



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555-0001

ACNWS-0109

PDR

November 9, 1999

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

SUBJECT: SUMMARY REPORT—113TH MEETING OF THE ADVISORY COMMITTEE ON
NUCLEAR WASTE, OCTOBER 12–13, 1999, AND OTHER RELATED COMMITTEE
ACTIVITIES

Dear Chairman Meserve:

During its 113th meeting on October 12–13, 1999, at the Alexis Park Hotel, 375 E. Harmon Avenue, Las Vegas, Nevada, the Advisory Committee on Nuclear Waste (ACNW or the Committee) discussed the following issues.

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Round-Table Discussion on the Role of Safety Assessment in the Yucca Mountain Regulatory Process

The Committee held an all-day session on October 12, 1999, to explore the role of safety assessment in the Yucca Mountain regulatory process. The meeting was held to discuss elements of safety assessment and how safety assessment will be used in the Yucca Mountain decisionmaking process, as well as to learn from stakeholders and the public how to communicate safety assessment methods and results so that they can be understood by the general public.

Meeting participants included representatives from the NRC's Division of Waste Management, the Environmental Protection Agency (EPA), the Department of Energy (DOE), the State of Nevada, the Nevada Nuclear Waste Task Force, affected counties, the public, National Congress of American Indians, the ACNW, Sandia National Laboratories, and the Yucca Mountain Study Committee. The format of the meeting consisted of a round-table group discussion, with each party taking the lead on a specific topic. With the help of a facilitator, participants had the opportunity to comment on the various discussion topics noted on the agenda.

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The issues discussed included EPA's proposed high-level waste (HLW) standard; NRC's use of safety assessment to support licensing decisions and the licensing process; the role and management of uncertainty in safety assessments and determining which elements of safety assessment are most important; making the results of safety assessments understandable; analyzing the risk of transporting HLW; why people distrust risk assessment; public outreach for the Waste Isolation Pilot Plant site; the role of the public in risk and safety assessment; and the ACNW's role of advising the NRC on the safety aspects of Yucca Mountain.

The Committee plans to prepare a letter to the Commission conveying its insights gained from the questions, suggestions, and concerns of the public and stakeholders about Yucca Mountain and advising the Commission on opportunities to better involve the stakeholders and the public in NRC's licensing and prelicensing processes.

2. Public Meeting

The ACNW held an evening session with the public and other stakeholders on October 12, 1999, to clarify the role of the ACNW and to listen to the concerns and perspectives of the public and other stakeholders on the proposed repository.

Conclusions/Actions

On the basis of the input received during the evening meeting session and the day-long round-table discussion, the Committee plans to prepare a letter to the Commission conveying its insights gained from the questions, suggestions, and concerns of the public and the stakeholders about Yucca Mountain and advising the Commission on opportunities to better involve the stakeholders and the public in NRC's licensing and prelicensing processes.

3. Drilling Program of Nye County, Nevada

After presenting an overview of the Nye County early warning drilling program (EWDP), Nick Stellevato, Project Manager, Nye County, Nevada, introduced Tom Buqo, Nye County consulting hydrologist, who discussed Nye County's drilling program in greater detail.

Mr. Buqo discussed the results obtained to date and Nye County's Phase 2 plans, which were as follows:

1. Deepening NC-EWDP-3D
2. Conducting a long-term, higher discharge aquifer test at the Jackass Aeropark well
3. Changing NC-EWDP-12S from a monitoring well to a test well
4. Investigating spring deposits, aquifers, and water levels in Crater Flat at NC-EWDP-7S
5. Performing additional deep and intermediate drilling

In response to a question, the Nye County representatives stated that in terms of the importance of the Nye County drilling program to the proposed repository at Yucca Mountain, in addition to its being important to know where the receptors were located, the current modeling capability was unable to make meaningful predictions without the collection of additional data.

Conclusions/Actions

The Committee stated that it would continue to be interested in hearing periodic reports on the NC-EWDP. The Committee proposed that consideration be given to controlled archiving of samples taken from the wells.

4. Presentation by Clark County, Nevada

Englebrecht von Teisenhausen, Clark County, Nevada, observed that since the draft environmental impact statement (DEIS) for Yucca Mountain uses the total system performance assessment (TSPA) models for long-term performance, comments on the viability assessment (VA) are still useful in reviewing the DEIS.

Fred Dilger, Nye County, commented on transportation issues. His review covered his perspective of transportation risk and impacts. He closed his formal comments by noting the following major concerns of Nye County:

1. The DEIS does not identify the most likely highway or rail routes through the U.S.
2. The DEIS does not provide the printouts that contain the analysis (RADTRAN, HIGHWAY, INTERLINE, et al.)
3. The DEIS does not provide a basis for mitigation negotiations

James Williams, a citizen of Nye County, Nevada, stated that the DEIS does not recognize that there is going to be a major transfer of nuclear material from a group of sites around the country to one rural Nevada county. Among several suggested issues he considered relevant were that the DEIS does not adequately consider the impact of the Nevada test site on the cumulative risks to which Nye County would be subjected or the impact of politically powerful counties on the routing of the shipments.

