



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

ACNWS-0141

November 13, 2003

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

SUBJECT: SUMMARY REPORT—146<sup>TH</sup> MEETING OF THE ADVISORY COMMITTEE  
ON NUCLEAR WASTE, OCTOBER 21–23, 2003, AND OTHER RELATED  
COMMITTEE ACTIVITIES

Dear Chairman Diaz:

The Advisory Committee on Nuclear Waste (ACNW or the Committee) held its 146<sup>th</sup> meeting on October 21–23, 2003, at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. During this meeting, the Committee discussed the following matters.

**HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE**

**1. Summer Intern Report**

The ACNW summer intern, Tina Ghosh, presented her near-final report titled, "Risk-Informed Uncertainty Studies for the Yucca Mountain Repository Program." Ms. Ghosh, a Massachusetts Institute of Technology doctoral candidate, received several comments and questions from the Members during this presentation, which is directly related to her doctoral dissertation.

**Committee Action**

None. This briefing was for information only.

**2. Biosphere Scenarios and Dose Calculation Working Group Session**

Dr. Michael Ryan, ACNW Member, reported that initial coordination of the draft prospectus and agenda for the February 2004 Biosphere Working Group session on biosphere scenarios and dose calculation had been completed with the NRC staff. The prospectus and agenda would now be given to the Department of Energy (DOE) staff, interested stakeholders, and a panel of invited experts for comment.

The following individuals had been selected as panelists for the Working Group session:

Dr. Dade Moeller (Keynote Speaker)	Chairman of the Board Dade Moeller and Associates
Dr. Keith Eckerman	Earth Sciences Division Oak Ridge National Laboratory
Dr. Jeffrey Daniels	Environmental Sciences Division Lawrence Livermore National Laboratory
Dr. Michael Thorne <sup>1</sup>	Principal Mike Thorne and Associates (UK)
Dr. John Till	President Risk Assessment Corporation
Dr. Ward Whicker	Department of Radiological Health Sciences Colorado State University

### **Committee Action**

None at this time. The Biosphere Working Group session is scheduled to be held during the 149<sup>th</sup> ACNW meeting, February 24–27, 2004.

### **3. Site Visit to Yucca Mountain and Amargosa Valley, Nevada**

The Committee reviewed the status of planning activities for the November 18, 2003, underground tour of the Yucca Mountain repository site and bus tour of the nearby community of Amargosa Valley. The underground tour planned for the morning will focus on reviewing geologic features at the site that might have a bearing on repository design and performance issues in the area of rock mechanics and underground excavation stability. The underground tour will be conducted by Dr. Mark Board, a DOE contractor. In the afternoon, the Committee will take a bus tour of the Amargosa Valley rural farming area to the south of the potential geologic repository. The tour is intended to contribute to the Members' knowledge base for the February 2004 ACNW Working Group session on biosphere scenarios and dose calculation. Mr. Ralph McCracken, a long-time farmer in the area, will conduct the tour. Stakeholder representatives will accompany the Committee on both tours.

On November 19–20, 2003, the ACNW plans to hold its 147<sup>th</sup> meeting at the Texas Station Hotel and Casino in North Las Vegas, Nevada. The focus of the 147<sup>th</sup> Committee meeting will be technical matters related to the development of a geologic repository at Yucca Mountain. Presentations are expected from representatives of DOE, Inyo

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<sup>1</sup>Representing the State of Nevada.

County (California), Nye County (Nevada), the Electric Power Research Institute (EPRI), and other interested stakeholders.

#### **Committee Action**

None at this time. Plans for a visit to Yucca Mountain and 147<sup>th</sup> ACNW meeting agenda are completed.

#### **4. Committee Retreat**

During this meeting, the Committee defined a list of potential technical topics (including focused working groups) that it intends to examine over the next 12 to 18 months. Two outside speakers spoke to the Members as part of the retreat deliberations.<sup>2</sup> As a result of the discussions and deliberations, a working list of briefing topics was developed for the potential ACNW reviews. Also at this meeting, it was decided that Members John Garrick and Michael Ryan would meet with individual Commissioners, the Deputy Executive Director for Operations for Materials Research and State Programs, and with Office of Nuclear Materials Safety and Safeguards (NMSS) management in the near future to better define the areas for future ACNW technical reviews.

#### **Committee Action**

Members Garrick and Ryan tentatively scheduled January 2004 for conducting their suite of Commission and NRC management meetings. ACNW staff will finalize the working list of potential technical topics into a meeting calendar for the 2004 year.

#### **5. Yucca Mountain Preclosure Safety and Drift Degradation Issues**

Representatives from the NRC staff and the Center for Nuclear Waste Regulatory Analyses (CNWRA) briefed the ACNW on the preclosure safety analysis (PCSA) methodology and the drift degradation analysis. The staff believes the PCSA tool provides additional capability to gain risk insights through an integrated safety analysis. The tool aggregates risk to a member of the public from the entire facility. The tool identifies the total risk, the largest contributors to the total risk, and the most likely outcomes for combinations of events.

