ACNWS-0113

April 27, 2000

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

SUBJECT: SUMMARY REPORT—118TH MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE, MARCH 27–29, 2000, AND OTHER RELATED COMMITTEE ACTIVITIES

Dear Chairman Meserve:

During its 118th meeting on March 27–29, 2000, at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland, the Advisory Committee on Nuclear Waste (ACNW or the Committee) discussed several matters and approved the following reports:

- "Comments and Recommendations on the Draft Final Rule, 10 CFR Part 63, "Disposal of High-Level Radioactive Waste in a Proposed Geologic Repository at Yucca Mountain, Nevada" (Report to The Honorable Richard A. Meserve, Chairman, NRC, from B. John Garrick, Chairman, ACNW, March 31, 2000)

- "Advisory Committee on Nuclear Waste 2000 Action Plan and Priority Issues" (Report to The Honorable Richard A. Meserve, Chairman, NRC, from B. John Garrick, Chairman, ACNW, April 18, 2000)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Activities of NRC's Spent Fuel Project Office

The ACNW heard a status report on activities underway in the Spent Fuel Project Office. The discussion focused on spent fuel storage, licensing storage and dual-purpose casks, and transportation of spent fuel and high-level waste (HLW). In addition to the presentation by the NRC staff, the Committee heard presentations by representatives of the Department of Transportation, Edlow International, and Public Citizen, Critical Mass Energy Project.

Conclusions/Action Items

The ACNW has ranked transportation as a high-priority item because of public concern about this issue. A future workshop and a report to the Commission on the transportation of spent fuel and HLW are planned.

2. NRC Strategy for Site Sufficiency

The NRC staff briefed the ACNW on its proposed strategy to review the Department of Energy's (DOE's) Site Recommendation Considerations Report and to prepare sufficiency comments. The Nuclear Waste Policy Act requires DOE to include the NRC's sufficiency comments in a site suitability recommendation to the President.

The staff discussed the purpose of its review and its scope, objectives, documentation of results, schedule, integration of the strategy with other ongoing staff activities, proposed interactions with the ACNW, and proposed stakeholder involvement.

The purpose of the staff's review is to evaluate whether DOE has enough data and conceptual understanding of the repository system to develop a safety case for the license application (LA). The staff's documented review will serve as a progress report on DOE's sufficiency of data, design, analyses, and plans for the LA. The NRC staff will evaluate sufficiency in the context of the NRC's performance-based approach to licensing implemented in draft 10 CFR Part 63. The staff's review is fully integrated into the NRC's licensing strategy outlined in guidance being developed and the key technical issue resolution process. The staff will not remark on DOE's dose estimate, nor will it review the document against DOE's proposed siting guidelines in 10 CFR Part 963. The staff will provide the strategy for its sufficiency review to the Commission by June 30, 2000.

Statements were made by representatives from the Nuclear Energy Institute (NEI) and from the Public Citizen Critical Mass Energy Project. The NEI representative noted that the case to move ahead with Yucca Mountain is compelling on the basis of existing information, noting that DOE, the NRC, and the Electric Power Research Institute analyses of the draft environmental impact statement (DEIS) are all in agreement. He pointed out that the NRC's sufficiency review is a decision on DOE's ability to docket a license application and on whether the four-stage licensing process can begin. He also noted that the NRC's DEIS comments were disappointing because the NRC did not indicate the areas that it found acceptable.

The representative from Public Citizen remarked that the decision to move ahead with the Yucca Mountain project is not urgent. She stated that some 200 entities signed a petition for DOE to disqualify Yucca Mountain on the basis of DOE's existing siting guidelines in 10 CFR Part 960. She noted that a large segment of the American public has found the DEIS to be unacceptable. She also noted that she appreciated the NRC's DEIS comments because NRC took a tough stance.

Conclusions/Action Items

The Yucca Mountain site sufficiency comments are a tier one priority issue for the ACNW. The Committee anticipates providing comments to the Commission on the site sufficiency strategy in June 2000 and on the staff's site sufficiency comments in April 2001.

3. Yucca Mountain Review Plan

Christiana H. Lui of the Division of Waste Management (DWM), Office of Nuclear Material Safety and Safeguards (NMSS), briefed the ACNW on the status of the preparation of the Yucca Mountain Review Plan (YMRP). The YMRP will be a dual-purpose document serving as a plan for the DWM staff's review of the anticipated license application from DOE to construct a repository for HLW disposal at Yucca Mountain, Nevada, and also as guidance to DOE for the format and content of its application. The focus of the review will be compliance with 10 CFR Part 63. The YMRP will go through several drafts that will be presented to and discussed with the public and DOE. The first draft, to be issued by April 14, 2000, will cover only postclosure repository safety.

The activities covered in the YMRP will result in an NRC Safety Evaluation Report on Yucca Mountain. The postclosure safety evaluation will consider the adequacy of DOE's performance assessment for demonstrating compliance with 10 CFR Part 63 and the performance assessments supporting site characterization activities, data, and models; DOE's analyses of features events and processes leading to disruptive scenarios; DOE's analyses of multiple barriers and human intrusion; DOE's handling of issues identified in DWM's Issue Resolution Status Reports; and performance confirmation.

Conclusions/Action Items

The ACNW will continue to follow the development of the YMRP and will be especially interested in the plan's treatment of multiple barriers and defense in depth in the postclosure sections.

