

May 19, 2003

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

SUBJECT: SUMMARY REPORT—141ST MEETING OF THE ADVISORY COMMITTEE
ON NUCLEAR WASTE, APRIL 22–23, 2003, AND OTHER RELATED
COMMITTEE ACTIVITIES

Dear Chairman Meserve:

The Advisory Committee on Nuclear Waste (ACNW or the Committee) held its 141st meeting on April 22–23, 2003, at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. During that meeting, the Committee discussed the following matters.

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. One Step At a Time: The Staged Development of Geologic Repositories for High-Level Radioactive Waste

Since the mid-1990s, Congress has not fully funded the geologic repository program at Yucca Mountain to levels requested by the U.S. Department of Energy (DOE). As a consequence, DOE has had to delay some milestones and make other program adjustments to conform to fluctuating budget levels. In light of these uncertainties, in 2000, DOE requested that the National Academies provide advice on how the DOE might implement an incremental (staged) approach to the development of a geologic repository at Yucca Mountain. In its 2003 report entitled "One Step at a Time: The Staged Development of Geologic Repositories for High-Level Radioactive Waste," the National Academies proposed a new management approach that relies on "adaptive staging" as a general means to develop any geologic repository for the disposal of spent nuclear fuel and other high-level radioactive waste (HLW). In the Committee's view, these generic findings and recommendations can also be applied to the ongoing Yucca Mountain program. At the invitation of the ACNW, representatives of the National Academies' Board on Radioactive Waste Management (hereafter the "Board") were asked to summarize the findings and recommendations from their recent report.

In its report, the Board observes that the current U.S. approach to the Yucca Mountain program is *linear*, relying on predefined decision-points to project implementation. The Board expressed the view that by their very nature, linear program approaches are error-prone for they typically fail to take full advantage of experience and knowledge acquired through the course of program implementation. As a consequence, when problems arise, they typically are time-consuming and expensive to resolve. In the Board's view, linear approaches may be appropriate for certain types of engineering projects; however, first-of-a-kind projects such as a HLW geologic repository, which face significant technical and societal challenges, are not appropriate candidates.

Alternatively, the Board has recommended an *adaptive [staging] approach* to the implementation of geologic repository programs. As defined by the Board, adaptive staging is a flexible, decision-based process whereby program development milestones are reevaluated (iteratively) throughout the course of the project. This reevaluation is based on programmatic, safety, security, institutional, regulatory, and/or societal factors. The Board's general recommendations concerning adaptive staging for generic repository programs were as follows:

1. Adaptive staging should be the approach used in geologic repository development.
2. A repository program should be based on a structured decisionmaking process that places emphasis on iterative review of safety for the entire repository system.
3. The repository program should make full use of learning opportunities offered by in situ testing.
4. The repository implementer should ensure a continuous and active learning process.
5. The repository program should integrate independent technical advice and stakeholder input to the maximum possible extent.

In regard to the current Yucca Mountain program, the Board had the following specific recommendations for DOE:

1. DOE should adopt adaptive staging.
2. DOE should implement in situ pilot and test activities and should examine the possibilities for demonstration activities.
3. DOE should set up an independent technical oversight group and a stakeholder advisory board.
4. Even if the U.S. program begins with a reduced-scale pilot stage, DOE should present a safety analysis and a safety case based on the full inventory.
5. DOE and the U.S. Nuclear Regulatory Commission staff should work together (without compromising their independence) to ensure that the regulatory process enables the application of adaptive staging in the development of the Yucca Mountain Project.
6. DOE should consider the impact of adaptive staging on the overall waste management system.
7. DOE should continue to promote a safety culture throughout the long duration of the Yucca Mountain Project.

Committee Action

The ACNW staff has informally learned that DOE has no plans at this time to respond to the Board's recommendations. For its part, the ACNW is evaluating the Board's recommendations and will document the Committee's independent views in a letter report to the Commission in the near future.

