

September 18, 2002

Dr. George M. Hornberger, Chairman
Advisory Committee on Nuclear Waste
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: RESPONSE TO THE ADVISORY COMMITTEE ON NUCLEAR WASTE LETTER
DATED AUGUST 7, 2002, ON THE HIGH LEVEL WASTE PERFORMANCE
ASSESSMENT SENSITIVITY STUDIES

Dear Dr. Hornberger:

I am responding to your letter, dated August 7, 2002, that provided the Advisory Committee on Nuclear Waste's (ACNW's) views on the U.S. Nuclear Regulatory Commission (NRC) staff's High-Level Waste performance assessment sensitivity studies. In the letter, ACNW noted its general agreement with the goals of the staff's sensitivity and uncertainty analysis methods development process and encourages the staff to continue to enhance its capability to employ quantitative risk-assessment methods. However, ACNW also noted that the presentation was very analytically oriented at the parameter level without a clear roadmap to the bottom-line results or specific physical systems. As a result, ACNW recommended that the methods development work on parametric sensitivity and uncertainty analysis establish clear linkage to the performance of individual barriers; ensure that uncertainty in the model abstraction process is adequately considered and discussed; and consider an approach to convey the results of these types of analyses to a wide range of potential audiences (e.g., technical and non-technical) to build confidence in the results of performance assessment.

The staff agrees with the ACNW recommendations. As ACNW noted in its letter, the staff briefing of its results for parameter and barrier sensitivity was of a very technical nature (e.g., fractional factorial design for a range of barrier performance) and difficult to follow without significant familiarity with the analytical techniques and the models and assumptions used in the analysis. The staff understands the importance of being able to explain clearly the purpose and the results of its analyses to technical and non-technical audiences and continues to evaluate alternative methods to effectively presenting its results.

As you are aware, the staff has developed a Framework for Staff Analyses. This framework identifies the types of analyses that may be performed within the context of the Yucca Mountain Review Plan to guide pre-licensing issue resolution, review of a potential application, and preparation of the Safety Evaluation Report. These analyses are used to understand the overall performance of the repository, including the capabilities of natural and engineered barriers and the effect of uncertainty in parameters and models. We agree with the Committee's concern that model uncertainty is important and should receive more consideration in future sensitivity and uncertainty analyses. The staff believes that the framework will address ACNW's concerns, such as the clear linkage to the performance of individual barriers or physical systems, and approaches for evaluating model uncertainty. The staff intends to brief ACNW in the near future on this framework.

Dr. G. M. Hornberger

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The NRC staff appreciates ACNW's continued interest in, and input to, the staff's approach to sensitivity and uncertainty analysis methodology. We look forward to your continued involvement in our future activities.

Sincerely,

/RA by Carl J. Paperiello Action For/

William D. Travers
Executive Director
for Operations

cc: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
SECY

Dr. G. M. Hornberger

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