

## PROPOSED KNOWLEDGE MANAGEMENT ACTIVITY (ROADMAP FOR USE OF TECHNICAL DOCUMENTATION)

To preserve relevant knowledge gained over many years of preparation and licensing review of the proposed geologic repository at Yucca Mountain, the U.S. Nuclear Regulatory Commission (NRC) technical staff proposes to develop a roadmap for the use of technical documentation that includes the regulatory framework (Task 1) and the technical review (Task 2), as described below.

The anticipated resources to develop the roadmap are estimated to require 0.60 full time equivalent (FTE) for NRC technical staff and \$20K for staff from the Center for Nuclear Waste Regulatory Analyses (CNWRA). Assuming a rate of \$240K for one FTE results in an estimated cost not to exceed \$164K needed to complete this knowledge management activity. Table 1 provides additional details on the resources.

Beginning in October 2013, the NRC has provided monthly reports to Congress on its activities and the NRC's expenditures from prior-year Nuclear Waste Fund (NWF) appropriations. Total unobligated NWF funds remaining as of May 31, 2020, are \$421,705. The expenditure of the resources for the roadmap development of \$164K would then leave a balance of approximately \$258K for other purposes. The only further NWF expenditures currently planned are the costs of preparing the monthly report to Congress, which currently averages \$500 per month.

### Task 1: Regulatory Framework for Yucca Mountain (Title 10 of the *Code of Federal Regulations* (10 CFR) Part 63)

The NRC conducted three rulemakings for site-specific regulations in 10 CFR Part 63: Disposal of High-Level Radioactive Wastes in a Proposed Geologic Repository at Yucca Mountain, NV, Final Rule, 66 FR 55732 (November 2, 2001); Specification of a Probability for Unlikely Features, Events and Processes, Final Rule, 67 FR 62628 (October 8, 2002); and Implementation of a Dose Standard After 10,000 Years, Final Rule, 74 FR 10811 (March 13, 2009).

The regulatory framework roadmap will:

- Identify key documents that supported development of technical aspects of the regulations, with particular focus on the regulations for the period after 10,000 years, and
- Explain and prioritize the significance of each of the key documents.

### Task 2: Technical Review for Yucca Mountain

The NRC spent nearly 20 years preparing to review the license application seeking authorization to construct a geologic repository at Yucca Mountain. During this time period, the NRC and Department of Energy (DOE) staff held numerous public technical exchanges to discuss both regulatory and technical issues. Over this period, the NRC increasingly used risk insights to assist the resolution of technical issues regarding a potential license application for Yucca Mountain (e.g., Integrated Issue Resolution Status Report – NUREG 1762; Rev. 1, 2005<sup>1</sup>). The development of risk methods and approaches together with risk insights were a

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<sup>1</sup> NUREG-1762, Integrated Issue Resolution Report Rev. 1 Vol. 1 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML05136159) and Vol. 2 (ADAMS) Accession Number ML051360241).

fundamental part of the High-Level Waste program in preparing for the license application review.

The staff completed the Safety Evaluation Report (SER) Volumes 2 thru 5 in 2014 and 2015. Volume 1 of the SER was completed in 2010. An important aspect of the NRC review was the use of risk insights to help determine the rigor of the review. For example, DOE was required, by regulation, to describe the barriers important to waste isolation and describe the significance of each barrier's contribution to safety and the associated technical basis. This risk information was considered by all NRC staff technical reviewers as a first step prior to conducting their discipline-specific review (e.g., seismic hazards, radionuclide transport in the geosphere). This risk-informed review allowed for a large number of reviewers (approximately 60-100 staff and contractors) to maintain a consistent approach for the rigor of the review and proceed on agreed-upon schedules.

A roadmap for key technical areas of the review, including the risk insights, will provide a more efficient and accessible backdrop for understanding the context of the overall SER approach. The goal is to reduce the time technical staff will need to develop capabilities to support any licensing proceeding. The technical review framework roadmap will:

- Identify key documents addressing technical areas of the review, and
- Explain and prioritize the significance of each of the key documents in addressing technical areas of the review.

**Table 1. Estimated Resources for Roadmap Development**

Activity	Focus	Resource and Cost Estimates			
		Staff	FTE	Center \$K	Total \$K
<i>Yucca Mountain Knowledge Management</i>					
Task 1a Regulatory Framework Document Identification	Technical support for key provisions in Part 63 (e.g., period after 10,000 years)	NMSS	0.10		24
		CNWRA		0	
		OGC	0.02		4.8
		<b>SUBTOTALS</b>	<b>0.12</b>		<b>28.8</b>
Task 1b Regulatory Framework Document Significance and Priority	As appropriate, additional descriptive or background material	NMSS	0.10		24
		CNWRA		5	5
		OGC	0.02		4.8
		<b>SUBTOTALS</b>	<b>0.12</b>	<b>5</b>	<b>33.8</b>
<b>TASK 1 TOTAL</b>			<b>0.24</b>	<b>5</b>	<b>62.6</b>
Task 2a Technical Review Document Identification	Key aspects of technical review, including use of risk insights	NMSS	0.14		33.6
		CNWRA		5	5
		OGC	0.02		4.8
		<b>SUBTOTALS</b>	<b>0.16</b>	<b>5</b>	<b>43.4</b>
Task 2b Technical Review Document Significance and Priority	As appropriate, additional descriptive or background material	NMSS	0.16		38.4
		CNWRA		10	10
		OGC	0.04		9.6
		<b>SUBTOTALS</b>	<b>0.20</b>	<b>10</b>	<b>58</b>
<b>TASK 2 TOTAL</b>			<b>0.36</b>	<b>15</b>	<b>101.4</b>
<b>OVERALL TOTAL</b>			<b>0.60</b>	<b>20</b>	<b>164</b>