

AUG 04 1994

Mr. Ronald A. Milner, Acting Director
Office of Program Management and Integration
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Milner:

SUBJECT: EVALUATION OF U.S. DEPARTMENT OF ENERGY SUPPLEMENTAL RESPONSES TO
SITE CHARACTERIZATION ANALYSIS COMMENTS 99, 102, AND 103 REGARDING
TOTAL SYSTEM PERFORMANCE

On December 23, 1993, (letter from Shelor to Reamer), the U.S. Department of Energy (DOE) transmitted supplemental responses to Site Characterization Analysis (SCA) Comments 99, 102, and 103, identified as open items in the Nuclear Regulatory Commission staff's SCA. These three comments relate to developing scenarios for total system performance assessment. NRC staff has considered the additional information submitted on July 14, 1994, including information on the related Comment 95, which was provided to supplement the material on Comment 99. Based on the staff's evaluation of DOE's supplemental responses (see enclosure), we believe that SCA comments 99, 102, and 103 should remain open.

While the staff is encouraged by the progress DOE has described for resolving Comments 99, 102 and 103, it is important to understand that the staff's process for resolving any open items includes reviewing DOE's documentation of the proposed approach and obtaining clarifications if necessary. Should you desire, further discussion of the open items can be included in the agenda for the forthcoming meeting on Total System Performance Assessment. If you have questions about these SCA open items, please contact Ms. Pauline Brooks of my staff at (301) 415-6604.

Sincerely,

Joseph J. Holonich, Chief
High-Level Waste and Uranium
Recovery Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosures: As stated
cc: See attached list

Distribution: See attached list

*See Previous Concurrence

Mark Small Boxes in Concurrence Block to Define Distribution Copy Preference

In small Box on "OFC:" line enter: C = Cover E = Cover & Enclosure N = No Copy

OFC	HLUR		HLUR*	<input checked="" type="checkbox"/>	HLUR	<input checked="" type="checkbox"/>		
NAME	PBrooks/jk		RJohnson		JHolonich			
DATE	08/02/94		07/ /94		07/13/94			

Path & File Name: S:\DWM\HLUR\PPB\SCACLOSE:802

OFFICIAL RECORD COPY

9408120263 940804
PDR WASTE
WM-11 PDR

102.8
NH16-11
WM-11

Section 8.3.5.13 Total System Performance

SCA COMMENT 99

For some scenario classes in which a particular release mode is thought to dominate or, at least, dominate for a particular time period, the consequences that are calculated may not be adequately represented unless all of the release modes are quantified, especially the residual part of the inventory continuing to participate in the nominal or undisturbed mode(s) of release. Premature and inappropriate limiting of the consequence analysis in this way may distort the performance allocation process so that insufficient priority is placed on some data or important data acquisition activities may be omitted from site characterization.

EVALUATION OF DOE RESPONSE

- Site Characterization Analysis (SCA) Comment 99 (NRC, 1989) expressed NRC staff concerns that in evaluating the impacts of a scenario on long-term repository performance, DOE would need to consider releases along all potential release pathways throughout the full period of regulatory interest, and not to rely solely on releases via a perceived "dominant," and potentially short-lived, release pathway. The staff did allow that the "use of a single mode of release to calculate consequences for a given scenario is acceptable only when calculations show that the releases by modes that have been omitted do not contribute to the Complementary Cumulative Distribution Function (CCDF) in a substantial fashion, either individually or aggregated over the entire range of scenarios" (NRC, 1989).

The staff recommended that calculations of consequences from each scenario include all appropriate modes of radionuclide release, and that the performance allocation process should consider all release modes from each scenario, with appropriate consideration given to the magnitude of release via the different modes.

- In its response, the U.S. Department of Energy (DOE) expressed its belief that the NRC staff position "suggests a course of extraordinary rigor" and that following such a course of action would require DOE to expend significant resources in determining probabilities of occurrence or quantifying consequences for contributors (i.e., processes and events) preliminarily determined to be minor. The DOE believes that the prioritization of site work (and thus, site characterization, as a whole) must be based on "a partial and preliminary understanding of site performance."
- The DOE further states that it believes that its performance assessment program is acting faithfully on the spirit of the staff's recommendations in SCA Comment 99, and on this basis, DOE believes the comment should be resolved.
- The NRC staff considers its position to be a reasonable and appropriate approach to estimating the consequences of scenarios on long-term repository performance. The staff considers it reasonable to expect that in DOE's compliance demonstrations for the overall system performance objective (10 CFR 60.112), calculations of radionuclide releases for all

CCDF will be included. Appropriate analyses should be included to support the omission of potential radionuclide release pathways of a scenario on the basis of lack of contribution to the CCDF in the compliance demonstration.

