



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

**PLEASE RESPOND BY:  
August 27, 2020**

COMSECY-20-0013

August 13, 2020

MEMORANDUM TO: Chairman Svinicki  
Commissioner Baran  
Commissioner Caputo  
Commissioner Wright  
Commissioner Hanson

FROM: Margaret M. Doane /**Darrell J. Roberts Acting for/** Darrell J. Roberts  
Executive Director for Operations

SUBJECT: KNOWLEDGE MANAGEMENT FOR HIGH-LEVEL WASTE DISPOSAL

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Darrell J. Roberts  
Date: 2020.08.13  
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The purpose of this paper is to seek Commission approval to expend additional funds from the Nuclear Waste Fund (NWF) for the completion of knowledge management activities related to the proposed high-level waste (HLW) repository at Yucca Mountain, Nevada.

In June 2008, the U.S. Department of Energy (DOE) submitted a license application seeking authorization to construct a geologic repository at Yucca Mountain. After docketing the DOE license application, the U.S. Nuclear Regulatory Commission's (NRC) technical staff began documenting its review in a Safety Evaluation Report (SER). In March 2010, DOE filed a motion to withdraw its application before the Atomic Safety and Licensing Board (ASLB). The ASLB denied DOE's motion in June 2010. On September 30, 2010, DOE's Office of Civilian Radioactive Waste Management ceased operations and assigned the remaining Yucca Mountain-related responsibilities, such as site closure, to other offices within DOE. During this time period, Congress reduced funding for the NRC's HLW Program. In October 2010, the NRC staff began orderly closure of its Yucca Mountain activities. In September 2011, the Commission announced it was evenly divided on whether to overturn or uphold the ASLB's decision denying DOE's motion to withdraw its application.

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The Commission directed the Board, in recognition of budgetary limitations, to complete all necessary and appropriate case management activities, and the Board suspended the proceeding on September 30, 2011. On August 13, 2013, the U.S. Court of Appeals for the District of Columbia Circuit issued a decision granting a writ of mandamus, and directing the NRC to resume the licensing process.

The NRC has not received appropriations from the NWF since Fiscal Year (FY) 2011. Since 2011, remaining funds from the prior-year NWF appropriations have been used for certain activities related to a potential repository at Yucca Mountain, Nevada.

For example, the staff completed and published the following documentation of its review for Yucca Mountain: the Technical Evaluation Report (published in 2011), the SER (final volume published in 2015),<sup>1</sup> and the supplement to DOE's environmental impact statement (published in 2016).<sup>2</sup> In addition, in 2016, the nearly 3.7 million documents formerly available in the Licensing Support Network were made publicly available in the Agencywide Documents Access and Management System (ADAMS).<sup>3</sup> The staff also conducted two separate knowledge management activities to document information that would position the agency well in the event that the Yucca Mountain repository licensing proceeding is resumed, or for potential NRC licensing of another geologic repository.

The first knowledge management activity was initiated as part of the NRC's orderly closure of its Yucca Mountain review activities in FY 2011. The staff produced a set of knowledge management reports that covered topics related to the review of the license application, such as pre- and post-closure safety, performance assessment, the regional and local geologic framework, disruptive events, and barrier performance. A second knowledge management activity, conducted after the publication of the SER, was approved by the Commission<sup>4</sup> to document insights gained in selected technical areas, including new approaches or understanding in the specific fields of pre- and post-closure safety assessment, and climate and hydrologic processes.<sup>5</sup>

Beginning in October 2013, the NRC has provided monthly reports to Congress on its activities and the NRC's expenditures of funds from prior-year NWF appropriations. The total unobligated NWF funds remaining, as of May 31, 2020, are \$421,705. The only further NWF expenditures currently planned are the costs of preparing the monthly report to Congress, which currently averages \$500 per month.

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<sup>1</sup> Staff Requirements M131118, SECY-13-113 – Memorandum and Order Concerning Resumption of the Yucca Mountain Licensing Process, November 18, 2013; NUREG-1949, "Safety Evaluation Report Related to Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada."

<sup>2</sup> Staff Requirements – COMSECY-14-0041, Yucca Mountain Project Activities, February 3, 2015; NUREG-2184, "Supplement to the U.S. Department of Energy's Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nevada."