Several other attendees at this public meeting also presented their views.

Conclusions/Actions

The Committee expressed chagrin that a satisfactory transportation risk assessment had not yet been completed, although it recognized that Yucca Mountain has not yet been determined to be a satisfactory site for an HLW repository.

5. Department of Energy Process Model Reports

This briefing updated DOE's development plans for process model reports (PMRs) that will provide the supporting technical basis in the TSPA, the site recommendation (SR), and the license application (LA) for the Yucca Mountain HLW Repository. There will be nine PMRs: (1) Integrated Site Model, (2) Unsaturated Zone Flow and Transport Model, (3) Saturated Zone Flow and Transport Model, (4) Near-Field Environment, (5) Waste Package Degradation, (6) Waste Form Degradation, (7) Engineered Barrier System Degradation and Flow/Transport Model, (8) Biosphere, and (9) Tectonics. These PMRs will compile all the necessary technical information for the TSPA related to each of the nine topical areas, including technical issues, the conceptual basis and assumptions, models and codes, verification of quality assurance status for the codes, data supporting the models, model validation, and abstraction of models into the TSPA framework. Each PMR will be supported by analysis and modeling reports that, in turn, will be based on data sets and modeling inputs. Most of the Revision 0 PMRs will come out in the first 6 months of calendar year 2000.

Conclusions/Actions

This briefing was held to develop background information for the Committee's review activities related to the DEIS, the SR, and the LA, and no action is anticipated at this time.

6. Earthquake Hazards and Public Perception

A representative from DOE's management and operation (M&O) contractor briefed the ACNW on the basic elements and approach used to conduct DOE's probabilistic seismic hazard analysis (PSHA) and discussed approaches to address public perceptions of earthquake hazards. The speaker also discussed aspects of two recent earthquakes in the Yucca Mountain vicinity: Little Skull Mountain and Scotty's Junction. K. Coppersmith, Geomatrix, reviewed some misconceptions about earthquakes, including the misperception that earthquakes are always a surprise. He noted that it is very unusual for individual events to affect hazard estimates, especially in well-studied areas.

Earthquake events provide an opportunity to learn, are important to empirical and theoretical source models, and provide an incremental gain in knowledge. Both the Little Skull Mountain and the Scotty's Junction earthquakes were moderate, occurred in zones identified as seismic source zones, did not exceed maximum earthquake magnitude (M_{max}) estimates, and had a small possibility of recurring. The speaker concluded by indicating that because public interest in and concern about earthquakes are high, greater effort should be made to show the value of each event in increasing our incremental knowledge. The ACNW asked the speaker about his recommendations on how to communicate information about earthquake risk to the public. He acknowledged this task as a challenge and suggested that jargon and acronyms be avoided and that an attempt be made to reach out to more people.

Conclusions/Actions

The ACNW will continue to explore the subject of risk communication and public perception.

7. Department of Energy's Work Reprioritization

Paul Harrington, DOE, presented an update on the revised DOE repository design. He discussed the status of the modified Enhanced Design Alternative (EDA) II, which has been accepted by DOE. He described the main features of the EDA-II compared with the viability assessment design. He described the design and development testing that is being conducted to provide input on the EDA-II for the site recommendation and the license application. He also compared the projected performance of EDA-II with the other proposed EDA designs. He noted that DOE has confirmed its acceptance of the EDA-II design in its response to the Nuclear Waste Technical Review Board letter of July 9, 1999, on design issues.

Mike Vogele, M&O contractor, discussed the prioritization of the development of work that is needed for the TSPA for the SR (TSPA-SR). He described how DOE is revising its repository safety strategy (RSS) for the postclosure safety case and is updating the 19 principal factors that were a key element of the RSS for the VA. DOE conducted a series of workshops to prioritize the new factors in the updated safety case. DOE considered results from the TSPA, barrier importance assessments, design margin and defense in depth, uncertainties, model limitations, and the degree of "confidence" needed for an adequate safety case. For the new EDA-II design, the most important principal factors for performance are seepage, drip shield performance, waste package performance, radionuclide solubility, radionuclide retardation in the unsaturated and saturated zones, and dilution of radionuclides. The M&O contractor has identified additional testing and analyses to support TSPA-SR. He stated that DOE is continuing to use TSPA, sensitivity studies, importance analyses, and expert judgment to refine its safety case.