The DOE and NRC staffs' views appear similar regarding dynamic impact of blocks of rock on the drip shield and the occurrence of drift degradation and accumulated rubble within 10,000 years. The two staffs' views differ on (1) the magnitude of drip shield loading from accumulated rubble, (2) rates of drift degradation, and (3) representation of drift degradation in the performance assessment. Preliminary results from the NRC staff's analysis indicate that 75 percent of the drip shields buckle under static rock fall loads within 500 years after cessation of maintenance of ground support systems.

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<sup>2</sup>Dr. Kevin Crowley, Staff Director of the National Academies Board on Radioactive Waste Management, and Ms. Margaret Federline, Deputy Director, Office of Nuclear Material Safety and Safeguards.

**Committee Action**

The ACNW is currently planning to offer advice to the Commission on the preclosure safety analysis tool and drift degradation analysis. Preparation of the reports is expected to begin in November 2003. The Committee will be briefed by DOE representatives at the November 2003 ACNW meeting to understand their analysis of drift degradation.

**6. Updated Staff Performance Assessment Code TPA 5.0 and Peer Review Comments**

NMSS/DWM staff briefed the Committee on recent improvements to NRC's total-system performance assessment (TPA) computer code, including revisions made in response to an NRC-sponsored peer review of that computer code. In 1997, the ACNW recommended that the NRC staff seek a peer review of its TPA computer code. In 1998, NRC directed its technical assistance contractor, CNWRA, to undertake an external peer review of its TPA computer code (Version 3.2 at the time) as well as the overall NRC TPA methodology. In 2000, the ACNW Members received a briefing on the external peer review results which resulted in additional Committee comments on this issue.

In summary, the peer review group provided 233 individual comments and recommendations for the NRC staff to consider. Peer review comments applied to specific areas of the TPA code, as well as to the overall performance assessment process. The peer review group comments and recommendations are summarized as follows:

- NRC's TPA computer code is well developed and captures important physical processes associated with repository behavior.
- NRC's TPA computer code would be sufficient in technical quality and flexibility for reviewing DOE's license application.
- Specific improvements were necessary to enhance the use of the code.

In parallel to the peer review process, the NRC staff has continued to make enhancements to the TPA computer code. Revisions made in fiscal year 2001 (Version 4.1) reflect some of the peer review group comments and recommendations generally cited above. The staff intends to make additional enhancements for Version 5.0 of the code, the version to be used to review DOE's license application (now under development).

**Committee Action**

None. These briefings and discussions were intended for information only.

**7. Waste-Management-Related Safety Research Report**

The Committee discussed a plan for its annual review of the NRC-sponsored research and technical assistance program and agreed to a scope of work. Dr. Ruth Weiner, ACNW Member, will continue to work on this project.

**Committee Action**

Dr. Weiner will provide additional recommendations to the Committee following the visit of ACNW staff and a consultant to the CNWRA on November 18–20, 2003.

**8. Update on Waste Management Topics**

The Director, DWM, NMSS, provided an update to the Committee on waste management activities relevant to the Committee charter. His presentation included both high- and low-level waste topics which should be considered by the Committee as it refines its fiscal year 2004 agenda.

**Committee Action**

This information will be considered by the Committee as it develops its meeting calendar for 2004.

**9. Preparation for Meeting With the NRC Commissioners**

The Committee discussed its presentation for the October 23, 2003, public meeting with the NRC Commissioners. Topics proposed for discussion included the following:

**Chairman's Report**

- ACNW Priorities and Future Review Plans
- Working Groups (Past and Future)
- Public Outreach Initiatives
- ACNW Role in the Yucca Mountain License Application

**Presentations**

- Status and Pathway to Closure on Key Technical Issues
- High-Level Waste Risk Insights
- TSPA/TPA Working Group
- Performance Confirmation Working Group

**Committee Action**

None. Members approved draft viewgraphs, subject to editing.

10. **Proposed Agenda for the 147<sup>th</sup> ACNW MEETING**

The Committee agreed to consider the following topics at its 147<sup>th</sup> meeting, which will be held in Nevada, on November 19–20, 2003:

- DOE overview on the Yucca Mountain program status and on repository design status
- DOE approach to drift degradation analyses
- Interactions with stakeholders (representatives from affected units of local government and Native American groups have been invited)
- Yucca Mountain igneous activity status
- Inyo County carbonate drilling program status
- Nye County early warning drilling program status
- Report on EPRI Workshop on Natural Analogues
- Views of affected units of local government
- Preparation of ACNW reports

Sincerely,

**/RA/**

B. John Garrick  
Chairman