ACNWS-0124

September 27, 2001

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

Dear Chairman Meserve:

SUBJECT: SUMMARY REPORT — 129th MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE, AUGUST 28–30, 2001, AND OTHER RELATED COMMITTEE ACTIVITIES

The Advisory Committee on Nuclear Waste (ACNW or the Committee) held its 129th meeting on August 28–30, 2001, at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. During that meeting, the Committee discussed several matters and approved one letter report entitled, "Total System Performance Assessment—Site Recommendation (TSPA-SR)," (letter to the Honorable Richard A. Meserve, Chairman, NRC, from George M. Hornberger, Chairman, ACNW, dated September 18, 2001).

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. ACNW Planning and Procedures

The Committee approved the following topics for discussion during its 130th meeting, scheduled for November 27–29, 2001:

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

- **Research Program** — The Committee members will hold a workshop with representatives of the NRC's Office of Nuclear Regulatory Research (RES) and members of the nuclear waste research community to discuss issues associated with regulating nuclear waste and, where applicable, the research and technical assistance needed to address these issues. The workshop discussion will also address techniques for prioritizing regulatory research activities.

- **Commission Meeting Preparation** — The Committee will hold a planning session to prepare for its next meeting with the Commission, which is tentatively scheduled for January 9, 2002.

- **Performance Confirmation** — The Committee will hear a presentation by the NRC staff on its proposed Yucca Mountain Performance Confirmation Plan.

- **Meeting Reports** — The Committee will hear reports from its members and staff on meetings attended since its 129th ACNW meeting.

- **Preparation of ACNW Reports** — The Committee will discuss proposed reports that were not completed at its last meeting.

2. Status of Sufficiency Review

The NRC staff briefed the ACNW on its process for developing preliminary comments on the sufficiency of DOE's supporting information for the site recommendation regarding the proposed Yucca Mountain high-level waste (HLW) repository. The staff also presented the NRC's mandate, the staff's scheduled approach for preparing and risk-informing its preliminary comments, the basis for the staff's comments, and a comparison of the results of the staff's issue resolution to its previous viability assessment comments.

The staff is on schedule for submitting its comments to DOE by November 1, 2001. The *Nuclear Waste Policy Act* mandates that the staff must provide preliminary comments concerning the sufficiency of DOE's at-depth site characterization analysis and waste form proposal for inclusion in any license application for HLW disposal. The staff has interpreted "at-depth site characterization analysis" to mean the evaluation of features, events, and processes below the ground surface. The comments will not include an evaluation of the performance of the site.

The staff will base its preliminary sufficiency review comments on the results of the prelicensing issue resolution activities. Issues remaining open as of August 2001 include the consequences of igneous activity and implementation of DOE's quality assurance program. The staff could open additional issues once it completes its review of DOE's SSPA. Technical exchange meetings scheduled for early September 2001 will include discussion of igneous activity, quality assurance, and the SSPA.

Conclusions/Action Items

The Committee plans to prepare a letter to the Commission on the staff's process to develop its preliminary sufficiency comments.

3. Department of Energy's Supplemental Science and Performance Analysis (SSPA)

Representatives of DOE presented results from the SSPA, which analyzed uncertainties and conservatisms (adding realism) and compared various thermal operating modes of the proposed Yucca Mountain HLW repository. The analysis revealed that the performance of the repository is similar for the high- and the low-temperature operating modes, and that the high-temperature thermal pulse does not significantly affect the engineered or natural barrier systems. Lower radionuclide solubilities and slower corrosion rates in the supplemental total system performance assessment (TSPA) result in peak doses that are an order of magnitude lower at longer times (700,000 years), compared to those documented in the TSPA-SR.

Conclusions/Action Items

None.

4. Update on Total System Performance Assessment and Integration (TSPA&I)

The Committee received an update on the key technical issue (KTI) associated with the Yucca Mountain TSPA&I, presented by James Firth from the NMSS Division of Waste Management (DWM). Mr. Firth leads a Yucca Mountain project team that includes staff from the DWM and the Center for Nuclear Waste Regulatory Analyses (CNWRA). The presentation covered all four KTI subissues, including scenario analysis, multiple barriers, model abstraction, and the overall performance objective. The presentation was timely, in that it covered the agreements reached at the TSPA&I technical exchange and management meeting between the NRC and DOE staffs, which was held in Las Vegas, Nevada, on August 6–9, 2001.

