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AUG 25 1989

Mr. Ralph Stein, Associate Director for
Systems Integration and Regulations
Office of Civilian Radioactive Waste Management
U. S. Department of Energy, RW-24
Washington, D.C. 20545

Dear Mr. Stein:

SUBJECT: TABLE OF CONTENTS FOR THE FORMAT AND CONTENT REGULATORY GUIDE FOR
THE LICENSE APPLICATION FOR THE HIGH-LEVEL WASTE REPOSITORY

By letter dated February 22 1989, the U.S. Department of Energy (DOE) provided the Nuclear Regulatory Commission (NRC) with an informational copy of its proposed Table of Contents (TOC) for the High-Level Waste Repository Safety Analysis Report (SAR). Although the NRC staff does not intend to review this document, it has been considered in the staff's development of its "Format and Content Regulatory Guide for the License Application for the High-Level Waste Repository" (FCRG). Because the staff's approach differs significantly from the DOE SAR TOC, I am forwarding the staff's proposed FCRG TOC to you for your information. While I am not requesting comments from DOE at this time, I would be happy to meet with you to discuss this TOC and our approach to the FCRG. The expected publication date of a draft FCRG in the Federal Register for comment by all interested parties is December 1989.

The staff has chosen a repository systems based approach for the FCRG. This approach involves identifying the major systems in the repository block. Each major system is then broken down into subsystems, and/or structures and components. This TOC only provides a structured breakdown that covers the major subsystems within the systems. The completed draft FCRG will go into one or more additional levels of detail, as appropriate. At these levels, the FCRG will cover the subsystems, structures and components, as well as describe the types of information to be provided in each section. A repository systems based approach was chosen after consideration of several alternatives. It should eliminate repetition of material by allowing for discussion of information in the context of the information's relevance to a particular system, rather than a general "data dump" which then must be sorted and repackaged by the reviewers in order to assess each system's compliance with the the pertinent regulations. This repository systems approach also ensures that subsystems, structures and components will not be considered in isolation, but rather as integrated parts of the systems within which they function. In this way, the FCRG will identify the kinds of information needs usually found in

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format and content guides. Thus, the FCRG is structured such that the information needs identified for each system, subsystem, structure and component are based upon the information which must be provided to demonstrate compliance with all of the regulations applicable to that system, subsystem, structure, or component. For example, the sections of the FCRG covering the waste package subsystem of the Engineered Barrier System would identify the information needed to demonstrate compliance with the following requirements from Part 60 of Chapter 10 of the Code of Federal Regulations (10 CFR Part 60): 60.21(c)(1), 60.21(c)(2), 60.21(c)(5), 60.21(c)(14), 60.113(a)(1)(ii)(A), and 60.135. A matrix depicting the applicability of the various 10 CFR Part 60 requirements to each of the systems contained in the FCRG will be included as an Appendix of the FCRG.

I hope that you will find this information useful. If you have any questions please feel free to contact the FCRG Project Manager, Mark Delligatti. Mr. Delligatti can be reached at FTS 492-0430 or (301) 492-0430.

Sincerely,

JS

John J. Linehan, Director
Repository Licensing and Quality
Assurance Project Directorate
Division of High-Level Waste Management

Enclosure: As Stated

cc: C. Gertz, DOE/NV
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REPOSITORY SYSTEM BASED FORMAT AND CONTENT GUIDE

A. Background Information

1. Purpose of the Regulatory Guide
2. Applicability of the Regulatory Guide
3. Use of the Regulatory Guide
4. Style and Composition
5. Revisions
6. Physical Specifications
7. Licensing Support System

B. License Application*

For each major heading below, regulatory requirements from 10 CFR 60 shall be listed. Compliance with each regulatory requirement must be demonstrated each time the requirement appears. Appendix A of the Format and Content Guide will provide a matrix depicting the applicability of all regulatory requirements to the sections of the Guide.

1. General Information

- 1.1 Information about the repository program, including site characterization, location, repository description, etc.
- 1.2 Schedules
- 1.3 Safeguards Certification/Physical Security Plan
- 1.4 Identification of Probable Subjects for License Specifications
- 1.5 Description of Site Characterization Work Completed
- 1.6 Status of DOE Resolution of NRC Concerns

Contents of Safety Analysis Report

2. The Natural Systems of the Geologic Setting

The description and assessment of the natural systems of the geologic setting should describe both the site and the geologic setting and shall include a statement of the overall purpose and function of the repository site and how the site fulfills the requirements of 10CFR60. The focus of the descriptions and assessments is the function of each system and subsystem in the isolation of high-level radioactive waste from the accessible environment.

* According to 10 CFR Part 60.21(a), an environmental impact statement must accompany the license application for the high-level waste repository.

- 2.1.1 Geologic Subsystem
- 2.1.2 Hydrologic Subsystem
- 2.1.3 Geochemical Subsystem
- 2.1.4 Climatological/Meteorological Subsystem
- 2.1.5 Integrated Natural System Properties
- 2.2 Description of the Anticipated Processes and Events (APES) and Unanticipated Processes and Events (UPES).
- 2.3 Assessment of Compliance with 10CFR60
 - 2.3.1 Geologic Subsystem
 - 2.3.2 Hydrologic Subsystem
 - 2.3.3 Geochemical Subsystem
 - 2.3.4 Climatological/Meteorological Subsystem
 - 2.3.5 Integrated Natural System Effectiveness in meeting the Performance Objectives

3. Geologic Repository Operations Area: Physical Facilities

The description and assessment of the geologic repository operations area shall include a statement of the overall purpose and function of the geologic repository operations area and how the geologic repository operations area fulfills the requirements of 10CFR60.

