

**Summary of Center for Nuclear Waste Regulatory
Analyses (CNWRA) Comments on EPA's Review of
WIPP Performance Assessment**

2/4

SUMMARY OF CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES (CNWRA)
COMMENTS ON EPA'S REVIEW OF WIPP PERFORMANCE ASSESSMENT

1. Significant comments the NRC should be aware of

(i) Use of Expert Panels

The U.S. Environmental Protection Agency (EPA) statements on the use of expert judgment are ambiguous and do not establish a clear regulatory policy. For example, in their cover letter the EPA states "We strongly *recommend* that DOE use data where it is possible to obtain it, instead of relying on expert judgment." They also state that "... care needs to be taken when *substituting* estimates for actual data." The latter statement suggests that EPA is amenable to allowing DOE to substitute expert judgments for data. Thus, the EPA should be encouraged to adopt the stated NRC policy that expert judgments shall not be used to replace actual data, where there is a reasonable means of obtaining that data. Also, the EPA should be made aware of the recent CNWRA reports dealing with the demonstration of expert judgment in Performance Assessment (PA) and the current development of a Technical Position on a formal procedure for elicitation of expert judgments.

(ii) Access to Information

In the cover letter, the EPA clearly and effectively communicates the requirement that DOE make available or provide access to the PA codes, their documentation, and laboratory and field data. This is excellent early notification of information required to permit a thorough review of DOE's Waste Isolation Pilot Plant (WIPP) PA. The NRC has similarly notified DOE Yucca Mountain (YM) about the need for access to site characterization data. However, the NRC has yet to take a similar action with regards to computer codes used in Total-System Performance Assessment (TSPA) and auxiliary analyses for YM.

(iii) Shaft Seals

In the detailed comments, the EPA reviewers generated extensive comments on the issues related to the shaft seals and backfill. Seal performance is perhaps a greater concern in the case of WIPP repository than that at YM. However, the DOE YM project has not performed any PAs or auxiliary analyses to examine or bound the possible impact of shaft (i.e., ventilation) seals on total-system performance. The CNWRA has performed a reconnaissance level PA study and follow-on work is planned. However, in future interactions with the DOE YM, the NRC should make comments so that seal performance issues are addressed.

2. Areas where EPA and NRC are making similar comments on aspects of PA

(i) Conceptual Models

The EPA comments indicate that they place a high degree of importance on the DOE development and evaluation of alternate conceptual models. The EPA states very effectively that "Before DOE submits an application for certification of compliance there should be general agreement between EPA and DOE on the conceptual models that will be used by DOE." Similar views have been expressed by the NRC and CNWRA in technical meetings with the DOE concerning YM. It would be prudent for the NRC to make a more formal statement of this requirement, perhaps as part of NRC comments on the DOE Five Year Plan for YM. The DOE Five Year Plan establishes a process for NRC review and acceptance of conceptual models. The DOE submittal of topical reports for PA models is the vehicle for this process.

(ii) Colloid Transport

In the detailed comments, the EPA reviewers raise the question of the possible importance of colloid transport of radionuclides. They also inquire about the DOE's plans to consider colloids in their future PAs for WIPP.

(iii) Probabilities and Scenarios

In a number of the detailed comments, the EPA reviewers appropriately request that the procedures used to estimate probabilities and screen scenarios be fully documented. In addition to requesting the basis for scenario that were selected, the EPA asks for documentation of the rationale for the scenarios that were screened out.

(iv) CCDF Construction

In the detailed comments, the EPA reviewer raises the question of how the Complementary Cumulative Distribution Functions (CCDFs) were developed and constructed. The NRC staff has raised similar questions about the method of CCDF construction and appropriateness of comparisons with the EPA standard. The DOE TSPA calculations for YM, like those for WIPP, generally focus on conditional CCDFs, particularly for the nominal case. In contrast, the NRC employs an approach where all the conditional CCDFs are used in computing the total CCDF, which is then compared to the standard.

3. Areas where EPA and NRC approaches are distinctly divergent

(i) Quality Assurance

The general and specific comments to DOE suggest that EPA has a less defined and structured approach to Quality Assurance (QA) of codes and data than the NRC. The EPA cover letter makes use of the term QA "guidelines" (as opposed to QA procedures or requirements) which may reflect that the EPA has a distinct vision of a QA program.

On the software QA, for example, the EPA comments do not make reference to any specific QA guidelines or procedures [e.g., the American National Standards Institute (ANSI), Institute of Electrical and Electronic Engineers (IEEE), NUREG-0856, and 10 CFR 50 Appendix B 18 criteria]. There is no apparent recognition of the related software QA aspects, such as independent testing (i.e., verification, benchmarking, and validation) or of configuration management of codes.

With regards to data, the EPA comments express the need to use QA procedures to qualify "old data," such as that produced by site characterization and completed laboratory studies. There is no apparent knowledge of the NRC document "Qualification of Existing Data for High-Level Nuclear Waste Repositories," (NUREG-1298) which was issued in February 1988. This document presents four acceptable methods by which old data may be qualified.

References

- (i) Silling, S.A. 1983. Final Technical Position on Documentation of Computer Codes for High-Level Waste Management, Nuclear Regulatory Commission, Washington, DC.
- (ii) IEEE. 1986. IEEE Standard for Software Verification and Validation Plans, Institute of Electrical and Electronic Engineers, New York, NY.

- (iii) **ANSI. 1987. American National Standard Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry, American Nuclear Society, La Grange Park, IL.**
- (iv) **Altman, W.D., J.P. Donnelly, and J.E. Kennedy. 1988. Qualification of Existing Data for High-Level Nuclear Waste Repositories, NUREG-1298, Nuclear Regulatory Commission, Washington, DC.**