

**COMPLIANCE DETERMINATION STRATEGY**  
**RRT 7.8 IDENTIFICATION OF OPERATING CONTROLS AND LIMITS**

**APPLICABLE REGULATORY REQUIREMENTS:**

10 CFR 60.21(c)(3)  
10 CFR 60.21(c)(6)  
10 CFR 60.21(c)(7)  
10 CFR 60.43(a)  
10 CFR 60.43(b)

**TYPES OF REVIEW:**

Acceptance Review (Type 1)  
Safety Review (Type 3)

**RATIONALE FOR TYPES OF REVIEW:**

**Acceptance Review (Type 1) Rationale:**

This regulatory requirement topic is considered to be license application-related because, as specified in the license application content requirements of 10 CFR 60.21(c) and the regulatory guide "Format and Content for the License Application for the High-Level Waste Repository (FCRG)," it must be addressed by the U.S. Department of Energy (DOE) in its license application. Therefore, the staff will conduct an Acceptance Review of the license application for this regulatory requirement topic.

**Safety Review (Type 3) Rationale:**

This regulatory requirement topic is considered to be related to radiological safety, waste isolation, and waste retrievability. It is a requirement for which compliance is necessary to make a safety determination for construction authorization as defined in 10 CFR 60.31(a) (i.e., regulatory requirements in Subparts E, G, H, and I). It concerns the identification of probable operating controls and limits necessary for geologic repository operations that are required to be included in the license for construction authorization. Any operating controls and limits would define the restrictions within which all pre-closure repository activities must be performed; such restrictions would include but not be limited to the rate of waste receipt, discharges of radioactive materials from anticipated operations, etc. Understanding what DOE's proposed operating controls and limits are is intended to lead to a determination that the high-level radioactive waste will be received, handled, stored, and retrieved, if necessary, in a manner that assures public health and safety. Therefore, the staff will conduct a Safety Review of the license application to determine compliance with this regulatory requirement topic.

There appears to be no lack of certitude as to the methodology needed to determine or demonstrate compliance with this regulatory requirement topic. Factors considered in making this determination are based on the knowledge that technology exists to identify, justify, and review those activities, variables, or other technical specifications which are determined to be probable operating controls and limits. The technology for identifying necessary operating controls and limits to protect public health and safety is considered available because of past and current experience in similar nuclear operations. Therefore,

based on identification of and justification for operating controls and limits, the type of review will be limited to a Safety Review.

## **REVIEW STRATEGY:**

### **Acceptance Review:**

In conducting the Acceptance Review of the identification and justification of proposed operating controls and limits for geologic repository activities, the reviewer should determine if the information presented in the license application and its references for demonstrating compliance with the applicable regulatory requirements is complete. The reviewer should determine whether all appropriate information necessary for the staff to review the identified operating controls and limits is presented in a manner which would support a determination of whether there is reasonable assurance that the geologic repository can be operated in a manner that assures public health and safety.

The reviewer should determine whether the information presented in the license application is presented in such a manner that the assumptions, data, and logic leading to a demonstration of compliance with the applicable regulatory requirements are clear and do not require the reviewer to conduct extensive analyses or literature searches. The reviewer should also determine that controversial information and appropriate alternative interpretations have been adequately described and considered.

Finally, the reviewer should determine if DOE has either resolved all the NRC staff objections related to the applicable regulatory requirements, or provided all the information requested in Section 1.6.2 of the FCRG for unresolved objections. The reviewer should evaluate the effects of any unresolved objections, both individually and in combination with others, on: (1) the reviewer's ability to conduct a meaningful and timely review; and (2) the Commission's ability to make a decision regarding construction authorization within the three-year statutory period.

### **Safety Review:**

The purpose of this section of the license application is to identify those geologic repository operations, activities, and/or technical specifications which are determined to be subject to controls and limits, and to justify their selection. It focuses on the evaluation of DOE's proposed recommendation regarding the controls and limits to be placed on all pre-closure activities (waste receipt, waste emplacement, anticipated discharges of radioactive materials, etc.) that can be expected to take place on a routine basis (daily, weekly, or annually) that might affect public (including workers) health and safety at the geologic repository operations area (GROA). This information should be derived from the assessments presented and the conclusions reached by DOE in other sections of the license application. It is not concerned with the evaluation of license specifications or specific design criteria necessary for the conduct of geologic repository operations that might be proposed by DOE. The review of these and other related topics will be covered in other sections of the license application and their attendant review plans. The specific aspects of the license application on which the reviewer will focus are discussed below, and the Acceptance Criteria are identified in Section 3.0 of this Review Plan.

In conducting the Safety Review, the reviewer will, at a minimum, assess the adequacy and completeness of the data and analyses presented in the license application to support DOE's recommendations regarding identification of operating controls and limits at the GROA. Specifically, DOE will need to provide information to demonstrate the basis for selecting those activities or other items which govern geologic

repository operations that may be subject to some form of control and/or limitation. Those activities or other items include but are not limited to the following: (1) start-up and testing; (2) waste receipt; (3) temporary waste storage; (4) waste transfer; (5) waste emplacement; (6) routine GROA maintenance; (7) routine GROA inspection and testing; (8) the discharges of radioactive materials from all anticipated operations and routine activities to assure releases are within permitted limits; and (9) radiological exposures as a result of normal and anticipated operations that affect the concentration and exposure limits specified in 10 CFR Part 20, and other related standards. In addition to the activities described above, DOE's proposed operating controls and limits should also consider maintenance, surveillance, and periodic testing of all structures, systems, and components important to safety as well as those important to waste retrievability.

