ACNWS-0123

August 31, 2001

The Honorable Richard A. Meserve
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: SUMMARY REPORT — 128th MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE, JULY 17–19, 2001, AND OTHER RELATED COMMITTEE ACTIVITIES

Dear Chairman Meserve:

The Advisory Committee on Nuclear Waste (ACNW or the Committee) held its 128th meeting on July 17–19, 2001, at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. During that meeting, the Committee approved the following report and discussed several matters:

**REPORT**

- "Review of Chemistry Issues and Related NRC Staff Capability for the Proposed High-Level Waste Repository at Yucca Mountain" (report to the Honorable Richard A. Meserve, Chairman, NRC, from George M. Hornberger, Chairman, ACNW, August 13, 2001).

**HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE**

**I. ACNW Planning and Procedures**

The Committee approved the following topics for discussion during its 129th meeting, scheduled for August 28–30, 2001:

- ACNW Planning and Procedures — The Committee will review items under consideration at this meeting and consider topics proposed for future ACNW meetings.

- Status of Sufficiency Review — The Committee will receive an information briefing from the NRC staff on the status of their sufficiency review of the site recommendation by the U. S. Department of Energy (DOE).

- DOE's Supplemental Science and Performance Analysis (SSPA) — The Committee will hear a status report from DOE on its SSPA.

- Briefing by Margaret Federline, Deputy Director, Office of Nuclear Material Safety and Safeguards (NMSS) — Ms. Federline will address the Committee on items of mutual interest.

- Update on Total System Performance Assessment and Integration (TSPAI) — The Committee will hear a presentation by the NRC staff on the TSPAI technical exchange and management meeting with DOE, held on August 6–9, 2001.

- Research Working Group — The Committee will discuss plans for the subject working group, which is to be held during the 131st ACNW Meeting.

- DOE Yucca Mountain Preclosure Plans — The Committee will hear a briefing by and hold discussions with representatives of DOE on its current preclosure plans and activities for the proposed high-level waste (HLW) repository at Yucca Mountain.

- Preparation for October Visits to Nevada and Utah — The Committee will finalize the topics, agenda, and public outreach sessions for its trip to Nevada, as well as plans for a visit by ACNW members to the Envirocare Facility in Utah prior to the October meeting.

- Proposed ACNW Reports — The Committee will discuss proposed ACNW reports on Yucca Mountain TSPAI, sufficiency comments, research plan for the radionuclide transport prioritization methods, greater-than-class C waste and sealed sources, Yucca Mountain igneous activity analyses, and comments on regulatory conservatism.

## II. Update on Igneous Activity Issue Resolution

Members from NRC and the Center for Nuclear Waste Regulatory Analyses (CNWRA) presented a status report and update on the igneous activity (IA) key technical issue (KTI). The IA KTI comprises both the probability of activity and the consequence(s) of the activity. The NRC has two agreements with DOE related to the probability of occurrence, one of which is closed and the other is closed pending. Presently, the NRC has 12 agreements related to consequences, of which 5 are open. Specifically, these agreements relate to magma-repository interactions and remobilization of contaminated volcanic material.

The NRC will continue to evaluate magma interactions and remobilization to position the staff to review and analyze information submitted by DOE. DOE needs to provide the agreement information and a response to the NRC's proposed agreement items for the consequence subissue. DOE has acknowledged these agreements, and will address them as part of the consolidated response that it plans to submit in the October–November time frame. The speaker expressed concern that the information will likely arrive too late to be factored into DOE's site recommendation, and that it is not clear how this issue will affect the NRC staff's sufficiency review or how it will be resolved.

A member of the CNWRA staff presented more detailed descriptions of two open concerns related to how magma potentially interacts with the repository, and the long-term effects of surface remobilization of contaminated ash and how that can potentially influence risk. The presenter described typical basaltic volcanic eruptions. He discussed simplified 1- and 2-dimensional flow-tube models of magma-drift interactions sponsored by the CNWRA, and ongoing analog studies to validate 1- and 2-dimensional models using acetone and gum

resin to simulate magma and water. The presenter also explained possible ways that magma may flow to the surface, the development of hydrofractures forming as magma rises to the surface, and possible waste package responses.

The key uncertainties related to magma-drift interaction and remobilization in total system performance assessment (TSPA) include the number of waste packages that are damaged and released in extrusive events, the number of waste packages that are wholly or partially damaged in intrusive events, and the potential effects of remobilization.

**Conclusions/Action Items**

The Committee plans to write a letter to the Commission on the subject of igneous activity.

