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

ACNWS-0146

July 20, 2004

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

SUBJECT: SUMMARY REPORT—151ST MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE, JUNE 22–24, 2004, AND OTHER RELATED COMMITTEE ACTIVITIES

Dear Chairman Diaz:

During its 151st meeting on June 22–24, 2004, the Advisory Committee on Nuclear Waste (ACNW) discussed several matters and completed the following report to Mr. Luis Reyes, Executive Director for Operations, U.S. Nuclear Regulatory Commission (NRC):

"CNWRA Proposed Experimental Program on Spent Nuclear Fuel Dissolution," dated July 6, 2004

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Working Group on Geosphere Transport of Radionuclides at the Proposed Yucca Mountain High-Level Waste Repository

The ACNW hosted a Working Group on the Geosphere Transport of Radionuclides at the proposed high-level waste (HLW) repository at Yucca Mountain, Nevada. Along with the Members, the working group included four expert panelists who commented on the proceedings. These panelists were Don Shettel (representative from the State of Nevada), Richard Parizek (Penn State and Nuclear Waste Technical Review Board member), Ines Triay (U.S. Department of Energy [DOE]), and James Davis (U.S. Geological Survey, Menlo Park, California). Over the course of 2 days, presentations were given by representatives of the NRC staff, DOE, the State of Nevada, Nye County, the Center for Nuclear Waste Regulatory Analyses (CNWRA), and the Electric Power Research Institute (EPRI). Dr. Davis gave the keynote address, "A New Approach to Modeling Retardation by Sorption at the Field Scale." This talk reviewed the development and testing of surface complexation models for transport modeling at the field scale. Dr. Davis concluded that variability in groundwater chemistry may be more important in influencing retardation of strongly adsorbing species than is the variability in surface properties of aquifer materials. A special focus at this meeting was the behavior of neptunium-237, a radionuclide that mildly sorbs to subsurface materials and can contribute to future doses from a repository. It appears that even modest neptunium retardation

in alluvium can delay arrival at the compliance point beyond 10,000 years. Representatives from Nye County, Nevada, talked about the results of recent sonic coring in alluvial materials, their evaluation of current hydrologic conditions, and proposed future groundwater monitoring, the rapid population growth in Nye County, and the cumulative impacts of Federal resource management actions. Nye County seeks long-term, permanent statutory involvement in performance confirmation studies at Yucca Mountain. The Nevada representative noted that DOE's solubility models for neptunium may be realistic but are not conservative. He concluded that assumptions about radionuclide sorption require confirmation.

After the presentations, the expert panelists summarized their views of the meeting presentations. Public comments were received.

Conclusions/Action Items

The Committee will prepare a letter report for this working group and will document the proceedings in a NUREG report.

2. Department of Energy Response (DOE) to NRC's Independent Evaluation of DOE Technical Basis Documents Supporting the DOE's Yucca Mountain License Application

In late 2003 and early 2004, the U.S. Nuclear Regulatory Commission (NRC) staff decided to independently evaluate certain DOE technical documents and supporting activities integral to the development of a Yucca Mountain license application. This "independent technical evaluation" was conducted by the NRC staff and its technical assistance contractor, the Center for Nuclear Waste Regulatory Analyses. It focused on 3 of the 120 analysis model reports (AMRs) that DOE expects to use to support its license application. The staff's independent technical evaluation was not unlike an independent quality assurance (QA) audit. The technical evaluation focused on the process for developing and controlling the AMRs and the effectiveness of past and recent corrective actions in the areas of model development, software development, and data acquisition. At the end of each technical evaluation, DOE was briefed on the results of the audit team's findings.

In a letter dated April 10, 2004, the NRC staff publicly released the results of its technical evaluations. This release was intended to coincide with a technical exchange meeting with DOE on May 5, 2004. In summary, the NRC staff noted that key DOE documents supporting the forthcoming license application needed to be reviewed and clarified. In their April 2004 letter, the NRC staff requested that the DOE respond within 30 days of the May 5, 2004, technical exchange. DOE responded in a letter dated May 28, 2004.