Mr. Firth indicated that the scenario analysis, multiple barriers, and overall performance objective subissues were "closed pending," but that the model abstraction subissue was still "open" because of the outstanding NRC staff questions pertaining to the igneous activity KTI. In addition, Mr. Firth described the process that the staff followed at the technical exchange to reach agreements with DOE, and the basis that the staff used to determine the status of outstanding issues. Specifically, the team's comments to DOE identified several "top issues," including the comprehensiveness of the list of features, events, and processes (FEPs); the approach to multiple barriers; uncertainty in waste package corrosion data; the quantity and chemistry of water contacting the waste package and drip shield; the approach to developing abstractions and parameter value distributions; the stability of performance assessment results; and model validation and computer code verification.

Conclusions/Action Items

The Committee thanked Mr. Firth for an excellent presentation and indicated that the NRC staff should continue its technical communication with the ACNW on the TSPA&I KTI. The Committee prepared a letter to the Commission on DOE's TSPA&I. In addition, the Committee has initiated a review of the dose calculation for a disruptive scenario involving the igneous activity.

5. Briefing by Margaret Federline, Deputy Director of the Office of Nuclear Material Safety and Safeguards (NMSS)

Margaret Federline, Deputy Director, NMSS, briefed the Committee on items of mutual interest. After an introduction in which she discussed some of the background factors that influence current NMSS efforts, Ms. Federline stated that she is striving to find better and more efficient ways to accomplish the objectives of NMSS, while attempting to enhance the working environment.

Ms. Federline's talk focused on five areas, including activities related to Yucca Mountain performance confirmation, the risk task group, decommissioning-related activities, ways to enhance public confidence, and efforts to ensure the availability of critical skills. She also noted that the Tier 1 activities outlined in the ACNW's Action Plan correlated well with the activities of NMSS. She indicated that she intended to maintain a close level of interaction with the ACNW so that, in the future, a similar correlation of activities between NMSS and the ACNW would occur.

In response to a question regarding research areas, Ms. Federline stated that the agency must be sufficiently flexible and capable to accept new science, ideas, and approaches as it fulfills its mandate to protect public health and safety. She noted that there was a significant amount of technical and scientific effort underway in the area of ceramic materials and engineering and, in the future, this may well be an area that enhances the performance of engineered barriers.

Conclusions/Action Items

This was a periodic interchange with NMSS management. No action is necessary except to note the value of continuing these interactions.

6. Department of Energy's Yucca Mountain Preclosure Plans

The Committee heard presentations by and held discussions with representatives of DOE's staff regarding the preclosure plans and activities for the proposed HLW repository at Yucca Mountain. The technical exchange and management meeting in which DOE and the NRC discussed preclosure safety is one in a series of meetings related to the issue resolution and sufficiency review for the proposed repository. The DOE presentation and discussions addressed the following topics within the preclosure safety area:

- development of the license application integrated safety analysis (ISA) process
- description of structures, systems, and components (SSCs), equipment, and operational activities
- identification of hazards and initiating events
- identification of event sequences

- consequence analyses
- identification of SSCs important to safety (SSCISs), safety controls, and measures to ensure availability of safety systems
- design of SSCISs and safety controls
- meeting the 10 CFR Part 20 as low as reasonably achievable (ALARA) requirements for normal operations and category 1 event sequences
- plans for retrieval and alternative storage of radioactive wastes
- plans for permanent closure and decontamination, or decontamination and dismantlement of surface facilities

The DOE representatives stated that the license application for the proposed repository will be for a single design that incorporates the appropriate SSCs and the operations philosophies that will allow safe acceptance, processing, and emplacement of waste. The operational parameters will be bounded and included in the license specifications.

Conclusions/Action Items

This briefing was for information only, and no Committee action is required.

7. Research Working Group

The Committee continued its discussion regarding preparations for the 1½- to 2-day workshop on waste-related research and technical assistance, which will held during the 130th ACNW meeting on November 27–29, 2001. Topics to be addressed include the key anticipated decisions regarding future regulation of nuclear waste, how research and technical assistance can support those decisions, and the prioritization of regulatory research and technical support. The ACNW members will provide Dr. Hornberger and Dr. Savio with suggestions for workshop speakers and panel members.

Dr. Hornberger and Dr. Wymer discussed the highlights of their visit to the CNWRA, noting that the work performed at the Center appears to be of very high quality and focused on important issues. Dr. Savio will provide the ACNW members with a written report describing the highlights of this visit.

Conclusions/Action Items

Preparations for the November 2001 workshop will continue, and Dr. Hornberger and Dr. Savio will coordinate the arrangements with the ACNW members.

Sincerely,

/RA/

George M. Hornberger
Chairman