Conclusions/Actions

The Committee will continue to follow these activities related to the SR and the LA.

8. Status of the Department of Energy's Yucca Mountain Project

Mark Peters and John Stuckless, M&O contractor, presented a detailed and comprehensive update to the Committee on activities that have occurred at the Yucca Mountain site since the Committee's last visit. The presentation by Dr. Peters also gave an extensive overview of the areas that the Committee would visit during its tour of the exploratory studies facility, which was scheduled for the next day. He outlined specific potential areas of interest at each of the stops scheduled for the underground tour.

Dr. Stuckless then discussed many of the natural analog sites that he has visited in Europe, Africa, India, Israel, and Turkey. He made his investigative trips to find (and better understand) natural analogs that show that moisture would go around the tunnels. As an example of his

diligence, he personally visited more than 100 sites in France and Spain alone. He noted that the French have begun a technical study to determine why the ancient paintings in many of the caves (in some cases, tens of thousands of years old) have not deteriorated.

Conclusions/Actions

The Committee expressed its thanks to both presenters.

9. Yucca Mountain Tour and Visit to the Department of Energy's Atlas Research Facility at Losee Road

The Committee, its consultant Milton Levenson, and the ACNW staff visited several areas at the Yucca Mountain site. In addition to DOE and M&O contractor guides, the group was accompanied by representatives from both Nye and Clark Counties, the State of Nevada, the Nevada Nuclear Waste Task Force, and the Nuclear Energy Institute.

The group observed the activities in Alcove 8 in the cross-drift, Niche 1, and Alcoves 5, 4, and 1 (in that order). Following the tour, the Committee proceeded to the Busted Butte underground research facility. Because of work in the area, access to the experimental area was limited to only the ACNW members and staff.

The group then departed for the DOE Atlas research facility located on Losee Road, North Las Vegas. At Atlas, the Committee was able to observe the performance testing of several of the various Engineered Barrier System (EBS) concepts. Testing was being conducted at both ambient and elevated temperatures over a wide range of water infiltration values. Among the EBS concepts discussed was the use of "getters," backfill, drip shields, and the Richards Barrier.

Conclusions/Actions

The Committee found the visit to Yucca Mountain of value and intends to continue to periodically visit the site as progress is made. It also indicated a desire to further follow the testing at the Atlas facility, particularly as the results become available.

PROPOSED SCHEDULE FOR THE 114th ACNW MEETING

The Committee agreed to consider the following issues at its 114th meeting on November 17-19, 1999:

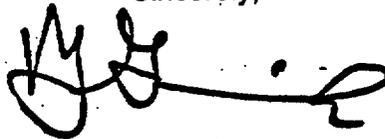
- **ACNW Planning and Procedures** — The Committee will hear a briefing from its staff on issues to be covered during this meeting. The Committee will also consider topics proposed for future consideration by the full Committee and Working Groups. These topics will include strategic planning and self-assessment, as well as topics for the next Commission briefing. The Committee will discuss ACNW-related activities of individual members. The Committee may also discuss potential ACNW members.

- **Department of Energy's Yucca Mountain Draft Environmental Impact Statement** — The Committee will discuss with the NRC staff the staff's review of the DEIS. The Committee plans to submit a letter report on this topic.
- **NRC's Yucca Mountain Specific High-Level Waste Regulation** — The Committee will review the latest version of 10 CFR Part 63, "Disposal of High-Level Radioactive Wastes in a Proposed Geologic Repository at Yucca Mountain, Nevada." The Committee will also explore the tenor of the public comments.
- **Rubblization** — The Committee will review this decommissioning option and prepare comments on the concept.
- **Annotated Outline for Yucca Mountain Review Plan** — The Committee will hear a briefing from the NRC staff describing the transition from Issue Resolution Status Reports to a Yucca Mountain review plan.
- **Research Plan for Environmental Transport** — The ACNW will review generic codes used to predict radionuclide transport in the geosphere. The Committee intends to submit comments on this review.
- **Meeting With Office of Nuclear Material Safety and Safeguards Managers** — The Committee will meet with NMSS managers to discuss items of mutual interest.
- **Preparation of ACNW Reports** — The Committee will discuss planned reports, including reports on a White Paper on Near-Field Chemistry Issues, a joint ACRS/ACNW letter report on an NMSS approach to risk-informed, performance-based regulation in NMSS, the Yucca Mountain DEIS, NRC's Yucca Mountain specific HLW disposal regulation, the rubblization decommissioning option, waste-related research, and other topics discussed during this and previous meetings.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

The 115th ACNW meeting is scheduled for December 14–16, 1999, in Rockville, Maryland.

Sincerely,

A handwritten signature in black ink, appearing to read "B. John Garrick". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

B. John Garrick
Chairman