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

April 4, 2000

The Honorable Richard A. Meserve
REC'D BY Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
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SUBJECT: SUMMARY REPORT — 117TH MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE, FEBRUARY 23–25, 2000, AND OTHER RELATED COMMITTEE ACTIVITIES

Dear Chairman Meserve:

During its 117th meeting on February 23–25, 2000, at the Arnold and Mabel Beckman Center of the National Academies, Room IID, Irvine, California, the Advisory Committee on Nuclear Waste (ACNW or the Committee) discussed several matters and approved the following report:

"Regulatory Approaches for Control of Solid Materials (Clearance Rule)" (Report to The Honorable Richard A. Meserve, Chairman, NRC, from B. John Garrick, Chairman, ACNW, March 21, 2000)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Planning and Procedures

The ACNW approved issues to be considered during the 118th ACNW meeting, March 27–29, 2000, to be held in Rockville, Maryland. This meeting will be held a day earlier than originally planned. Topics will include the following:

- Preparation of ACNW reports on NRC's 10 CFR Part 63, defense in depth, the ACNW Action Plan and self-evaluation.
- An overview of NRC's Spent Fuel Projects Office, with an emphasis on transportation of spent fuel and high-level waste (HLW).
- An introduction to the NRC staff's strategy for site sufficiency comments on a possible Yucca Mountain site recommendation by the Department of Energy (DOE).
- A progress report by the NRC staff on the development of a Yucca Mountain Review Plan.

- A review by the Committee of two research projects: one dealing with uranium plume attenuation and the other on the radionuclide content of slag.

- A current events discussion by the NRC's Director of the Division of Waste Management (DWM), Office of Nuclear Material Safety and Safeguards (NMSS).

The ACNW does not plan to hold a meeting in April 2000. The dates for the 119th and 120th ACNW meetings were changed to June 13-15, 2000, and July 25-27, 2000, respectively.

2. **A Discussion of Probability, "An Introduction to Bayes Theorem and the 'Evidence Based' Approach to Risk and Decision Analysis"**

Stan Kaplan, international expert on probabilistic risk assessment, began his presentation by giving a precise definition of probability, which he called "credibility," and using that definition to derive Bayes' theorem, which he related to the fundamental principles of logic. Bayes' theorem provides a means for improving probability estimates based on the gathering of additional evidence.

Dr. Kaplan discussed the types of evidence used in risk and decision analyses and described a decision analysis framework based on the Bayesian updating of utility functions on the basis of costs, benefit, and damage. He finished his presentation with a discussion of several hypothetical theories and case studies that showed how increasing the evidence in a decisionmaking process, using Bayesian techniques, can lead to selecting different options from those that a user would select with less evidence. His examples also demonstrated how uncertainty in decisionmaking decreases with increasing amounts of evidence.

3. **Self-Assessment**

The ACNW discussed the self-assessment for Fiscal Year (FY) 1999 in terms of what ACNW planned to do, what it accomplished, and how effective it was. The ACNW staff noted that the self-assessment would be streamlined this year and combined with the Advisory Committee on Reactor Safeguards' (ACRS) report and would include the matrix summarizing the Committee's FY 1999 letters and outcomes. The ACNW staff led the Committee members through a discussion on the draft matrix, which was followed by the Committee's voting to approve the matrix to preclude any ambiguities and delegated the ACRS/ACNW Executive Director authority to interpret Committee comments and recommendations.

The ACNW staff and management summarized the results of an ACNW stakeholder survey and direct feedback received from the Commissioners. Most of the stakeholder comments were generally positive.

Conclusions/Action Items

An ACNW staff member will prepare a draft of the document for the Committee's review and will include the matrix approved by the Committee.

4. **Briefing by Managers From the Office of Nuclear Material Safety and Safeguards**

[Note: This briefing was held by way of video teleconferencing.]

