

ISSUE RESOLUTION PROCESS: YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

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ABSTRACT

The U.S. Department of Energy (DOE) has a structured process for resolving issues. First, a Steering Group, composed of licensing managers and staff from the DOE and the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O), approve issues for resolution. A working group of regulatory and technical specialists is formed for each issue to oversee its resolution. The working group defines the issue in detail and prepares an action plan. The action plan is approved by the Steering Group. DOE management then allocates the resources to complete the actions. Actions can include specific field or laboratory studies, peer reviews, meetings with the U.S. Nuclear Regulatory Commission (NRC) or other oversight groups, preparation of technical reports, or preparation of licensing documentation.

The result of an action plan is the formulation and documentation of a DOE position and the presentation of that position to the NRC staff. There are many tools available by which DOE can present its position to the NRC staff: 1) management or technical meetings; 2) technical exchanges; 3) letters; 4) topical reports; 5) petitions for rulemaking; and 6) the annotated outline for a potential license application.

Examples of issues which were worked in 1992 include: 1) the potentially adverse condition of extreme erosion; 2) volcanism; 3) seismic hazard analyses and design criteria; and 4) the origin of calcite-silica deposits.

INTRODUCTION

The Nuclear Waste Policy Act of 1982, as amended (1), charged the DOE with responsibility to site, license, develop, operate, and close a geologic repository. This involves formal interactions with the NRC, the focus of which is the resolution of licensing issues.

DOE is conducting several years of site characterization to determine the suitability of the Yucca Mountain site for a geologic repository. If suitable, DOE will apply to the NRC for a license to construct a repository. The target date for the license application is 2001.

To facilitate the licensing process, regulatory and technical issues need to be identified and resolved as early as possible, prior to submittal of the license application. A preliminary description of an issue resolution process was described in the Site Characterization Plan (SCP) issued in 1988 (2). Efforts are underway to further refine the process and to resolve issues.

ISSUE RESOLUTION PROCESS

A licensing issue is any regulatory concern with technical and/or programmatic impacts that must be resolved through research, position development, and presentation to the NRC staff to allow the geologic repository licensing process to move forward. Some of these issues have been identified in Section 8.2 of the SCP; others have been identified by outside parties, such as the NRC staff and the State of Nevada. Issue resolution is the process of interaction or negotiation between the DOE and the NRC staff regarding technical or programmatic concerns involving the implementation of regulatory requirements. In the strictest sense, issue resolution will not officially

occur until the NRC grants the DOE a repository license. However, things can be done now to expedite such resolution.

There are many ways by which the DOE can present its position on an issue to the NRC staff for the purpose of resolution: 1) meetings; 2) letters; 3) license application annotated outline submittals; 4) topical reports; and 5) petitions for rulemaking.

This paper focuses on the topical report and the process used by DOE to prepare one.

A topical report is a document that: 1) describes a methodology or approach that DOE plans to use to gather data or demonstrate compliance with regulations; 2) publishes data gathered and analyses performed during site characterization; 3) presents DOE's position that it has demonstrated compliance with some part of the regulations; or 4) a combination of the above.

The use of topical reports has ample precedent in the nuclear industry. The process is expected to work as follows (3):

1. The DOE develops the scope of the issue in detail. This includes development of the strategy or focus of the topical report.
2. The DOE prepares an outline of the topical report and compiles existing information and data to develop the technical basis for the position. An internal preliminary draft report may be prepared at this time.
3. The DOE meets with the NRC staff to discuss the technical basis for the position in order to obtain some early feedback prior to finalizing the topical report.
4. The DOE prepares the topical report on the issue. After all internal technical, peer, or management

reviews are done, the DOE submits the report to the NRC staff for review.

5. The NRC staff reviews the topical report and either provides comments to the DOE or accepts the report. If comments are provided, a meeting may be held to discuss the comments and then the topical report would be revised, as needed, and resubmitted to the NRC staff. This part of the issue resolution process is critical in that, in order for this process to work effectively, the number of NRC staff review cycles should be kept to a minimum.
6. Once the NRC staff is satisfied with the DOE position in the topical report, it can accept the report, which could later be incorporated by reference in a license application if one is submitted. In the meantime, the DOE will incorporate the accepted report in the license application annotated outline in order to provide future license application preparers with that information. Historically, the NRC staff has accepted topical reports in several ways, four of which are identified below:
 - a. Safety Evaluation Report - This is a report that the NRC staff has used in the past for documenting their review and acceptance of topical reports in the reactor industry.
 - b. NUREG - The NRC staff could incorporate the DOE topical report in a staff technical position, which would be issued as a NUREG document.
 - c. Regulatory Guide - The topical report could also be incorporated in a regulatory guide, which traditionally has carried more weight than a NUREG in a licensing proceeding.
 - d. Rulemaking - If the DOE position requires a change in the NRC regulations, a rulemaking could be initiated in accordance with 10 CFR Part 2 (4), either by NRC's own initiative or by a petition for rulemaking from an outside party (such as the DOE).

Of the four options listed above for NRC staff acceptance of a topical report, rulemaking is the most definitive and legally binding on the NRC. However, since rulemaking is a rather rigorous and time-consuming process, there are certain criteria that should be considered when determining the need for rulemaking. If any of the four situations identified below exists, then rulemaking would be recommended:

1. There is a gap in the regulation that needs to be filled; that is, a certain provision needed for the NRC to make its licensing findings is missing.
2. The regulation is ambiguous and the rulemaking record is inadequate to support a definitive interpretation by the NRC General Counsel.
3. The regulation is inappropriate or outdated when the present state of knowledge is taken into account.
4. The regulation is unduly burdensome, that is, it imposes excessive requirements on the applicant without any appreciable increase in the protection of the health and safety of the public or workers (5).