During this meeting the ACNW was briefed on DOE's May 28, 2004, response by Mr. Joseph Ziegler, representing DOE. Overall, Mr. Ziegler noted that DOE agreed with NRC's recent QA concerns and observations. To address these concerns and observations, Mr. Ziegler reported that DOE had brought in about 150 subject matter experts (mostly from the national laboratories) to independently review the technical quality of each of the 120 AMRs. Mr. Ziegler noted that the review activities of this newly created Regulatory Integration Team (RIT) would be subject to a newly created QA corrective action procedure. Mr. Ziegler summarized DOE's post-evaluation review of the NRC QA evaluation and discussed how the new procedure was intended to address the NRC-identified QA concerns. Mr. Ziegler said that the primary focus of the RIT corrective action was to improve human performance in implementing QA, which was determined by the DOE to be the root cause of most of the QA concerns identified. Mr. Ziegler noted that the primary focus of the RIT group would be to review and revise the AMRs, as appropriate, to ensure they are integrated and suitable to support regulatory decisionmaking as part of the forthcoming DOE license application submittal.

Conclusions/Action Items

The ACNW does not anticipate any further action in this area.

3. Preparation for Meeting With the NRC Commissioners

The Committee agreed to transmit the following to the NRC Office of the Secretary as a proposed agenda for the meeting:

1. INTRODUCTION

2. ACNW PRESENTATIONS

A. Opening Remarks
B. Risk Insights Activities
C. ACNW Working Group Sessions
D. Other Committee Activities

- NRC/CNWRA Research
- NMSS Decommissioning Programs (viz., West Valley)

E. Closing Comments

- Proposed Future Activities

4. Reconciliation of ACNW Comments and Recommendations

The Committee considered the following reports from the NRC's Executive Director for Operations (EDO):

- EDO response dated June 10, 2004, to ACNW letter dated May 5, 2004, concerning Review and Evaluation of the U.S. Nuclear Regulatory Commission's Radionuclide Transport Waste Safety Research Program

  The Committee decided that it was satisfied with the EDO's response

- EDO response dated June 15, 2004, to ACNW letter dated May 3, 2004, concerning the ACNW Working Group Session on Biosphere Dose Calculations

  The Committee decided that it was satisfied with the EDO's response.

- EDO response dated June 9, 2004, to ACNW letter dated May 3, 2004, concerning Risk Insight Baseline Report

  The Committee decided that it was satisfied with the EDO's response.

- In its March 4, 2004, letter to the Chairman concerning, "Comments on Selected NRC-Sponsored Technical Assistance Programs of the Center for Nuclear Waste Regulatory Analyses," the ACNW provided comments on selected aspects of the CNWRA programs. EDO response dated April 16, 2004, resolved all but one of the issues addressed by the ACNW in its March 4, 2004 letter.

  The ACNW is working with the staff to resolve ACNW questions related to proposed spent fuel dissolution experiments.

5. Proposed Agenda for the 152nd ACNW Meeting

The Committee agreed to consider the following topics at its 152nd meeting on July 20–22, 2004:

- Package Performance Study (PPS)
- License Termination Rule (LTR) Analysis of the Use of Intentional Mixing of Contaminated Soil
- Risk-Informing Yucca Mountain Inspection System
- August 2004 Japan Trip
- Background Briefing on Integrated Safety Assessment (ISA)

- Health Physics (HP) Issues
- Preparation for, and meeting with, the NRC Commissioners scheduled for July 21, 2004
- Plans for September 24, 2004 Committee Retreat
- Preparation of ACNW Reports on:
  - Geosphere Transport Working Group
  - Treatment of Uncertainties in Hydrologic Models
  - License Termination Rule Analysis of Use of Intentional Mixing of Contaminated Soil
  - Risk-Informing Yucca Mountain Inspection System
  - Package Performance Study
  - As applicable, report on other topics discussed at the 152nd meeting

Sincerely,

/RA/

Michael T. Ryan
Acting Chairman