The reviewer should determine whether operating controls and limits proposed are derived from analyses and evaluations that include all aspects of repository operations that are important to safety, retrievability, and waste isolation. If all geologic repository activities are performed within the proposed operating limits and are maintained using the controls described in this section of the license application, the reviewer should be able to conclude that the high-level radioactive waste (HLW) will be received, handled, and stored in a manner that will comply with NRC's regulations concerning radiological safety, and thus assure public health and safety (including the health and safety of operating personnel).

The information contained in Section 7.8 of the license application will be compared with the assumptions and conclusions reached by the Compliance Reviews of those license application sections listed in Table 7.8-1. (Those sections of the license application which will support these Compliance Reviews are listed in Table 7.8-1). DOE's proposed operating controls and limits may need to be amended following the Compliance Reviews of other sections of the license application, but the staff's recommendation on the nature of the amendment may be deferred until those other reviews are complete.

In order to conduct an effective review, the reviewer will rely on staff expertise and independently acquired knowledge, information, and data in addition to that provided by DOE in its license application. For example, the reviewer should have knowledge and experience in evaluating the operations of other types of nuclear facilities. The reviewer should also be able to identify those variables that may significantly influence the final design of the GROA (e.g., the rate of receipt and total inventory in surface storage that can impact the source term for a potential release and for worker exposures) and thus, controls and limits for GROA operations. The reviewer should focus on additional data which can refine knowledge of the facility design and operations related to scheduling. The reviewer should perform, as necessary, any reviews needed to confirm the adequacy of the methodologies proposed to assure whether DOE's proposed operating controls and limits will assure public (including workers) health and safety. Also, the reviewer should have available specific documents (reports, planning documents, and procedures) bearing on this topic, that were commissioned by NRC, DOE, and others. These documents should be available to the reviewers in anticipation of the license application submittal and review. It is incumbent upon the reviewer to have acquired a body of knowledge regarding these and other critical considerations in anticipation of conducting the review to assure whether DOE's GROA design program is sufficient in scope and depth to provide the information to resolve the concerns.

Finally, as noted above, the Safety Review of DOE's proposed operating controls and limits for the GROA cannot be wholly separated from the Safety Reviews of other aspects of the geologic repository activity, considered in other sections of the license application. For example, the reviewer should confirm a correlation of the operating controls and limits to the presentation of the detailed operational schedules discussed in Section 7.7 of the license application (see "Schedules for Operations"). Therefore,

the review of the acceptability of DOE's proposed controls and limits for geologic repository operations in Section 7.8 will not be complete until assessments are made whether the overall design and plan for receiving, handling, and storing HLW can assure public health and safety. Thus, the information to be reviewed in this review plan may be cross-referenced to information and analyses related to other review plans. If it is determined that the conclusions reached by the Compliance Reviews of those sections of the license application listed in Table 7.8-1 are inadequate to support the Safety Review called for in this section of the license application, then additional clarification will be requested from DOE.<sup>1</sup>

**RATIONALE FOR REVIEW STRATEGY:**

Not applicable.

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**APPLICABLE REGULATORY REQUIREMENTS FOR EACH TYPE OF REVIEW:**

Type 1:

10 CFR 60.21(c)(3)  
10 CFR 60.21(c)(6)  
10 CFR 60.21(c)(7)  
10 CFR 60.43(a)  
10 CFR 60.43(b)

Type 3:

10 CFR 60.43(a)  
10 CFR 60.43(b)

**REFERENCES:**

Nuclear Regulatory Commission, "Format and Content For the License Application for the High-Level Waste Repository," Office of Nuclear Regulatory Research. [Refer to the "Products List" for the Division of High-Level Waste Management to identify the most current edition in effect.]

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<sup>1</sup> It should be noted that assessments of the performance confirmation program may identify deviations from the original design baseline. Analysis of the implications of any changes from the original design and/or anticipated performance will be treated in Section 8.5 ("Analysis of Changes from the Performance Confirmation Baseline") of the license application and its attendant review plan, and the recommendations for modification to existing operating controls and limits discussed there.

TABLE 7.8-1: Sections of the License Application Which Support the Safety Review of the "Operating Controls and Limits" Section of the License Application.

<i>License Application Section</i>	<i>Section Title</i>
<b>Design Criteria</b>	
4.2	Assessment of Compliance with Design Criteria for Surface Facilities
4.3	Assessment of Compliance with Design Criteria for Shafts and Ramps
4.4	Assessment of Compliance with Design Criteria for the Underground Facility
5.2	Assessment of Compliance with the Design Criteria for the Waste Package and its Components
5.3	Assessment of Compliance with the Design Criteria for the Post-Closure Features of the Underground Facility
5.5	Radiation Protection for Engineered Barrier Systems
<b>Repository Operations</b>	
7.1	Plans for Conduct of Normal Activities
7.2	Description of Radiation Protection Program
7.3	Organizational Structure, Management, and Administrative Controls
7.4	Procedure Development
7.5	Records and Reports
7.6	Training Programs
7.7	Schedules for Operations
<b>Performance Objectives</b>	
4.5	Assessment of Integrated GROA Compliance with the Performance Objectives:
4.5.1	Protection against Radiation Exposures and Releases of Radioactive Material to Individual Members of the Public
4.5.2	Retrievability of Waste
<b>Performance Confirmation</b>	
8.2	Performance Confirmation Program for Structures, Systems, and Components of the GROA
8.4	Radiation Protection during Performance Confirmation
8.5	Analysis of Changes from Performance Confirmation Baseline
<b>Other</b>	
2.6	License Specifications
10.0	Quality Assurance