

July 15, 2002

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

SUBJECT: SUMMARY REPORT — 135TH MEETING OF THE ADVISORY COMMITTEE ON
NUCLEAR WASTE, JUNE 18–20, 2002, AND OTHER RELATED COMMITTEE
ACTIVITIES

Dear Chairman Meserve:

The Advisory Committee on Nuclear Waste (ACNW or the Committee) held its 135th meeting on June 18–20, 2002, at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. During that meeting, the Committee discussed several matters and approved the following reports:

- “FY 2002 and FY 2003 Action Plan for the Advisory Committee on Nuclear Waste” (a letter to the Honorable Richard A. Meserve, Chairman, U. S. Nuclear Regulatory Commission (NRC), from George M. Hornberger, Chairman, ACNW, dated June 27, 2002)
- “Proposed Package Performance Study Test Protocols” (a letter to the Honorable Richard A. Meserve, Chairman, NRC, from George M. Hornberger, Chairman, ACNW, dated June 28, 2002)
- “ACNW Comments on the High-Level Waste Program Risk Insights Initiative” (a letter to the Honorable Richard A. Meserve, Chairman, NRC, from George M. Hornberger, Chairman, ACNW, dated July 2, 2002)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Igneous Activity Considerations at the Proposed High-Level Waste Repository at Yucca Mountain, Nevada

Recently, the U.S. Nuclear Waste Technical Review Board (NWTRB) expressed concerns about conflicts between the models that the U. S. Department of Energy (DOE) and NRC use to assess the consequences of igneous activity in the Yucca Mountain region, and stated their view that the NRC models may be “conservative” in comparison with those used by DOE. The NWTRB’s opinion, published in its *2001–2002 Annual Report to Congress and the Secretary of Energy*, dated April 2002, was founded in large measure

on a November 2001 briefing from three independent consultants¹ whom the NWTRB retained to evaluate the DOE and NRC modeling programs.

The ACNW subsequently invited the NWTRB consultants to attend the Committee's 135th meeting to present their views on the independent modeling work conducted by both the NRC staff and the NRC's technical assistance contractor, the Center for Nuclear Waste Regulatory Analyses (CNWRA). The NWTRB consultants addressed the following areas:

- dike intrusion consequence analyses
- rock mechanics aspects of dike-repository interactions
- shockwave models associated with igneous activity.

To assist in questioning the NWTRB consultants, the ACNW retained its own consultants.²

Committee Action

The ACNW will consider this information in future reports to the Commission on staff efforts in this area.

2. Nuclear Regulatory Commission's Package Performance Study

The Committee heard presentations by and held discussions with representatives of Sandia National Laboratories, the NRC's Office of Nuclear Regulatory Research (RES), and the NRC's Office of Nuclear Material Safety and Safeguards (NMSS) regarding the testing associated with the proposed Package Performance Study Test Protocols. This study is part of the overall program to demonstrate the safety of spent fuel and high-level waste (HLW) shipments and supplements the existing knowledge base on the safety of transporting spent nuclear fuel.

Conclusions/Committee Action

The Committee issued a letter to Chairman Meserve on this matter dated June 28, 2002. The Committee concluded that testing casks to deformation and fuel to failure, when the test conditions significantly exceed realistic accident conditions, provides little benefit in assessing the risk associated with the shipment of spent fuel. The Committee recommended that the study should be designed to provide risk insights; tests to validate codes should be separate from other tests performed to provide safety insights. The study

¹ Drs. Derek Elsworth/Pennsylvania State University, Meghan Morrissey/Colorado School of Mines, and William Melson/Smithsonian Institution.

² Drs. William Hinze/Purdue University and Bruce Marsh/Johns Hopkins University.

should also utilize realistic accident situations, rather than unrealistic and extreme test conditions.

3. Entombment Option for Decommissioning Power Reactors

Dr. Stephanie P. Bush-Goddard from NMSS provided a brief history of the entombment issue. She noted that in response to the Advance Notice of Public Rulemaking, the staff had received 19 comments. However, the comments did not yield a clear consensus as to which of the three proposed options was preferable.

As determined by the responses to the Advance Notice of Public Rulemaking, since the current regulations permit entombment, there is no immediate need for a change at this time. Consequently, the staff is recommending that the Commission defer this rulemaking. The Committee concurred.

Committee Action

The Committee intends to continue following this issue.

4. Long-Term Behavior of Waste Packages

The Committee heard presentations on NRC activities related to the projected performance of waste packages in the proposed HLW repository at Yucca Mountain, Nevada. This included a presentation on analyses of risk related to waste package performance, as well as a presentation on information needs to address potential failure mechanisms from corrosion and other processes and events.

The NRC staff reported on the results of a variety of assessments that they have conducted to evaluate overall repository risk. These analyses provided insights on the relative importance of waste packages and other barriers. The staff also evaluated how the use of excessively conservative models for radionuclide release can be misleading with regard to the most important sources of risk from potential waste package failures.

The staff provided a detailed discussion of the technical issues related to waste package and drip shield performance. These included environmental conditions affecting corrosion, different modes of corrosion (e.g., uniform, localized, and stress corrosion cracking), material aging effects, drip shield performance, possible mechanical failure as a result of falling rocks, possible failures attributable to manufacturing defects, and criticality issues. The staff also discussed the agreements with DOE related to these issues and the information that the staff needs from DOE to complete the agreements.

Conclusions/Committee Action

The Committee will continue following the identified issues because of the importance of the long-term behavior of waste packages to the performance of the proposed Yucca Mountain repository.

5. Yucca Mountain Review Plan, Revision 2

The ACNW discussed the elements of a draft Committee report on Revision 2 of the Yucca Mountain Review Plan (YMRP).

Conclusions/Committee Action

The ACNW expects to issue a report to the Commission on the YMRP in September 2002 after it has had the benefit of public comments and the NRC staff's analyses of the public comments.

6. Reconciliation of ACNW Comments and Recommendations

The Committee discussed the reconciliation of the EDO's response to the ACNW's report dated March 22, 2002, entitled, "Review and Evaluation of the U.S. Nuclear Regulatory Commission's Waste Safety Research Program." The Committee, at this time, agreed that the response was satisfactory, but plans to review progress made on its recommendations as part of the 136th ACNW meeting discussions.

7. Election of Officers

The Committee reelected Dr. George M. Hornberger as Chairman and Dr. Raymond G. Wymer as Vice-Chairman. Their terms will run from July 1, 2002, through June 30, 2003.

Sincerely,

/RA/

George M. Hornberger
Chairman