## III. Supplemental Science and Performance Analyses (SSPA) by the U. S. Department of Energy

A representative from DOE presented an introduction to the partially released Supplemental Science and Performance Analyses (SSPA). The general conclusions of the sensitivity analyses are that early waste package failures resulted in very small doses during the regulatory period, doses beyond 10,000 years are less than previous predictions, and peak doses occurred later in time.

**Conclusions/Action Items**

The Committee will hear a detailed technical presentation on the SSPA during its 129th meeting in August 2001.

## IV. Research Plan for the Radionuclide Transport Program

Staff from the Office of Nuclear Regulatory Research (RES) discussed their proposed program plan for research related to radionuclide transport in the environment. The objective of the plan is to support NRC decision-making needs in the areas of decommissioning and nuclear waste disposal facilities. The draft plan contains a comprehensive assessment of currently funded research projects and potential funding projects. RES plans to obtain input from NRC user offices in August 2001, and then publish the proposed plan for external stakeholder review and comment.

**Conclusions/Action Items**

The Committee plans to prepare a report during its August 2001 meeting with comments on the RES methodology for prioritizing its research work. In the near future, in a time frame consistent with what is proposed in the draft RES program plan, the Committee will also provide comments on specific radionuclide transport research that the ACNW believes should be funded by RES.

## V. Key Technical Issues (KTIs) — Vertical Slice Review

George Hornberger, Chairman of the Committee, led a discussion with ACNW members and staff on the elements of a forthcoming letter concerning the staff's sufficiency review of DOE's site recommendation. A partial draft letter on sufficiency was provided as a framework for discussion. Other source material included a template of questions, a list of key issues extracted by Dr. Wymer from the chemistry vertical slice review, and a draft write-up on the TSPA vertical slice review provided by Dr. Garrick. The Committee agreed that it would provide a separate letter on TSPA in addition to the overall letter on sufficiency. After reviewing the main points from his TSPA vertical slice review, and seeking verbal input from members and staff, Dr. Garrick agreed to provide a draft letter for comment before the August 2001 meeting.

The Committee agreed that the sufficiency and TSPA letters should include a series of footnotes or caveats for particular issues that are being addressed for which different results are being obtained in the SSPA.

The Committee and staff discussed the template questions one by one, attempting to provide answers to the questions and identifying where the template needed more information. The members also agreed to provide additional input in their vertical slice areas before the next day. In addition, it was agreed that the sufficiency letter would list and address each of the template questions.

### Conclusions/Action Items

The Committee agreed to have a draft letter ready for the August 2001 meeting, and to finalize both the sufficiency letter and the TSPA letter during that meeting. Ms. Deering, ACNW staff, stated that she would send out a draft for comment, and members would provide input so that the draft would be reasonably complete by the start of the August meeting.

## VI. Greater-Than-Class C (GTCC) Waste

Joel Grimm, DOE/AL Waste Management Division, discussed two DOE activities. His two presentations were entitled "Plans for the Management of Greater-Than-Class C (GTCC) Waste" and "Offsite Recovery Project (OSRP)." He noted that he was the project manager for the latter effort.

After providing a definition of GTCC, per 10 CFR Part 61.55, Mr. Grimm discussed DOE's responsibilities for GTCC, the types of GTCC, and various potential alternative methods for storing and disposing of such wastes. He concluded this first portion of his remarks by noting that DOE has a proactive program to recover and store GTCC waste, but has no plans to store activated metal. The DOE Environmental Management (EM) group continues to engage stakeholders concerning issues associated with GTCC waste.

Mr. Grimm went on to discuss the OSRP scope of work, noting that it has been stated that there are some 18,000 excess and unwanted radioactive sealed sources in circulation. That total includes about 3,550 Am-Be sources, in addition to approximately 1,500 $Pu^{238}$ sources collected this past year. Depending upon the assumptions made, it is speculated that perhaps as many as 12,000 sources have not yet been located. Mr. Grimm quantified the related public health and safety hazard by noting that 3,700 sources have been lost or stolen since 1989. He closed his presentation by discussing the $Pu^{238}$ pacemaker recovery that is currently underway. From December 2000 through May 2001, approximately 1,660 pacemakers have been recovered and stored by DOE.

Members queried Mr. Grimm on several aspects of the DOE program. Of particular interest was when long-term storage and disposal of GTCC waste would be available. Mr. Grimm stated that DOE's position is that long-term disposal of GTCC waste will be available when long-term disposal of HLW is available.

**Conclusions/Action Items**

Mr. Grimm's briefing was for information only, and no Committee action was required. However, the Committee does intend to follow the progress of NRC's regulations regarding licensees' handling, storage, and disposal of GTCC waste.

Sincerely,

**/RA/**

George M. Hornberger
Chairman