

February 7, 2001

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

SUBJECT: COMMENTS ON IMPROVEMENTS IN NRC STAFF'S CAPABILITY IN
PERFORMANCE ASSESSMENT

Dear Chairman Meserve:

During its 123rd meeting, November 27-29, 2000, the Advisory Committee on Nuclear Waste (ACNW) heard presentations from the NRC and the Center for Nuclear Waste Regulatory Analyses (CNWRA) on the status of the NRC's performance assessment (PA) capability in the high-level waste program. The presentations focused on NRC's Total-system Performance Assessment (TPA) code and the methodologies used by the staff to address uncertainty, sensitivity, and importance ranking.

We have been following developments in the staff's performance assessment capability for several years and have offered numerous observations and recommendations. Some of our recommendations (see references) were as follows:

- ! Strengthen staff capability in engineering analysis, materials science, and chemistry;
- ! Improve the methods for exposing the contribution to the performance of individual barriers;
- ! Develop the means to rank contributors to risk by importance;
- ! Seek peer review of the NRC's TPA code to enhance acceptance of the analytical methods;
- ! Use realistic models and parameters to the extent possible that can be supported by the evidence; and
- ! Generally improve the transparency and comprehensiveness of the analysis tools.

We are pleased with the progress that has been made. While many of our recommendations are still "works in progress," it is clear that a major effort has been made to address our concerns and to improve the staff's overall capability in PA. The TPA code has been improved and structured so that in the near term it should be an effective tool for evaluating the U.S. Department of Energy's Total System Performance Assessment of the proposed Yucca Mountain high-level waste repository.

We were especially pleased that the staff obtained a peer review of the TPA code. We considered especially important the peer review group's comments on the need for the code to assess and track the composition of water that could contact the waste package. We were pleased to hear that the staff intends to modify the TPA code to calculate the chemical composition of water at various locations in the repository system. The staff is considering its responses to the other recommendations of the external peer review group members.

The Committee would have preferred a peer review group consensus report rather than independent reports from each reviewer. We believe that the group kick-off meeting involving several days of briefings and discussions and subsequent teleconferences helped offset the lack of consensus deliberation on the issues.

We have reviewed the capability, guidance, and tools associated with performance assessment issues over the past several years and are satisfied that the NRC staff is responding to the various recommendations made by the Committee. We believe these staff activities are helping to improve its overall PA capability.

Sincerely,

/RA/

B. John Garrick
Chairman

References:

1. Letter dated October 8, 1997 from B. John Garrick, ACNW Chairman, to Shirley Ann Jackson, Chairman, U.S. Nuclear Regulatory Commission, Subject: Comments on Performance Assessment Capability in the NRC High-Level Radioactive Waste Program.
2. Letter dated October 31, 1997, from B. John Garrick, ACNW Chairman, to Shirley Ann Jackson, Chairman, U.S. Nuclear Regulatory Commission, Subject: Application of Probabilistic Risk Assessment Methods to Performance Assessment in the NRC High-Level Waste Program.
3. Letter dated July 29, 1998, from B. John Garrick, ACNW Chairman, to Shirley Ann Jackson, Chairman, U.S. Nuclear Regulatory Commission, Subject: Comments on NRC's Total System Sensitivity Studies for the Proposed High-Level Radioactive Waste Repository at Yucca Mountain, Nevada.

4. Letter dated September 9, 1998, from B. John Garrick, ACNW Chairman, to Shirley Ann Jackson, Chairman, U.S. Nuclear Regulatory Commission, Subject: Issues and Recommendations Concerning the Near-field Environment and the Performance of Engineered Barriers at Yucca Mountain.
5. Letter dated January 12, 1999, from B. John Garrick, ACNW Chairman, to Shirley Ann Jackson, Chairman, U.S. Nuclear Regulatory Commission, Subject: Comments on the Regulatory Uses of Importance Measures for Waste Management and Possible Application to the Proposed High-Level Radioactive Waste Repository at Yucca Mountain, Nevada.
6. Letter dated April 8, 1999, from B. John Garrick, ACNW Chairman, to Shirley Ann Jackson, Chairman, U.S. Nuclear Regulatory Commission, Subject: Comments on the Department of Energy's Viability Assessment for the Proposed High-Level Radioactive Waste Repository at Yucca Mountain, Nevada.