



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

ACN-89-001

August 21, 1989

The Honorable Kenneth M. Carr  
Chairman  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Chairman Carr:

SUBJECT: COMMENTS ON ACNW REVIEW OF THE NRC ANALYSIS OF THE DOE SITE  
CHARACTERIZATION PLAN

In response to the July 21, 1989 memorandum from the Secretary of the Commission, we are pleased to offer the following comments on the NRC analysis of the Site Characterization Plan (SCP) prepared by the U.S. Department of Energy (DOE). Our report of July 3, 1989, which this report supplements, was based on the draft of the Site Characterization Analysis (SCA), including the draft comments of the Director, Office of Nuclear Material Safety and Safeguards (NMSS), available at the time of our 12th meeting, June 28-30, 1989.

The Committee is in general agreement with the overall content of the SCA's point papers. However, our report of July 3, 1989 contained three comments that we deem to be of particular significance. The first two are what we consider to be areas of disagreement with the comments of the Director, NMSS. Our third comment was an expression of concern related to DOE's schedule for implementation of their quality assurance programs.

These specific comments are presented below, with discussions of the specific subject areas where there are disagreements:

1. "The absence in the SCP of statements addressing the systematic and early identification and evaluation of potentially disqualifying features at the Yucca Mountain Site."

The Director has attempted to address this issue in his proposed letter for transmitting the SCA to the DOE (SECY-89-199). However, he has addressed this issue in what we consider to be an implicit rather than an explicit manner, and has referred to it as a "second level of concern." We believe that it is a basic deficiency in the SCP and should have been directly addressed in the Director's comments.

In item (2) at the top of page 3 of his proposed letter, the Director states that "Investigations associated with tectonic phenomena should receive early attention" and that "an understanding (of such phenomena) is critical to evaluating the site

suitability in terms of potentially adverse conditions...." However, neither in the Director's proposed letter of transmittal nor in his "Comments" does he call for the systematic and early identification and evaluation of all potentially disqualifying features.

Our recommendation that this point be emphasized is based upon two concerns: (a) DOE officials in their presentations to this Committee stated that, if disqualifying features were present, they would "pop up" (as contrasted to having a plan to actively seek them out), and (b) the NRC staff's call for the search for potentially disqualifying features could be interpreted as being limited to tectonic phenomena. We believe that tectonic phenomena are but one of several such features that should receive attention. For example, the NRC regulations require that the pre-waste-emplacement groundwater travel time along the fastest path from the disturbed zone to the accessible environment shall be at least one thousand years. We believe that confirmation of the suitability of the site with respect to this and similar parameters should also be emphasized.

2. "The apparent lack of sufficient attention to the limitations and uncertainties in the Yucca Mountain data bases, and the associated difficulties in demonstrating that the repository will comply with the Environmental Protection Agency (EPA) standard (40 CFR Part 191, 'Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes')."

Here, the key factor is that the EPA Standard is probabilistic and therefore the methods for demonstrating compliance must have a probabilistic base. The approach to be used includes the construction of a Complementary Cumulative Distribution Function (CCDF) and, through this process, a demonstration that the repository complies with the EPA Standard. Our primary concerns are the uncertainties and limitations in the data to be used to construct the CCDF. Since the ability to resolve these uncertainties experimentally may well be beyond the capability of the site characterization program, increased consideration should be given to the feasibility of developing deterministic criteria for judging the adequacy of the site relative to the EPA Standard.

In its discussions with members of the NRC staff, the Committee was given the impression that, while the staff could readily construct a CCDF, there would be considerable limitations and uncertainties in the data that they would be using. Although EPA, in response to earlier concerns on the part of the NRC staff, added caveats to their Standard to make the demonstration of compliance easier to achieve, consultants to the ACNW are

August 21, 1989

strong in their belief that this does not resolve the problem of demonstrating compliance with the EPA Standard. A review of the background on the development of the EPA Standard reveals that an awareness of these problems is not new. Other groups, including EPA's Science Advisory Board, have expressed concerns about this matter in the past.

In summary, we consider the demonstration of compliance of the proposed repository with the EPA Standard to be a major concern. The Committee is scheduled to meet with the NRC Staff on this and related matters and expects to provide you with additional comments as this work progresses.

3. "Delays by DOE in implementing satisfactory quality assurance (QA) programs."

This concern is one that we share with the NRC staff. If there is an area of disagreement, it is that we would have been less tolerant of the continuing delays in the implementation of the QA programs.

In addition to the above, the Committee offered a number of comments pertaining to other specific aspects of the site characterization program. In the main, these comments have been, or are being, addressed by the NRC and/or DOE. Examples include the meetings that are under way between the NRC and DOE staffs relative to the location of the Exploratory Shaft Facility and its associated Title I and Title II designs. As was the case with the NRC comments on quality assurance programs, any areas of disagreement on these issues between this Committee and the NRC staff are related primarily to the degree of emphasis given to an item, rather than to a fundamental disagreement on the technical aspects of the review.

We hope this provides the information you need. Should questions remain, or if we can be of further assistance, please let us know.

Sincerely,



Dade W. Moeller  
Chairman

**References::**

1. SECY-89-199, Memorandum dated July 3, 1989 for the Commissioners from Hugh L. Thompson, Jr., Office of the Executive Director for Operations, Subject: NRC Staff Review of the Department of Energy's Site Characterization Plan, Yucca Mountain Site, Nevada Research and Development Area, Nevada.

August 21, 1989

2. Letter dated February 17, 1984, from Herman E. Collier, Jr., U. S. Environmental Protection Agency, to William D. Ruckelshaus, Administrator, EPA, transmitting EPA report dated January 1984 entitled "Report on the Review of Proposed Environmental Standards for the Management and Disposal of Spent Nuclear Fuel High-Level and Transuranic Radioactive Wastes (40 CFR 191)."