

Resolution of Public Consultation Comments for

ICRP Publication 148: Radiation Weighting for Reference Animals and Plants

Annals of the ICRP 50(2) 2021

Background

ICRP is grateful for the time and effort taken to review and comment on the draft of this publication during the public consultation period. Active public consultations are a valuable part of developing high-quality publications. Comments are welcome from individuals and organisations, and all are considered in revising the draft prior to publication.

To ensure transparency, comments are submitted through the ICRP website and visible by visiting www.icrp.org.

This document summarises the general themes of the comments and how they were considered during preparation of the final report for publication.

Public Consultation

This draft report was available for public consultation from 20th November 2018 to 3rd March 2019. The following individuals and organisations provided comments: Anki Hägg, Swedish Radiation Safety Authority; Bernd Lorenz, European Nuclear Installations Safety Standards (ENISS); and Christelle Adam, Institut de Radioprotection et de Sûreté Nucléaire (IRSN).

Resolution of Comments

While the use of radiation weighting factors is applied in human radiation protection, ICRP until the present time had yet to formally recommend their use in conjunction with protection of the environment. The new report '*Radiation Weighting for Reference Animals and Plants*' provided much needed guidance. However, in assessing the reviewers' comments, it is apparent that the recommendations were not without controversy. The public comments ranged from complementary to critical, with concern expressed over the paucity of data. The following sections broadly characterize the nature of the comments received and the rationale used in revising the report to address them.

Relative Biological Effectiveness for Tritium Beta Particles

Several comments focused on decisions to limit the review to one low-energy beta emitter, specifically to tritium, rather than including other low energy electron emitters, or simply categorising the effects by electron energy. The greatest challenge faced by the report authors was the paucity of data that could be utilised for developing the weighting factors. It is recognised by the authors that this report represents a starting point.

Relative Biological Effectiveness of Alpha Particles

The selection of a radiation weighting factor of 10 for alpha particles was considered too large in one review. While the data are limited, the decision was made to keep the weight at 10 due to the wide range in experimentally observed values for deterministic effects.

Limited Data

All reviewers noted the limited data available to produce this report. In particular the lack of information on plants. Also, there was a question of about the relevance of this data to late effects. In acknowledgement, the authors incorporated additional text to emphasise the importance of these issues.

Stochastic Effects

There was debate about the relevance of including stochastic effects as part of the process to derive a radiation weighting factor for biota. A concern was expressed about stochastic effects being viewed as less relevant than tissue reactions, and not adequately considered in the report. Unfortunately, there are few studies which look at mutations, cancer, and heritable effects on populations. Consequently, for this publication the data were reported but not included as part of the final assessment.

Selection of Weighting Factors

The selection of an initial weighting value of 1 for tritium beta particles was met with some discussion. There was a recommendation to have a range of values offered. There was also a request for clarity when to apply the radiation weighting factor and how to compare to the DCRLs. The guidance in the final report was refined to make it clear that the weighted dose would be compared to the DCRLs. The report also emphasises the need for critical examination of available data in circumstances where tritium is a dominant contributor to exposure, and such exposures are close to the DCRL, which might suggest a higher weighting factor be applied.

Overall Conclusions and Recommendations

It was recognised by the authors that the available data is limited, the number of species examined was small, and the radionuclides considered was limited. However, this review and recommendations are important in moving consideration of protection of the environment to a manner more consistent with other aspects of radiation protection.