ISSUE RESOLUTION ORGANIZATION

Issue resolution is a regulatory function. It is a joint responsibility. The DOE Office of Systems and Compliance

(OSC) within the Office of Civilian Radioactive Waste Management provides regulatory oversight and is the point of contact with the NRC. The Office of Geologic Disposal (OGD) provides regulatory and technical expertise related to Yucca Mountain. The CRWMS M&O contractor provides licensing and technical support. The U.S. Geological Survey and national laboratories provide technical input. Regulatory managers from OSC, OGD, and the CRWMS M&O constitute the Steering Group.

A working group is formed for each issue. Its objectives are: 1) to refine the definition of the issue; 2) propose the method of resolution and define resources and schedule; 3) prepare documentation; and 4) interact with NRC. The working group consists of regulatory and technical experts, who are in the best position to coordinate resolution efforts and make recommendations to the Steering Group.

THE TOPICAL REPORT

The first topical report prepared by DOE addresses 10 CFR 60.122(c)(16) (6), extreme erosion during the Quaternary. It documents the DOE position that this potentially adverse condition is not present at Yucca Mountain.

This report illustrates well the issue resolution process. The Steering Group identified extreme erosion as a likely candidate for resolution in the summer of 1991. A working group, which was formed later that year, drafted an action plan that was approved by DOE management.

The working group: 1) drafted an annotated outline for the topical report; 2) met with NRC staff in May 1992 to discuss extreme erosion and the issue resolution process; 3) qualified existing data in accordance with NUREG-1298 (7) that would be used to support DOE's position; 4) coordinated submittal of scientific data, notebooks, and reports to the DOE records center; and 5) prepared the topical report and submitted it for DOE review and approval.

The report is scheduled to be submitted to the NRC in February 1993. The working group will remain in effect until NRC comments have been resolved. The topical report will be incorporated into the draft annotated outline for a potential license application (8).

OTHER ISSUES

In addition to extreme erosion, working groups are addressing seven other issues:

1. Open Items from the NRC Site Characterization Analysis (SCA) - 117 comments and questions require additional analysis and documentation before DOE and NRC can agree to close the open items.
2. Origin of Calcite-Silica Deposits - The origin of calcite-silica deposits in the Yucca Mountain region has been a source of considerable debate. Much information related to the origin of these deposits in Trench 14 and at Busted Butte has been collected during the last three years. Detailed mapping and sampling projects have resulted in various types of data, including stable isotope, radiogenic isotope, geochronologic, paleontologic, mineralogic, and petrologic. A technical report has been prepared which provides a single location for the presentation of this information, including the data, interpretations, and conclusions. This report is in a form which is suitable for review by the

NRC staff and for reference in a potential license application.

3. **Volcanism** - The issue resolution goals are to identify NRC concerns regarding probability calculations for basaltic volcanism and to reach a common understanding regarding the approach that will be used for licensing to describe the probability of basaltic volcanism disrupting the potential repository. NRC staff concerns contained in the SCA regarding the volcanism program have been identified and will be addressed by this working group. A technical exchange was held to discuss NRC comments on a volcanism study plan. The study plan is currently in revision, and the clarification of concerns provided at the technical exchange was very helpful in ensuring that the revision will adequately address those concerns. The approach taken by the working group includes an open discussion of technical issues involved at numerous meetings and technical exchanges, as well as preparation of interim reports, culminating in the preparation of a topical report, which will include a compilation of qualified supporting data.
4. **Seismic Design Criteria** - Recent earthquakes in southern Nevada and California have focused attention on the seismic studies at Yucca Mountain. The working group has prepared an action plan reflecting the decision to accelerate the seismic program studies presented in the SCP and study plans. The working group will review and evaluate NRC staff technical positions for impacts to the DOE site characterization program, as well as the American Society of Civil Engineers' proposed guidelines for methodologies to determine seismic design criteria for repository surface and subsurface facilities. In addition, DOE plans to submit narrowly focused topical reports related to sub-issues of seismic hazards/seismic design to address and resolve NRC open items. It is believed that this approach will also assist DOE in prioritization of activities related to seismic design.
5. **Boundary of the Engineered Barrier System (EBS)** - the NRC definition of the EBS includes the underground facility. There have been past discussions between the DOE and NRC regarding the extent to which the host rock should be included as part of this boundary. Because the issue of whether the host rock is part of the EBS affects compliance with various provisions of the regulations, it is important that the extent of this boundary be resolved.
6. **Substantially Complete Containment** - 10 CFR Part 60 requires that containment of high-level waste within the waste packages be substantially complete for a specified minimum time period range. Neither the regulation nor the rulemaking record specify what will be used as the measure of compliance for this requirement. To understand and address compliance with this

requirement, substantially complete needs to be further defined. Resolution of this issue is important to the waste package design and performance assessment efforts.

7. **Pre-Waste-Emplacement Ground-Water Travel Time** - 10 CFR Part 60 requires that the pre-waste-emplacment ground-water travel time (GWTT) along the fastest path of likely radionuclide travel from the disturbed zone to the accessible environment be greater than 1,000 years. The current regulation is confusing in that it contains terms such as "disturbed zone," "fastest path," and "likely radionuclide travel" with no clear regulatory precedent and somewhat ambiguous possible interpretations. These terms need to be defined. The measure to be used for this requirement, as well as the manner in which the flow through the repository should be expressed, also need to be addressed.

Issue resolution is a dynamic process. As these first issues are resolved, others will be addressed in a similar manner.

CONCLUSIONS

The issue resolution process is operational. It allows DOE to focus resources and document its position on topics that contribute to successful siting and licensing of a geologic repository. The process is in place and is proving to be a useful and constructive management tool.

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