

SA-7 Safety Strategic Plan Goal

Implementation Activity: **Incorporate Risk Information Into the High-Level Waste Regulatory Framework (NMSS/HLWRS/TRD)**

Primary FY 04-09 Strategic Plan Goal: Ensure protection of public health and safety and the environment.

Strategy 3: Use sound science and state-of-the-art methods to establish risk-informed and, where appropriate, performance-based regulations.

Secondary FY 04-09 Strategic Plan Goal: Ensure that NRC actions are effective, efficient, realistic, and timely.

Strategy 1: Use state-of-the-art methods and risk insights to improve the effectiveness and realism of NRC actions.

Primary Priority: High

Secondary Priority: High

Description of Activity:

The Yucca Mountain Review Plan (NUREG-1804, Rev 2, 2003) provides guidance to staff on implementing the risk-informed, performance-based regulations of 10 CFR Part 63. The staff will use the Yucca Mountain Review Plan to ensure that licensing reviews are risk-informed and the proper level of effort is focused on areas important to the safety of the potential geologic repository at Yucca Mountain, Nevada.

The staff completed the risk insights initiative in April 2004 and sent the Commission the Risk Insights Baseline Report. The Risk Insights Baseline Report provides an overall integrated perspective for evaluating the risk significance of repository issues and systems down to the subsystem level, and was subsequently incorporated into the Integrated Issue Resolution Status Report (NUREG-1762). The risk insights are used to focus pre-licensing activities on significant key technical issues. There were 293 agreements with the U.S. Department of Energy related to the key technical issues. These agreements were developed to assure incorporation of sound science into a review of the Yucca Mountain license application. Using this report, the NRC staff finished the evaluation of high-ranked agreements in December 2004. The staff also finished the review of most moderate to low ranked agreements in April 2005. Currently 257 are complete, 28 need additional information and require responses from the U.S. Department of Energy, and 8 are on hold pending the U.S. Department of Energy's resolution of the U.S. Geological Survey quality assurance issues involving the infiltration model. Evaluations for the remaining agreements will be completed after the U.S. Department of Energy provides responses for additional information needs and resolves the U.S. Geological Survey quality assurance issues. Staff will continue to use risk insights to evaluate any issues that may arise from potential changes to the U.S. Department of Energy's demonstration for pre-closure and post-closure performance and from considerations for time periods beyond 10,000 years.

In addition, the staff developed a License Application Project Plan in December 2004 to guide the process for conducting and documenting the license application review. Staff have used the License Application Project Plan, as revised, along with the Yucca Mountain Review Plan, and the Integrated Issue Resolution Status Report, including incorporated Risk Insights Baseline

Report, to guide development of specific review strategies for each of the model abstraction review teams. The staff also used risk insights to develop a risk-informed Yucca Mountain inspection program in September 2005. Staff completed an update to the current total-system performance assessment (TPA) code in June 2007 to facilitate calculations beyond 10,000 years, to incorporate proposed revisions to the regulatory requirements specified in 10 CFR Part 63, and to accommodate a review of potential U.S. Department of Energy design changes. Both the updated code and a detailed user guide for the code, completed in July 2007, have been made publicly available. The staff intends to refine the risk insights baseline as risk information becomes available and to utilize the baseline in reviewing a Yucca Mountain license application and conducting other regulatory activities.

Project Considerations: NRC's High-Level Waste program activities and milestones anticipated for Fiscal Year 2008 will be affected by external factors such as the timing of a license application for an High-Level Waste repository by the U.S. Department of Energy and uncertainties in the development of revised the U.S. Environmental Protection Agency's radiation protection standards for Yucca Mountain (40 CFR Part 197) as a result of public comment.

Selected Major Milestones and Schedules				
Major Milestones	Original Target Date	Revised Date	Completion Date	NRC Responsibility
Develop HLW inspection procedures using risk insights (complete seven integrated inspection procedures)	September 2004	December 2005	September 2005	NMSS/HLWRS/TRD
Complete risk-informed pre-closure and post-closure key technical issue resolution activities using risk insights	April 2005 [†]	TBD ^{††}		NMSS/HLWRS/TRD
Develop model abstraction review team strategies using risk insights	September 2006	December 2006	March 2007	NMSS/HLWRS/TRD
Develop Total-system Performance Assessment (TPA) code, Version 5.1	September 2006	June 2007	June 2007	NMSS/HLWRS/TRD

[†] Staff addressed all 293 Key Technical Issue Agreements using risk insights in April 2005 (see description for more detail).

^{††} Revised date will be established pending resolution of the U.S. Geological Survey quality assurance issues and receipt of the U.S. Department of Energy responses to agreements previously identified as needing additional information. This date will also consider the need for risk-informed resolution of potential issues arising from proposed revision of 10 CFR Part 63 and from DOE modifications to repository design, operations, approaches, methods, and models during pre-licensing. The U.S. Department of Energy has informed NRC that information on agreements which have additional information needs will be provided in the near future.