- The staff notes that the concerns expressed in Comment 99 were reiterated in the NRC staff concerns on DOE's TSPA-1991 (Barnard, et al., 1992) (see letter from Holonich to Shelor, dated October 21, 1993). The staff observed that DOE's analysis of consequences due to volcanism did not include radionuclide releases which could occur prior to, and following, the period of volcanic activity, and therefore, did not include releases via all potentially important release pathways over the full 10,000-year period of regulatory interest.
- The staff considers that this comment will be resolved when DOE provides information indicating how various release pathways are being addressed in performance allocation and the calculations of the CCDF.
- The NRC staff considers this comment open.

REFERENCES

Barnard, R.W., et al., 1992, "TSPA 1991: An Initial Total-System Performance Assessment for Yucca Mountain," SAND91-2795, Sandia National Laboratories, Albuquerque, New Mexico. [Prepared for the U.S. Department of Energy]

U.S. Nuclear Regulatory Commission, 1989, "NRC Staff Site Characterization Analysis of the Department of Energy's Site Characterization Plan, Yucca Mountain Site, Nevada," NUREG-1347, Office of Nuclear Material Safety and Safeguards, Washington, D.C..

Section 8.3.5.13 Total System Performance

SCA COMMENT 102

The model for Ross sequences number 10 (p. 8.3.5.13-29), 14 and 15 (p. 8.3.5.13-30) seems to be at variance with the hydrologic model of flow at Yucca Mountain; because (as in this case) the basis for developing scenarios to guide the site characterization program appears to be inconsistent, site characterization may fail to provide the information needed for licensing.

EVALUATION OF DOE RESPONSE

- The DOE states that the approach in the Site Characterization Plan (SCP) has been superseded by a more "exhaustive and systematic" approach. It believes this new approach, when completed, will provide an appropriate degree of separation between conceptual model considerations and scenario definitions. Based on the development of this revised approach, the DOE considers that a "defensible analysis" is being applied to the screening of scenarios, and therefore, it considers the comment to be resolved.
- The staff has not received DOE's revised approach but looks forward to reviewing it within, and documented through, DOE's iterative performance assessment program, together with its impacts on the direction of the site characterization program. Based on the outcome of these reviews, the staff will determine if the comment is resolved.
- The NRC staff considers this comment open.

Section 8.3.5.13 Total System Performance

SCA COMMENT 103

Ross sequence numbers 59-62 and 64-69 appear to characterize either anticipated conditions or alternative conceptual models, rather than scenarios.

EVALUATION OF DOE RESPONSE

- The DOE states that the approach in the SCP has been superseded by a more "exhaustive and systematic" approach. It believes this new approach, when completed, will provide an appropriate degree of separation between conceptual model considerations and scenario definitions. Based on the development of this revised approach, the DOE considers that a "defensible analysis" is being applied to the screening of scenarios, and therefore, it considers the comment to be resolved.
- The staff has not received DOE's revised approach but looks forward to reviewing it within and documented through, DOE's iterative performance assesment program, together with its impacts on the direction of the site characterization program. Based on the outcome of these reviews, the staff will determine if the comment is resolved.
- The NRC staff considers this comment open.

cc: List for Letter to Mr. Ronald A. Milner Dated:

8/4/94

R. Loux, State of Nevada
T. J. Hickey, Nevada Legislative Committee
J. Meder, Nevada Legislative Counsel Bureau
R. Nelson, YMPO
M. Murphy, Nye County, NV
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
D. Weigel, GAO
P. Niedzielski-Eichner, Nye County, NV
B. Mettam, Inyo County, CA
V. Poe, Mineral County, NV
F. Mariani, White Pine County, NV
R. Williams, Lander County, NV
L. Fiorenzi, Eureka County, NV
J. Hoffman, Esmeralda County, NV
C. Schank, Churchill County, NV
L. Bradshaw, Nye County, NV
W. Barnard, NWTRB

Distribution list for Mr. Ronald A. Milner Letter Dated:

8/4/94

Central File

DWM r/f

JSurmeier

MBell

MFederline

HLUR r/f

PDR\LPDR\LSS

ACNW

On-Site Reps

CNWR

PBrooks

RJohnson

JGreeves w/o encl