



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
ADVISORY COMMITTEE ON NUCLEAR WASTE  
WASHINGTON, DC 20555 - 0001

ACNWR-0244

July 18, 2006

The Honorable Dale E. Klein  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: THE 2006 DRAFT RECOMMENDATIONS OF THE INTERNATIONAL  
COMMISSION ON RADIOLOGICAL PROTECTION

Dear Chairman Klein:

During the 172<sup>nd</sup> Meeting of the Advisory Committee on Nuclear Waste (ACNW or the Committee), July 17-20, 2006, the Committee continued its review of documents published by the International Commission on Radiological Protection (ICRP). The Committee has previously offered comments in letters dated November 3, 2004, July 1, 2005, and June 8, 2006. In this current letter, the Committee comments on the revised 2006 Draft Recommendations available from the ICRP Web site on June 7, 2006, based on its own review of the revised recommendations and briefings by U.S. Nuclear Regulatory Commission (NRC or the Commission) staff at the 172<sup>nd</sup> ACNW Meeting.

## **OBSERVATIONS**

The Committee offers several specific observations on the revised 2006 Draft ICRP Recommendations.

1. The Committee observed that the risk coefficients are different from those in the BEIR VII report and ICRP Publication 60. These differences arise from five changes regarding the following:
  - a. organ weighting factors
  - b. treatment of lethal cancer and life impairment
  - c. construct for estimating hereditary effects
  - d. hypothetical population at risk
  - e. population transfer from Japanese A-bomb survivors

The revised 2006 Draft Recommendations make an important point regarding risk estimates:

“In summary, the Commission considers that while the nominal risk estimates are now slightly smaller than in 1990, for practical purposes the risk is in the same order of magnitude as before. Thus, the approximate overall risk coefficient of about 0.00005 per mSv on which the current international radiation safety standards are based continues to be appropriate for purposes of radiological protection.”

The Committee concurs with this statement and concludes that on this basis a fundamental change to NRC radiation protection standards is not needed at this time. The Committee further notes the NRC staff concerns regarding references to unpublished work, and the need to ensure that the recommendations reflect the current state of knowledge. The Committee concurs with the NRC staff view that ICRP should not adopt a new set of tissue weighting factors and nominal risk coefficients until the assessment of the A-bomb data is completed and published.

2. The Committee observed the ICRP's statements on collective dose and its appropriate use. The revised 2006 Draft Recommendations state the following:

“(57) However, the Commission emphasizes that whilst the LNT hypothesis remains a scientifically plausible element in its practical system of radiological protection, biological information that would [un]ambiguously [sic] verify the hypothesis is unlikely to be forthcoming (see also UNSCEAR 2000). Because of this uncertainty on effects at low doses the Commission judges that it is not appropriate, for the formal purposes of public health, to calculate the hypothetical number of cases of cancer or heritable disease that might be associated with very small radiation doses received by large numbers of people over very long periods of time. On this point, the Commission also emphasizes that its estimates of nominal risk coefficients (Table 2 and Annex A) relate to contemporary human populations and depend upon current information on baseline disease rates, disease detriment and associated biological/clinical features. These factors are certain to change substantially over future generations and this adds to the implausibility of attempting to project the magnitude of radiation-associated disease far into the future.”

The Committee notes and concurs with statements in paragraph 57. The Committee agrees that it is not appropriate to calculate the hypothetical number of cases of cancer or heritable disease that might be associated with very small radiation doses received by large numbers of people over very long periods of time.

The Committee also believes the statement in paragraph 147 on the usefulness of collective dose as an instrument for optimization is consistent with its letter of September 20, 2005. The Committee affirms its previous observations and recommendations on the use of collective dose as noted in its letter.

3. The Committee continues to believe that the section on “Optimization” in the revised 2006 Draft Recommendations contain substantially the same requirements as the current ALARA programs for the protection of workers, the public, and the environment. In addition, the Committee believes that the principles of stakeholder involvement are consistent with the Commission’s current programs and activities as discussed in NRC’s Strategic Plan and implementing documents.

Power reactors and other licensees currently implement NRC regulations through the use of various administrative action levels as part of their radiation protection programs and ALARA. Although the terminology may be different, this implementation of NRC

regulations is consistent with international recommendations regarding optimization for radiation protection practice for many NRC or Agreement State licensees. Introducing new terminology would not add value.

