

Tools and Guidance for Independently Evaluating the Safety of the Proposed Yucca Mountain Repository

LESLIE, Bret W., U.S. Nuclear Regulatory Commission, MS T-7F3, Washington, DC 20555-0001, bwl@nrc.gov

Disposal of high-level nuclear waste requires a U.S. Nuclear Regulatory Commission (NRC) license. Part 63 under Title 10 of the U.S. Code of Federal Regulations (“Disposal of High-Level Radioactive Wastes in a Proposed Geologic Repository at Yucca Mountain, Nevada”) contains the governing regulations. These governing regulations are risk-informed and performance-based. The NRC will determine whether to issue a construction authorization and license for the proposed repository based, in part, on whether the U.S. Department of Energy (DOE) has demonstrated compliance with the performance objectives.

The NRC staff have developed specific guidance and tools to aid in conducting a risk-informed and performance-based regulatory program, including its licensing review. The Yucca Mountain Review Plan is guidance to the NRC staff for review of any license application from the DOE for a geologic repository for disposal of high-level radioactive waste at Yucca Mountain, Nevada. The review plan has separate sections for reviews of repository safety before permanent closure and repository safety after permanent closure. The NRC staff, along with its contractor, the Center for Nuclear Waste Analyses (CNWRA), have developed the Pre-Closure Safety Analysis (PCSA) Tool for use in the review of repository safety before permanent closure and the Total-System Performance (TPA) code for use in the review of repository safety after permanent closure. The PCSA tool combines parts of the integrated safety analysis methods used in the chemical industry and the risk assessment capabilities and tools used in the safety assessment of nuclear power reactors. The TPA code is a probabilistic performance assessment tool designed to simulate various natural and repository-induced processes that are expected to affect the long-term performance of the proposed repository. These tools and guidance will be further described in the presentation.

The NRC staff views expressed herein are preliminary and do not constitute a final judgement or determination of the matters addressed or of the acceptability of a license application for a geologic repository at Yucca Mountain.