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TRANSMITTAL OF *SUMMARY OF PRECLOSURE SAFETY ANALYSIS RELIABILITY ASSESSMENT METHODOLOGY*

At the May 16-17, 2006, U.S. Nuclear Regulatory Commission (NRC)/U.S. Department of Energy (DOE) Technical Exchange and Management Meeting on Preclosure Safety Analysis (PCSA) and Supporting Information, the DOE committed to provide the NRC a summary of the methodology for estimating reliability of structures, systems, and components (SSC) by August 25, 2006. As indicated in the summary of the Technical Exchange and Management Meeting report, the following are the highlights of the NRC expectations and guidance on the reliability assessment methodology:

- Reliability for SSCs is needed to perform PCSA and to categorize event sequences
- DOE must provide technical bases for reliability estimates and the approach
- 10 CFR Part 63 makes no distinction between active and passive SSCs, for the purpose of estimating reliability
- Different approaches may be used to estimate the reliability of SSCs, provided that sufficient technical bases are specified
- The use of accepted engineering practice, including the use of consensus codes and standards, is a practical method to ensure high confidence in reliability. For performance of the PCSA, the DOE must provide a quantification of this high degree of confidence through the reliability assessment process
- The quantification of SSC reliability needs to be sufficient to allow event sequences to be categorized as Category 1, Category 2, and Beyond Category 2 event sequences



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- The reliability assessment for SSCs should be attempted at the highest level possible, typically the system level
- Human reliability should be taken into account

In response to the commitment and the NRC guidance, DOE prepared the enclosed report entitled *Summary of Preclosure Safety Analysis Reliability Assessment Methodology*. The report was prepared to provide a summary of the methodology that is used to conduct reliability assessments to support the Yucca Mountain, Nevada, repository PCSA event sequence quantification and categorization.

The reliability assessment methodology supports the following activities:

- Estimation of the frequency of occurrence for initiating events identified in the event sequence categorization
- Estimation of the probability of human failure events if identified in the event sequence categorization
- Estimation of the reliability of Important To Safety SSCs and Procedural Safety Controls (PSC) that are credited to prevent or mitigate the consequence of event sequences
- Identification of sources of empirical data related to reliability of SSCs

If you have any questions, please feel free to contact me at (202) 586-9069 or e-mail mark_williams@ymp.gov, or Paul G. Harrington at (702) 794-5415 or e-mail paul_harrington@ymp.gov, or Joe C. Price at (702) 794-1441 or e-mail joe_price@ymp.gov. There are no new regulatory commitments in this letter or its enclosure.


Mark H. Williams, Director
Regulatory Authority Office

OCE:WRS-1397

Enclosure:
Summary of Preclosure Safety Analysis
Reliability Assessment Methodology

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