

October 5, 2006

Mr. Mark H. Williams, Director
Regulatory Authority Office
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1551 Hillshire Drive
North Las Vegas, NV 89134-6321

SUBJECT: KEY MESSAGES FOR THE OCTOBER 24-25, 2006, U.S. NUCLEAR
REGULATORY COMMISSION AND THE U.S. DEPARTMENT OF ENERGY
TECHNICAL EXCHANGE AND MANAGEMENT MEETING ON TOTAL SYSTEM
PERFORMANCE ASSESSMENT

Dear Mr. Williams:

The purpose of this letter is to identify key messages that the U.S. Nuclear Regulatory Commission (NRC) staff will discuss at the October 24-25, 2006, NRC/U.S. Department of Energy (DOE) Technical Exchange and Management Meeting on Total System Performance Assessment (TSPA). NRC is committed to conducting effective and efficient prelicensing interactions with DOE to facilitate a timely review of a license application. Our goal for this meeting is to improve NRC staff understanding of the current status of the TSPA and to improve DOE understanding of NRC expectations regarding the TSPA. Conveying the staff's key messages for the technical exchange will allow DOE to focus on the issues of particular interest to the NRC staff.

Therefore, DOE should be aware that:

- Any analysis using the TSPA model included in a license application should be clearly linked to a specific regulatory requirement. NRC review of the DOE performance assessment is intended to determine whether all regulatory requirements have been met. The way in which a performance assessment analysis will be reviewed will be based on the regulatory requirement that the analysis is designed to address.
- Documentation of capability of barriers important to waste isolation needs to be consistent with the TSPA (10 CFR 63.115). NRC staff will use risk information in the review of a potential license application to ensure that the review focuses on risk-significant items. The barrier credit taken explicitly or implicitly by the DOE performance assessment is an important aspect in determining which aspects of the DOE safety case are risk-significant. Documentation of barrier capability should therefore be adequate to demonstrate understanding of barrier performance and implementation in the performance assessment.
- Sufficient and clear documentation in the scenario analysis is needed so that NRC can understand the implementation of specific features, events, or processes (FEPs) within the performance assessment (10 CFR 63.114). The treatment of scenario analysis

offers the opportunity to enhance traceability and transparency by clearly linking included FEPs to model abstractions and by ensuring that FEPs are identified at an appropriate level of detail. In addition, a consistent basis for screening decisions should be applied to all FEPs.

- An appropriate treatment of uncertainty is a necessary element of the performance assessment (10 CFR 63.114). The analysis of uncertainty required by 10 CFR 63.114 should be sufficient to allow determination as to whether the analysis provides a reasonable expectation of compliance (10 CFR 63.303-304). An appropriate treatment of uncertainty across the individual abstractions is required to ensure that the integrated total system analysis appropriately reflects the uncertainties in the evaluation of system performance. Use of conservative values or choices does not relieve DOE of the responsibility for providing an adequate technical basis for the representation of any particular FEP.
- A quality assurance program that meets the regulatory requirements of Subpart G of 10 CFR Part 63 and is effectively implemented is needed, as is a clear description of the technical bases for models in the performance assessment (10 CFR 63.114). Confidence in a performance assessment is enhanced when it is developed under adequately designed and implemented quality assurance procedures and when the outputs of the performance assessment are supported by objective comparisons with results from detailed process-level models, laboratory testing or field investigations, or natural analogs. Although procedures in place for qualification of TSPA models appear adequate, NRC notes that implementation of the quality assurance requirements will be examined during NRC review of a potential license application.

If you have any questions about this matter, please contact Keith L. Compton, of my staff, at (301) 415-5495, or by e-mail, at klc@nrc.gov.

Sincerely,

/RA/

Lawrence E. Kokajko, Director
Division of High-Level Waste Repository Safety
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Letter to M. Williams from L. Kokajko dated: October 5, 2006

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