out. The Commission set up a Task Group in the year 2000 to address this issue. The Task Group received a large number of comments, made at various stages of its drafts, from informal contacts, presentations at meetings etc. It also received information by liaison/ membership of other working groups, and its draft report was subjected to international consultation via ICRP's website on the Internet. From this consultation, the Task Group received 25 comments mainly from national and international organisations (e.g., the Nuclear Energy Agency and the World Nuclear Association). The comments were, with a few exceptions, generally supportive. In January 2003, the Commission adopted the Task Group's Report, which addresses the role that ICRP could play in this area [IC03].

ICRP has decided that a systematic approach for radiological assessment of non-human species is needed in order to provide the

scientific basis to support the management of radiation effects in the environment **[CI03]**. This decision to develop a framework for the assessment of radiation effects in non-human species has not been driven by any particular concern over environmental radiation hazards. It has rather been developed to fill a conceptual gap in radiological protection and to clarify how the proposed framework can contribute to the attainment of society's goals of environmental protection by developing a protection policy based on scientific and ethical-philosophical principles.

The proposed system does not intend to set regulatory standards. The Commission rather recommends a framework that can be a practical tool to provide high-level advice and guidance and help regulators and operators demonstrate compliance with existing legislation.

ICRP will develop a small set of reference fauna and flora, plus their relevant data bases to serve as a basis for the more fundamental understanding and interpretation of the relationships between exposure and dose, and between dose and certain categories of effect, for a few but clearly defined types of animals and plants. This concept is similar to that of the reference individual (Reference Man) used for human radiological protection, in that it is intended to act as a basis for calculations and decisions. It is intended that each reference organism would serve as a primary point of reference for assessing risks to organisms with similar life cycles and exposure characteristics. More locally relevant information could be compiled for any other fauna and flora; but each such data set would then have to be shown to be related in some way to the reference organisms. The magnitude of doses relating to effects will be set out in a 'banded' fashion, such as the proposed derived consideration levels, in a manner similar to the levels of concern being considered for human beings. Such a set of information could then serve as a basis from which national bodies could develop, as necessary, more applied and specific numerical approaches to the assessment and management of risks to non-human species as national needs and situations arise.

A framework for radiological protection of the environment must be practical and simple. Ideally, a set of ambient activity concentration levels would be the simplest tool. There is thus a need for international standards of discharges into the environment. This could be a task for other international organisations, such as the International Atomic Energy Agency. In order to transparently

demonstrate the derivation of ambient activity concentration levels or standards, the use of reference organisms will be helpful.

In January 2003, the Main Commission decided to set up a new Task Group to continue the work with defining effects end-points of interest, the types of reference organisms to be used by ICRP, and defining a set of reference dose models for assessing and managing radiation exposure in non-human species.

The Commission's system of protection has evolved over time as new evidence has become available and as our understanding of underlying mechanisms has increased. Consequently the Commission's risk estimates have been revised regularly, and substantial revisions made at intervals of about 10-15 years. It is therefore likely that any system designed for the radiological protection of the environment would also take time to develop, and similarly be subject to revision as new information is obtained and experience gained in putting it into practice.

## REFERENCES

- [CI03] Clarke R, Holm L.-E. ICRP's Policy on the Environment. Editorial. ICRP Publication 91, Annals of the ICRP. In press.
- [IC91] 1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60. Annals of the ICRP 21, 1-3.
- [IC03] A Framework for Assessing the Impact of Ionising Radiation on Non-Human Species. ICRP Publication 91, Annals of the ICRP 33, in press.

