



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

November 3, 2004

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: THE 2005 RECOMMENDATIONS OF THE INTERNATIONAL COMMISSION
ON RADIOLOGICAL PROTECTION

Dear Chairman Diaz:

During its 154th meeting on October 19-21, 2004, the Advisory Committee on Nuclear Waste (ACNW) held a working group meeting (WGM). The meeting included presentations from staff and experts regarding the most recent draft recommendations of the International Commission on Radiological Protection (ICRP). These draft recommendations were also presented to staff and the public at NRC headquarters on September 15, 2004, by the Chairman of ICRP, Dr. Roger Clarke, and the Vice Chairman (and Chairman-Elect) Dr. Lars-Erik Holm. The Committee was represented at the September 15 presentations.

The ACNW WGM was held (1) to develop the information necessary to provide a letter report to the Commission, (2) to understand the technical bases for the draft 2005 ICRP recommendations, (3) to review these recommendations against current NRC regulations and practice; and (4) to identify aspects of the draft ICRP recommendations that may need further study. The Committee heard presentations and discussions by:

Donald Cool, NRC staff and ICRP Committee 4 (practical applications); Vince Holahan, NRC staff; Keith Eckerman, ORNL & ICRP Committee 2 (dosimetry); Michael Boyd, EPA; Edgar Bailey, State of California and Conference of Radiation Control Program Directors; Richard Vetter, Mayo Clinic and Advisory Committee on Medical Uses of Isotopes (ACMUI) member; Dana Powers, member of the Advisory Committee on Reactor Safeguards (ACRS).

The draft ICRP recommendations cover eight areas:

- Radiation quantities
- Biological aspects
- ICRP's general system of protection
- ICRP's quantitative recommendations
- Concepts of optimization
- Exclusions from the recommendations
- Medical exposures of patients as a separate issue
- A proposal for protection of the environment

There are various incremental changes in the first seven areas, including radiation- and tissue-weighting factors, new definitions for dosimetric quantities, and further discussion of the ICRP's concepts of justification of practices, source constraints, and dose limits. An important point about these draft recommendations is that ICRP's quantitative recommendations for workers

and members of the public have not changed since their 1990 recommendations, as published in ICRP Publication 60.¹ ICRP characterizes this update as a “simplification and elaboration” of its previous recommendations.

The eighth item is a proposal on radiological protection of non-human species. ICRP will form (mid-2005) a new committee to develop this proposal. The ACNW recommends that no action be taken at this time and that the NRC staff remain cognizant of the ICRP activities in this area until more details about ICRP’s proposals are forthcoming. The Committee believes this is consistent with the Commission’s documented direction to the staff.²

The Committee and the NRC staff cannot completely review the draft ICRP recommendations since the five comprehensive “foundation documents” (which give the scientific basis for the recommendations) are not yet available. Some of these foundation documents are expected soon. Others were reported by expert panel members to be still in progress.

The remainder of this letter concerns the draft ICRP recommendations in the first seven areas.

The unanimous view from expert panel members at the WGM was that there would likely be no significant improvement in the protection of worker and public health and safety by adopting these draft recommendations. Expert panel members identified potential difficulties, including confusion in the ICRP’s use of terminology, confusion regarding ICRP’s use of concepts such as safety culture without clear definition, and the application of the ICRP quantitative recommendations to U.S. licensees. Expert panel members did note that several elements of the recommendations would be improvements to the scientific basis. Some other elements need further consideration:

1. Without sufficient time to study and understand the foundation documents, it does not seem reasonable that the Draft ICRP recommendations should become final in June 2005. The Committee believes that the ICRP should allow more time for comment.
2. In its discussion of optimization, ICRP introduced the concept of “safety culture.” It would be better if the ICRP specified the attributes of safety culture it finds important, rather than simply saying safety culture is part of optimization.
3. The Committee finds the current ICRP recommendations to be sufficient regarding “optimization.” The Committee questions whether the draft ICRP recommendations are really improvements. ALARA as practiced in the U.S. provides a framework for accomplishing much of what the ICRP says about “optimization.” ALARA is well understood and ALARA programs identify both dose reduction opportunities and other safety issues. The draft ICRP recommendations would unnecessarily complicate existing ALARA principles and applications with new terminology or dimensions.

¹ICRP (1991) 1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60. Ann. ICRP 21 (1-3), Pergamon Press, Oxford.

²Memorandum from A. Vietti-Cook, to W. Travers, EDO, “Staff Requirements - SECY-04-0055 - Plan for Evaluating Scientific Information and Radiation Protection Recommendations,” ML041340304, May 13, 2004.

4. In the U.S. the term “best available technology” is a legal term and has ramifications that may not be consistent with ICRP objectives. ICRP should explain the application of “best available technology” within an optimization process for control of emissions to the environment.
5. In the U.S. there is a well-defined system of protection that is based on the relationship between radiation dose and risk. This relationship is not evident in the draft ICRP recommendations. The Committee believes that the draft ICRP recommendations would be improved by a detailed discussion of this relationship and its use in protecting the public.
6. The Committee believes that the ICRP goal of simplifying its terminology has not been achieved. For example, the term “constraint” in the draft ICRP recommendations has multiple meanings, some of which overlap with the meaning of the U.S. term “limit.” The draft ICRP recommendations use the term “failure” to indicate not meeting a constraint. This may or may not mean that a legal or regulatory limit has been exceeded. These are examples of the confusion that can arise in trying to interpret and translate the terminology from the draft ICRP recommendations into practice.

RECOMMENDATIONS

The Committee believes that the Commission should consider deferring action on any of the draft ICRP recommendations until BEIR VII is published and available for review. Further, the expert panel members identified several items in the draft ICRP recommendations that could enhance the current regulations or radiation protection guidance. The Commission should consider three of these items as it deliberates on its response to the draft ICRP recommendations:

1. The radiation weighting factors for neutrons and protons (quality factors in 10 CFR Part 20)
2. The tissue-weighting factors that reflect the ICRP’s current thinking about cancer risk
3. The ICRP’s more recent methods and models for assessment of internal radiation exposures

Sincerely,

/RA/

Michael T. Ryan
Chairman