Martin J. Virgilio, Deputy Director of NMSS, summarized NMSS priorities for the Committee. He stated that in FY 2001, NMSS will be reduced by 6 percent. He further stated that NMSS cannot add activities unless existing activities are dropped and replaced by new activities. He emphasized that NMSS will be concentrating its efforts on Yucca Mountain HLW activities, which include 10 CFR Part 63, the Yucca Mountain Review Plan, site recommendation comments, and DOE siting guidelines (10 CFR Part 963). He stated that the Branch Technical Position on Low Level Waste Performance Assessment is due to the Commission on September 30, 2000. NMSS is also concentrating its efforts in the areas of decommissioning and license termination rule guidance. The Spent Fuel Projects Office will be reviewing issues related to transportation and updating the modal study.

Conclusions/Action Items

The Committee will stay abreast of and coordinate, to the extent practicable, the activities of NMSS.

5. **Briefing by a Representative of the Nuclear Waste Technical Review Board on Board's Letter Writing Process**

Michael Carroll, Nuclear Waste Technical Review Board (NWTRB or the Board), gave a brief report on the process used by the Board for report and letter writing, use of consultants, and strategic planning for FY 2000. He noted that the NWTRB is required to produce two official reports a year: the annual performance report and an annual strategic plan. In addition, the Board produces special reports, special letters, and meeting letters. A draft outline for each meeting letter is prepared at a business meeting the day after the Board's public meeting. Further refinements are performed by e-mail.

In its strategic plan, the Board identified four main goals: waste management, site characterization, licensing, and performance confirmation. Priority activities and strategies are identified under these goals, and this information is contained in the summary report and transmitted to Congress. Regarding the use of consultants, the Board augments its expertise in areas that have included modeling uncertainty, fluid inclusions, transportation, and sabotage. Priority areas this year include the DOE's site recommendation and transportation.

6. **Selection of First- and Second-Tier ACNW Priority Issues**

The Committee selected first- and second-tier priority issues for its 2000 Action Plan. First-tier issues include the Yucca Mountain site recommendation and license application, risk-informed, performance-based regulations for the NRC, decommissioning issues, the Yucca Mountain Review Plan being prepared by the NRC staff, and issues associated with the

transportation of spent fuel and nuclear waste. Second-tier priority issues include the NRC's waste-related research; a review of low-level waste (LLW) and Agreement State issues; and a review of efforts toward risk harmonization, within and across NRC programs, as well as across agencies.

Conclusions/Action Items

The Committee intends to issue its 2000 Action Plan in early April 2000.

7. **Process Improvement/Operations Issues**

The Committee discussed process improvement issues. For the most part, the conduct of Committee business is satisfactory.

8. **Succession Planning for ACNW Members**

The Committee discussed succession planning for its members. It was suggested that potential members serve as consultants or as individuals under contract to the ACNW. By serving as consultants or under contract, individuals with needed expertise and experience needed by the ACNW, would become familiar with ACNW operations and create a potential pool of candidates for new members.

9. **Future Committee Activities**

The Committee discussed the following candidate topics for future working group meetings:

1. Transportation issues
2. Decommissioning topics
3. NRC's waste-related research and technical assistance
4. NRC's HLW issues resolution process
5. DOE's performance confirmation program

Several of these topics will be scheduled for an entire day of review by the ACNW, as resources allow.

10. **A Discussion of Topics Related To Recycling of Slightly Contaminated Materials and Nonproliferation Concerns**

Thomas Sanders, Sandia National Laboratories, an invited guest speaker, briefed the Committee on the next nuclear era. His presentation covered a variety of subjects such as general nuclear material issues related to global nuclear materials management, legacy

materials destined for a repository, and metal recycling. He stated that the worldwide nuclear power infrastructure will rapidly change over the next three decades. Former defense infrastructures in several countries will be transitioned to civilian use. The excess defense materials could be irreversibly consumed by civilian reactors. Many more developing countries will invest in the nuclear option for energy independence.

He briefly described contaminated metal recycling technology. This technology has the potential to dramatically reduce the amount of material that must be disposed of as LLW. Collaborative efforts to study this technology are in progress between Sandia National Laboratories and institutes in both Russia and the Ukraine. He concluded that ACNW is well positioned to help the Commission with a number of issues associated with the transition to the "next nuclear era."

Sincerely,

B. John Garrick
Chairman