2. Transportation Working Group Follow-On Session

The Committee conducted a follow-on meeting to the Transportation Working Group (TWG) Meeting held in November 2003 on the transportation of spent nuclear fuel and HLW. During this meeting the TWG received presentations from representatives of the State of Nevada regarding the transportation of spent nuclear fuel to the proposed geological repository at Yucca Mountain, Nevada. In addition, a presentation was made by the National Research Council regarding a study it has initiated on the same subject.

Committee Action

The Committee is evaluating information provided by the State of Nevada and plans to issue a letter to the Commission on this matter in the near future. In addition, the Committee will include this information in a NUREG documenting the proceedings of the TWG November 2003 meeting.

3. Update on NRC Division of Waste Management Activities

The Director, Division of Waste Management (DWM), Office of Nuclear Material Safety and Safeguards (NMSS), presented an update on DWM activities of possible interest to the ACNW as follows:

1. recent NMSS organizational changes
2. feedback process between the ACNW and NMSS
3. the recent staff requirements memorandum (SRM) on the Commission Waste Arena briefing
4. participation by DWM in the July ACNW meeting working group session on performance confirmation
5. the License Termination Rule policy options paper
6. the West Valley Decommissioning Project
7. the International Waste Convention

8. the recent International Conference on Radiation Protection Recommendations and Environmental Protection effort on the Protection of Non-Human Species
9. developments in the International Standards area

Committee Members indicated their interest in continuing these discussions more frequently.

Committee Action

This was an information-only briefing. No action is necessary except to note the value of continuing these interactions.

4. Discussion of Self-Assessment Survey Results

The Committee Members discussed the Advisory Committee on Reactors Safeguards (ACRS) and ACNW draft Commission paper describing the self-assessment of ACRS/ACNW performance for calendar years 2001 and 2002.

Committee Action

The ACNW approved the paper, subject to inclusion of the Members' comments. The paper will be discussed by the ACRS in its next meeting, modified as needed, and issued before May 31, 2003.

5. ACNW Action Plan

The ACNW Action Plan (the Plan) identifies the Committee's mission, vision, desired outcomes, commitments, goals, objectives, and priority topics. In June 2002, the ACNW updated the Plan to reflect new and continuing Committee priorities for fiscal year (FY) 2002 and FY 2003. In issuing its Plan, the Committee stated that it will continue to update it on an annual basis, and track the progress and outcomes of the process improvements.

Beginning with the 139th meeting (December 2002), Committee Members discussed potential updates to the current Action Plan. As a result of these discussions, the Members approved an amended priority topic structure, as well as the reranking of some of the priority topics within the two tiers. The Committee has identified four first-tier priority topics and five second-tier priority topics for FY 2003, as noted below:

First-Tier Topics

1. Risk-Informing the High-Level Waste Licensing Process
 2. Resolution of Key Technical Issues
 3. Performance Confirmation (formerly second tier)
 4. Transportation of Radioactive Waste
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Second-Tier Topics

1. Decommissioning (formerly first tier)
 2. Research
 3. Proposed Private Fuel Storage Facility
 4. Safeguards and Security (new topic area)
 5. Low-Level Radioactive Waste
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Within this amended priority topic structure, and based on recent discussions with NMSS management and staff, Committee Members identified and approved new briefing topics.

In closed session, the Members also discussed the role of the Committee during the NRC review of the DOE license application to construct a geologic repository at Yucca Mountain. The NRC review is currently scheduled to begin in fiscal year 2004.

Committee Action

The ACNW will provide the Commission with a revised Action Plan later this fiscal year to reflect the changes discussed. Separately, the ACNW will provide the Commission with its proposal for the Committee's role in NRC's review of the DOE license application for Yucca Mountain.

6. Election of ACNW Vice Chairman

The ACNW Members elected B. John Garrick as Vice Chairman of the Committee to replace Raymond Wymer who resigned from the Committee on March 31, 2003.

7. **PROPOSED AGENDA FOR THE 142ND ACNW MEETING**

The Committee agreed to consider the following topics at its 142nd meeting on May 28–30, 2003:

- Control of Solid Materials
- License Termination Rule
- Yucca Mountain Review Plan
- 2003–2004 ACNW Research Report
- Proposed ACNW Reports

Sincerely,

/RA/

George M. Hornberger
Chairman