

## **U.S. Nuclear Regulatory Commission Comments On the 2007 Draft Recommendations of the International Commission on Radiological Protection**

The U.S. Nuclear Regulatory Commission (NRC) would like to take this opportunity to offer its views on the draft recommendations of the International Commission on Radiological Protection (ICRP) and provide a number of editorial changes for consideration by the Main Commission. We commend the openness and responsiveness of the ICRP by making drafts available for public review and comment. The most recent draft, posted to the Internet on January 12, 2007, represents a considerable revision from the earlier 2006 draft on which the NRC commented. The revised text is vastly improved and the ICRP should be commended for considering and incorporating many of the comments that it received during the last public consultation and from the three international workshops sponsored last year by the Nuclear Energy Agency.

In a progress report posted to the ICRP web site on January 12, 2007, the ICRP invited editorial comments on the 2007 draft recommendations and requested that these comments be sent to the Scientific Secretary of the ICRP. The comments that follow and a Microsoft Word copy of the draft recommendations with track changes is provided for your review and consideration. The draft recommendations require a thorough editorial review. There are numerous instances where text and section numbers do not agree; there is inconsistent use of terms and phrases; and there are numerous instances where documents referred to in the text are not yet drafted, being drafted, under review, or in press. Missing citations have been added to the reference list. In addition, new or additional text is provided to help clarify vague statements or provide alternative language for ICRP consideration.

### General Comments:

The NRC endorses radiological protection recommendations that can enable tangible improvements in providing adequate protection of public health and safety, and that can be implemented by practitioners and regulatory authorities in a practical, timely, and cost effective manner. Unfortunately, this document does not add significant value to the radiation protection programs in the United States, especially those promulgated by the NRC for its licensees. The ICRP acknowledges that there has not been any significant change in information related to radiation risks and that there is no hurry to implement any of the draft recommendations. At this point, there is no compelling public health and safety argument to make any changes to our national regulations to implement the recommendations contained in the 2007 draft document, nor for other national authorities, who previously adopted the 1990 Recommendations of the ICRP, to adopt the 2007 recommendations.

The ICRP should continue to review the scientific literature and encourage the scientific community to develop new techniques in order to better elucidate the biological effects attributable to very low radiation doses and to develop documents that relate such effects to the needs of radiological protection. For radiological protection purposes, the ICRP advocates the use of a linear no-threshold dose response model to predict the health consequences of exposures below 100 mSv. However, there is very little technical data for health effects directly attributable to radiation exposures of regulatory importance (10's to 1,000's  $\mu$ Sv). The ICRP

should strive to develop realistic models that best predict the development of stochastic health effects without incorporating an undue amount of excess conservatism into their predictions.

The NRC believes that the recommendations of the ICRP should be based on the best scientific information that is publicly available and published in peer-reviewed technical journals. Technical information that is not publicly available should be excluded from consideration by the ICRP, regardless of its source. It is disconcerting that some of the information used by the ICRP to develop the 2007 recommendations is either unpublished or not publicly available (e.g., an UNSCEAR 2006 report). An information cut off date should be set by the ICRP and any new information published after this date should not included in that particular ICRP publication.

The NRC believes that the proposed changes to the tissue weighting factors and nominal risk coefficients for cancer and hereditary disease will have the greatest impact on regulations promulgated by national authorities. However, the process used to revise these values was not transparent and may be based on unpublished data. Again, the ICRP should strive to use peer reviewed information only. For example, reports published by the United Nations Scientific Committee on Effects of Atomic Radiation (UNSCEAR) and the U.S. National Academies specifically note in which tissues statistically significant radiation-induced health effects are observed at low doses and, more importantly, these reports identify those tissues where there is little or no evidence for an association between radiation exposure and cancer. As a result, several sites (e.g., prostate, pancreas, and others) should be removed as remainder tissues from the tissue weighting factors. The ICRP should not adopt a new set of tissue weighting factors or nominal risk coefficients until:

- (1) the assessment of the atomic bomb data is completed,
- (2) these assessments are published as articles in peer-reviewed journals, and
- (3) these articles are reviewed and evaluated by UNSCEAR.

The NRC does not believe that it is necessary to develop a framework for radiological protection of non-human species and it is opposed to the future development of separate standards for the protection of flora and fauna. Accordingly, the NRC strongly encourages the ICRP to remove Chapter 8, "Protection of the Environment," from the ICRP recommendations.

The ICRP has clarified the meaning and use of dose constraint and its use in the optimization of radiation exposure for planned exposure situations. However, the ICRP should provide stronger statements to further discourage the misuse of the collective dose concept and to provide guidance on the limited appropriate uses of collective dose. The ICRP needs to provide clear guidance with numerical examples of when it is, and is not, appropriate to use collective dose.