- 3.1 Description and identification of structures, systems, and components, including both surface and underground facilities, and systems structures and components important to safety and waste isolation, and all other systems and other related components.
 - 3.1.1 Surface Facilities
 - 3.1.2 Shafts
 - 3.1.3 Underground Facility
 - 3.1.4 Radiation Protection
 - 3.1.5 Description of the interface of Structures, Systems, and Components
- 3.2 Assessment of Compliance with 10CFR60
 - 3.2.1 Surface Facilities
 - 3.2.2 Shafts
 - 3.2.3 Underground Facility
 - 3.2.4 Radiation Protection
 - 3.2.5 Ability of interfacing Structures, Systems, and Components to meet the Performance Objectives.

4. Engineered Barrier Systems

The description and evaluation of the engineered barrier systems shall include a statement of the overall purpose and function of the engineered barrier systems and how the engineered barrier systems fulfill the requirements of 10CFR60.

- 4.1. Descriptions of Engineered Barrier Systems and components which provide a barrier between the high-level waste and the geologic setting.
 - 4.1.1 Waste Form
 - 4.1.2 Waste Package (Design description, purpose and function, materials, alternative materials and designs considered)
 - 4.1.3 Underground Facility (general description of the underground structure including openings and backfill materials)
 - 4.1.4 Radiation Protection
- 4.2 Description of Repository Induced Phenomena
- 4.3 Assessment of Compliance with 10CFR60
 - 4.3.1 Waste Form
 - 4.3.2 Waste Package Design Requirements
 - 4.3.3 Waste Package Performance Objectives
 - 4.3.4 Engineered Barrier System Performance Objectives
 - 4.3.5 Radiation Protection

5. Overall System Performance Assessment

In demonstrating overall system performance, compliance with 40 CFR Part 191 must be shown.

- 5.1. Basic Approach
- 5.2 Models and Scenarios
 - 5.2.1 Model and Code Verification
- 5.3 Overall System Performance
 - 5.3.1 Identification and screening of processes and events.
 - 5.3.2 Scenario development and screening.
 - 5.3.3 Consequence analyses.
 - 5.3.4 Probability estimates.
 - 5.3.5 Regulatory compliance assessment.
 - 5.3.6 Evaluation of potentially adverse conditions.
 - 5.3.7 Evaluation of alternative design features.

6. Conduct of Repository Operations

- 6.1. Security and Safeguards
- 6.2. Maintenance
- 6.3. Radiation Protection
- 6.4. Organizational Structure
- 6.5. Procedure Generation Package
- 6.6. Inspections/Testing
- 6.7. Records/Reports

7. Performance Confirmation Program

Information shall be presented about the proposed Performance Confirmation Program.

- 7.1. Performance Confirmation for the Natural Systems of the Geologic Setting
 - 7.1.1 Geologic System
 - 7.1.2 Hydrologic System
 - 7.1.3 Geochemical System
 - 7.1.4 Climatological/Meteorological System
 - 7.2. Performance Confirmation for the Structures, Systems, and Components of the GROA
 - 7.2.1. Surface Facilities
 - 7.2.2 Shafts
 - 7.2.3 Underground Facility
 - 7.2.4 Radiation Protection
 - 7.3 Performance Confirmation for the Engineered Barrier Systems
 - 7.3.1 Waste Package Monitoring
 - 7.3.2 Radiation Protection
 - 7.4. Overall System Performance Confirmation
- ## 8. Permanent Closure and Decommissioning

Information to be presented to describe decommissioning and permanent closure will include:

- 8.1. Backfilling and sealing of the underground facility
- 8.2. Backfilling and sealing of shafts and ramps
- 8.3. Decontamination of equipment and facilities
- 8.4. Preservation of Records
- 8.5. Site Markers
- 8.6. Radiation Protection

- 9. Land ownership and control
 - 9.1. Plans for Restricting Controlled Area Access
 - 9.2. Plans for Regulating Land Use at the Site and Adjacent Areas.
 - 10. Quality Assurance
 - 10.1 Description of the Quality Assurance (QA) programs
 - 10.1.1 QA program applied to activities affecting quality during Site Characterization.
 - 10.1.2 QA program applied to the structures, systems and components important to safety and to the engineered and natural barriers important to waste isolation during the design and construction of the geologic repository.
 - 10.1.3 QA program for Performance Confirmation
 - 10.1.4 QA Program for Operations, Permanent Closure, Decontamination and Decommissioning.
 - 10.2 Compliance Assessment
 - 10.2.1 QA program applied to activities affecting quality during Site Characterization.
 - 10.2.2 QA program applied to the structures, systems and components important to safety and to the engineered and natural barriers important to waste isolation during the design and construction of the geologic repository.
 - 10.3.3 QA program for Performance Confirmation
 - 10.3.4 QA Program for Operations, Permanent Closure, Decontamination and Decommissioning.
 - 11. Emergency Planning
 - 11.1 Description of the Emergency Plan
 - 11.2 Compliance with the Regulatory Requirements Related to the Emergency Plan
- Appendix A Matrix of Applicability of 10 CFR Part 60 Requirements.