4. Regarding the section on the protection of the environment, the Committee holds the same view expressed in its briefing to the Commission in March 16, 2005: there has been no evidence to contradict the principle that by protecting man the environment is protected. The Committee continues to believe these revised 2006 Draft Recommendations fail to make the case that separate recommendations are needed or justified.
5. The Committee concurs with the comments presented by NRC staff in their briefing to ACNW on July 17, 2006. The Committee has not duplicated NRC staff comments because the staff will provide a separate, detailed report to the Commission. The Committee appreciates the staff's excellent work to conduct a detailed review on a very tight time schedule and in its timely communications with the Committee.

## **RECOMMENDATIONS**

1. The Committee continues to recommend that the Commission implement the changes regarding radiation weighting factors, as suggested in the revised 2006 Draft Recommendations. The Committee believes that these are not urgent and can be considered when NRC changes its regulations for other reasons.
2. It is apparent that some of the reference documents used as foundation for the most recent ICRP risk factors are not complete and/or publicly available. Therefore, the Committee is modifying its recommendation of July 1, 2005, to defer consideration of tissue weighting factors until these references are available in final form and after the NRC staff has made a thorough analysis of this information.
3. The Committee believes that radiation protection practice for activities regulated by the NRC are consistent with the revised 2006 Draft Recommendations although the equivalency may not be clear because of differences in terminology. The Committee recommends that NRC carefully analyze the benefits and detriments of modifying its terminology before changing NRC regulations.
4. The Committee continues to believe, consistent with its previous letters, that the ICRP's "Recommendation for Protection of the Environment" are without foundation. There is currently no basis for this part of the revised 2006 Draft Recommendations to be considered further.

5. The Committee recommends that the staff continue to remain cognizant of the work of the ICRP and to identify and evaluate anything that would significantly enhance NRC-regulated radiation protection practices.

Sincerely,

**/RA/**

Michael T. Ryan  
Chairman

References:

1. Report dated November 3, 2004, from Michael T. Ryan, Chairman, ACNW, to Nils J. Diaz, Chairman, NRC, Subject: The 2005 Recommendations of the International Commission on Radiological Protection.
2. Report dated July 1, 2005, from Michael T. Ryan, Chairman, ACNW, to Nils J. Diaz, Chairman, NRC, Subject: Comments on ICRP Foundation Documents - A Followup to the ACNW's November 3, 2004 Comments.
3. Report dated June 8, 2006, from Michael T. Ryan, Chairman, ACNW, to Nils J. Diaz, Chairman, NRC, Subject: Comments on ICRP Draft Document - Scope of Radiation Protection Regulations (Spring 2006 Version).
4. ICRP (International Commission on Radiological Protection), February 27-June 5, 2006 Draft Recommendations of the International Commission on Radiological Protection available at: [http://www.icrp.org/docs/ICRP\\_Recs\\_02\\_276\\_06\\_web\\_cons\\_5\\_June.pdf](http://www.icrp.org/docs/ICRP_Recs_02_276_06_web_cons_5_June.pdf).

- 5. The Committee recommends that the staff continue to remain cognizant of the work of the ICRP and to identify and evaluate anything that would significantly enhance NRC-regulated radiation protection practices.

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Michael T. Ryan  
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- 1. Report dated November 3, 2004, from Michael T. Ryan, Chairman, ACNW, to Nils J. Diaz, Chairman, NRC, Subject: The 2005 Recommendations of the International Commission on Radiological Protection.
- 2. Report dated July 1, 2005, from Michael T. Ryan, Chairman, ACNW, to Nils J. Diaz, Chairman, NRC, Subject: Comments on ICRP Foundation Documents - A Followup to the ACNW's November 3, 2004 Comments.
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- 4. ICRP (International Commission on Radiological Protection), February 27-June 5, 2006 Draft Recommendations of the International Commission on Radiological Protection available at: [http://www.icrp.org/docs/ICRP\\_Recs\\_02\\_276\\_06\\_web\\_cons\\_5\\_June.pdf](http://www.icrp.org/docs/ICRP_Recs_02_276_06_web_cons_5_June.pdf).

\* See previous concurrence.

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