4. Radionuclide Content of Slag

Linda A. Veblen of the NRC's Office of Nuclear Regulatory Research (RES) briefed the ACNW on her research at the Johns Hopkins University on the "Characterization of Radioactive Slags." The slags researched are typical of those containing radioactive uranium and thorium at several of the sites identified in the NRC's Site Decommissioning Management Plan. Dr. Veblen is developing methods for estimating the rates of leaching of uranium and thorium from slags that will be less uncertain than estimates from current crushed-sample methods that can overestimate leach rates and do not account in any way for long-term slag behavior. By examining modern (a few decades old) and ancient (hundreds to thousands of years old) slags using several macroscopic and microscopic techniques applied to uncrushed slags, Dr. Veblen has developed a conceptual model of uranium and thorium leaching from slags that accounts for weathering, glass instability, and mechanical and dissolution effects of hydration.

Conclusions/Action Items

Dr. Veblen's project is one of several RES projects that the ACNW will review during the year 2000. These reviews will form the basis for ACNW's report to the Commission on radioactive waste research.

5. Uranium Plume Attenuation

Patrick V. Brady of Sandia National Laboratories briefed the ACNW on the results of a task in the project, "Incorporation of Mechanistic Sorption Models into SEDSS," funded by RES. Dr. Brady's task in the project provides a database for comparison with predictions by first-principle sorption models being examined in the rest of the project. Reaction transport models, which might conceivably be used to predict plume movement, require extensive data inputs that are often uncertain, so that the models can rarely provide more than order-of-magnitude bounding estimates of contaminant movement in the subsurface. A more direct means for establishing the limits of contaminant transport is to examine actual plumes to determine if, collectively, plumes containing a particular contaminant behave in a similar fashion. If plumes containing a particular contaminant are observed to spread and attenuate in a reasonably consistent and characteristic fashion, the likely public health impact of particular plumes might subsequently be predicted *a priori*. Dr. Brady and several colleagues at Sandia critically examined several uranium plumes from ore bodies and contaminated sites for characteristics peculiar to uranium plume movement. The natural life cycle of a uranium plume appears to involve an initial movement away from a source region that occurs within a few years and does not exceed 2 kilometers, followed by a geologically long period of immobile quiescence. It appears that sorption, dilution, and precipitation are sufficient to limit the short-term (years to decades) advance of artificial uranium plumes. Weathering processes and secondary precipitation of oxidized uranyl phases appear to limit the long-term (thousands to millions of years) advance of natural uranium plumes.

Conclusions/Action Items

The RES-funded project, "Incorporation of Mechanistic Sorption Models into SEDSS," under which Dr. Brady's work was done, is one of several RES projects that the ACNW will review during 2000. Reviews such as this will contribute to the ACNW's report to the Commission on radioactive waste research.

6. Meeting With the Director of the Division of Waste Management, Office of Nuclear Material Safety and Safeguards

John Greeves, Director of DWM, NMSS, presented an update on the activities underway in DWM. The NRC's HLW regulation, 10 CFR Part 63, is due to the Commission in mid-April 2000. The YMRP is taking form, and stakeholder meetings have taken place. NRC expects to make Yucca Mountain site sufficiency comments by May 2001. It was suggested that the ACNW have its comments to the Commission by April 2001. The NRC staff expects to provide comments to
the Commission for consideration and forwarding to DOE on the Yucca Mountain siting guidance, 10 CFR Part 963, in late spring or early summer 2000. It was suggested that the ACNW monitor this process. The Committee was invited to follow the progress of the Maine

Yankee decommissioning project, which is attempting to use the rubblization decommissioning concept.

Conclusions/Action Items

This was one of a periodic set of meetings with the Director of DWM to discuss items of mutual interest.

PROPOSED SCHEDULE FOR THE 119th ACNW MEETING

The Committee agreed to consider the following issues at its 119th meeting on June 13–15, 2000:

- **ACNW Planning and Procedures** — The ACNW staff will brief its Committee on issues to be covered during this meeting. The Committee will consider topics proposed for future consideration by the full Committee and working groups. The Committee will discuss ACNW-related activities of individual members.

- **License Termination Policy for the West Valley Site** — The Committee will hear a presentation from the NRC staff on public comments regarding the license termination policy being developed for the West Valley Demonstration Project, New York site.

- **Branch Technical Position on Low-Level Waste Performance Assessment** — The Committee will be briefed and will issue a report on the final version of the Branch Technical Position (BTP) on Low-Level Waste Performance Assessment. The response to public comments on the BTP will form a portion of the review.

- **Preparation for the Next Meeting With the Commission** — The Committee will begin preparation for the next meeting with the Commission. Potential topics include ACNW comments on the proposed HLW regulation, 10 CFR Part 63; the ACNW 2000 Action Plan and Self-Assessment; the control of solid materials; and a recent ACNW trip to the United Kingdom and France.

- **Yucca Mountain Performance Confirmation Program** — The Committee will hear an overview from the Department of Energy (DOE) on the Yucca Mountain performance confirmation program.

- **Design of the Proposed Yucca Mountain High-Level Waste Repository** — The Committee will hear a description by DOE of the latest details regarding the design of the proposed Yucca Mountain HLW repository.

- **Status of the Nuclear Regulatory Commission's Low-Level Waste Program** — The Committee will hear a presentation by the NRC staff on the current status of the Commission's low-level waste program.

- **Meeting With the Director of the Division of Waste Management, Office of Nuclear Material Safety and Safeguards** — The Committee will meet with the Director of the Division of

Waste Management, Office of Nuclear Material Safety and Safeguards, to discuss items of mutual interest.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

The 120th ACNW meeting has been scheduled for July 25–27, 2000.

Sincerely,

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B. John Garrick
Chairman