



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

Dr. Paul W. Pomeroy, Chairman  
Advisory Committee on Nuclear Waste  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

SUBJECT: HEALTH EFFECTS OF LOW LEVELS OF IONIZING RADIATION

Dear Dr. Pomeroy:

On behalf of Chairman Jackson, I would like to thank you and the members of the Advisory Committee on Nuclear Waste for the interest the committee has expressed regarding the health effects of low levels of ionizing radiation and the validity of the linear non-threshold (LNT) dose-response relationship in the area of low dose and low dose rate exposures. As noted in the committee's letter to Chairman Jackson, the U.S. Nuclear Regulatory Commission (NRC) is funding a three-year grant to the National Council on Radiation Protection and Measurement (NCRP) to review the LNT hypothesis. The objective of this project is to conduct a critical scientific assessment of all biological studies of the effects of exposure to low dose (e.g., 200 mSv) and low dose rate (e.g., 10 mSv h<sup>-1</sup>) ionizing radiation exposure. The results of this review will be published as an NCRP Report entitled, *Critical Evaluation of the Linear No-Threshold Assumption*.

There is considerable divergence of opinion within the scientific community regarding the validity of the LNT hypothesis and its applicability to regulating exposures to ionizing radiation. The assumption of a LNT relationship between accumulated radiation dose and the probability of induced stochastic effect has been regarded as prudent and reasonable for the purpose of radiation protection. However, the LNT hypothesis is considered by many to be unproven and unprovable in human populations at low radiation doses. Consequently, many of the concerns expressed by the ACNW regarding the conduct of the NCRP study have been recognized and addressed by the NRC's Office of Research (RES).

A critical review of the LNT hypothesis must be conducted by an expert, multidisciplinary committee whose scientific views are objective and biases balanced. The NCRP has established a committee of ten national experts (Scientific Committee 1-6) to conduct this assessment. The RES staff has reviewed the membership of Scientific Committee 1-6 and concluded that it is

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an excellent representation from the scientific community. The committee members are a diverse group with scientific expertise in epidemiology, genetics, molecular biology, radiation biology and biophysics, nuclear medicine, radiation oncology, and health physics. Based on the composition of the committee, the RES staff believes the LNT review and assessment will be conducted objectively and that member's biases for or against LNT are balanced.

As indicated previously, the NCRP is tasked to conduct a comprehensive review of the scientific literature relevant to the LNT hypothesis, particularly as it applies to low dose and low dose rate radiation exposures. In addition to committee members conducting an independent literature review, the NCRP has issued a call for scientific data. This call, which was issued to more than 30 scientific journals and other publications, invites the scientific community to provide relevant references and data to the chairman of the committee. In addition, scientists with diverse opinions on the effects of ionizing radiation at low doses will be asked to present their views to the committee at a workshop to be convened early next year. Consequently, the RES staff is satisfied that essentially all studies relevant to LNT will be considered by the committee.

Finally, the RES staff agrees that a critical, comprehensive, independent review of the committee report is needed before the report is released. The NCRP conducts an extensive review of each council report. For example, when the committee completes its' report, the report is reviewed by five or six reviewers (members of the NCRP council or external to the council if additional expertise is required). The committee's report is revised to address each reviewer's comments before it is submitted to the entire council membership and collaborating organizations for review and comment. The National Institute of Standards and Technology, the U.S. NRC and Environmental Protection Agency, the Radiation Research and Health Physics societies, and a variety of medical academies, colleges, and associations are among the fifty-five collaborating organizations which will be provided an opportunity to provide comments. Once comments from the council members and collaborating organizations are addressed by the committee, the report is resubmitted to the entire NCRP council membership for approval. Therefore, the RES staff is satisfied that the LNT report will receive a comprehensive and independent review.

In summary, the RES staff believe that Scientific Committee 1-6 is an excellent representation of the expertise needed to complete this task. All relevant data will be reviewed and incorporated into the NCRP Council Report. This report will receive a comprehensive and critical review by the

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NRC and the other collaborating organizations before it is submitted to the full NCRP council membership for approval. Public release of the report is tentatively scheduled for late summer or early fall 1998.

Sincerely,

James M. Taylor  
Executive Director  
for Operations

cc: Chairman Jackson  
Commissioner Rogers  
Commissioner Dicus  
SECY  
OGC  
OCA  
OPA

P. Pomeroy

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