<sup>3</sup> SECY-16-0122, Status of Yucca Mountain Repository Program Activities, October 19, 2016, at 2.

<sup>4</sup> Staff Requirements – SECY-16-0122, Status of Yucca Mountain Repository Program Activities, November 8, 2016.

<sup>5</sup> Examples of knowledge management documents are Passivity of Alloy 22 (ADAMS Accession No. ML17192A415) and Seismic Site Response (ADAMS Accession No. ML17192A405).

**DISCUSSION:**

Since the Yucca Mountain licensing proceeding was suspended in 2011, the technical staff available to support any effort on geological disposal has changed. Most of the NRC's senior technical staff who participated in the Yucca Mountain licensing review in the period from 2008 to 2011, and from 2013 to 2016, have retired or otherwise left the agency. Many of these technical staff had 15 to 20 years of experience with the Yucca Mountain project. The Center for Nuclear Waste Regulatory Analyses (CNWRA), which provides technical support for the HLW program, has also seen significant technical staff attrition over the last 10 years. It can be expected that, within the next few years, remaining key NRC and CNWRA technical staff will no longer be available to support the licensing proceeding, should the agency receive funds to restart these activities.

For this reason, the staff is recommending that NWF resources be utilized to produce a knowledge management document to assist the technical staff in its preparation for its participation in the licensing proceeding should the agency receive funding in the future to resume that proceeding. Although a large body of information exists on the regulatory and technical progress and findings since the 1980s, a knowledge management document that identifies and connects with the regulatory and technical review information previously documented would improve the efficiency in reconstituting the technical knowledge that will be necessary if the technical staff is called upon as a party to the adjudication on the DOE application. This document would be especially useful for those technical staff with little to no experience with the technical review for Yucca Mountain who may serve as witnesses in the adjudication. It would also benefit potential technical support to the NRC Solicitor in litigating any legal challenges to the standards and regulations that were utilized as the basis for the technical staff's work on the SER, as well as to any decision on the merits regarding the licensing of a repository.

Previous knowledge management activities were conducted to share technical information relevant to the Yucca Mountain review. The new knowledge management activity proposed in this paper would be focused on the technical and regulatory bases related to the review of the license application (e.g., technical information used to support the specification of the infiltration rate to be used for the period after 10,000 years as specified at Title 10 of the *Code of Federal Regulations* Part 63.342). The staff proposes development of a "roadmap" that identifies key technical documents, highlighting the relationship of the technical documents and the relevant regulatory topic and/or technical review, and providing additional descriptive or background material related to the technical documentation, as appropriate. It is expected that the decrease in key technical staff with Yucca Mountain experience may make reconstitution of a staff team to support the licensing proceeding more difficult. This detailed roadmap would assist the technical staff navigating through the thousands of existing technical documents related to the regulatory requirements and safety review, and is expected to reduce the time needed for individual technical staff preparations.

The enclosure provides further details on this knowledge management activity along with cost estimates for the two tasks: consideration of the technical documents relevant to the regulatory framework and consideration of the technical documentation relevant to the technical review.

**RECOMMENDATION:**

The staff recommends that the Commission approve the staff's proposal to develop a roadmap for the use of technical documentation relevant to the Yucca Mountain review that includes the regulatory framework and technical review using the NWF appropriations in an amount provided in Enclosure 1. The development of this roadmap would assist the technical staff in any preparations for timely support for the national HLW disposal program. The expected remaining balance of the NRC's NWF funds would be available for other purposes, including preparing monthly reports to Congress.

The staff intends to complete the knowledge management documents in no more than 1 year following a Commission decision directing staff to conduct knowledge management activities using the NWF. The Office of the General Counsel has reviewed this package and has no legal objection. The Office of the Chief Financial Officer has reviewed this package and concurs with the financial information. This package has also been coordinated with the ASLB Panel relative to the anticipated utilization of remaining agency HLW carry-over funding.

SECY, please track.

Enclosure:  
Proposed Knowledge Management Activity  
(Roadmap for Use of Technical  
Documentation)

SUBJECT: KNOWLEDGE MANAGEMENT FOR HIGH-LEVEL WASTE DISPOSAL,  
DATED AUGUST 13, 2020

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**ADAMS Accession No.:** ML20147A011 (Pkg.)

**\*Concurrence via e-mail**

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