EPRI

Interim Storage of Greater Than Class C Low Level Waste

Technical Report

Interim Storage of Greater Than Class C Low Level Waste

1003027

Final Report, November 2001

EPRI Project Manager
S. Bushart

EPRI • 3412 Hillview Avenue, Palo Alto, California 94304 • PO Box 10412, Palo Alto, California 94303 • USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com

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CITATIONS

This report was prepared by

ERS International, Inc.
687 Cedar Forest Circle
Orlando, FL 32828

Principal Investigator
J. Kelly

This report describes research sponsored by EPRI.

The report is a corporate document that should be cited in the literature in the following manner:

Interim Storage of Greater Than Class C Low Level Waste, EPRI, Palo Alto, CA: 2001. 1003027.

REPORT SUMMARY

This report serves as a guideline for the safe, interim, on-site storage of low level radioactive waste (LLW) that exceeds the activity limitations for near-surface disposal set forth in 10 CFR 61.55. This waste, referred to as greater than Class C (GTCC) waste, exceeds the Class C limits in the referenced regulation. At the present time, there is no licensed disposal facility for GTCC waste in the US. This situation forces commercial nuclear reactors to store it on site until a disposal facility is constructed and licensed. This report reviews industry experience in dealing with the challenges of GTCC waste.

Background

Interim GTCC waste storage is allowed on a nuclear reactor site under the general license authorization of 10 CFR 50, but not under 10 CFR Part 72. This serves as a road block for decommissioning plants desiring to terminate their Part 50 license with the intent of storing GTCC waste in an independent spent fuel storage installation (ISFSI) licensed under Part 72. The NRC is in the process of revising its regulations in Part 72 to accommodate concurrent storage of GTCC waste.

This report addresses the current regulatory requirements for interim on-site storage of GTCC waste, as well as the proposed Part 72 rulemaking by the NRC. This will assist nuclear utilities currently faced with or planning for GTCC storage.

Objectives

- To provide guidance on the management of GTCC waste, to both decommissioning and operating nuclear plants which own or are planning to construct an ISFSI.
- To identify and explain the regulatory and technical issues plants must address to receive and store GTCC waste in an ISFSI.
- To provide guidance for the overall development of an on-site GTCC waste storage program within an ISFSI, including design criteria, administrative controls, and storage containers.
- To document the existing GTCC waste management and storage experiences (i.e., lessons learned) of decommissioning nuclear plants.

Approach

The project coordinator performed a comprehensive review of the applicable regulations, regulatory guidance documents, and the proposed NRC rulemaking. This information formed the technical basis for this report by providing the fundamental guidelines and comparative analyses among the various existing regulations, and the proposed rulemaking. In addition, the project team surveyed decommissioning nuclear plants to identify GTCC waste volumes, management

practices, storage plans, containerization, and lessons learned. This information served to balance the technical and regulatory issues with actual field practices.

Results

This report contains a detailed review of industry experience and lessons learned with the storage of GTCC waste. It also describes the most significant challenges in working with GTCC waste. In addition, it serves as an intermediate guideline document for any nuclear plant facing interim on-site storage of GTCC waste pending a final rulemaking by the NRC on related licensing and regulatory issues. Once the NRC publishes the final rulemaking, this report will serve as the foundation for the rapid completion of a final guideline document.

Several of the key guidance documents affecting GTCC waste storage are included as appendices to this report. The appendices also include a copy of the proposed rulemaking revising the licensing and storage of GTCC waste under 10 CFR Part 72. The entire report is extensively cross-referenced to these documents, as well as to other documents related to GTCC waste storage.

EPRI Perspective

Each utility faced with interim on-site storage of GTCC waste, whether operating or in decommissioning, will benefit from this comprehensive review of the applicable technical, licensing and regulatory considerations. EPRI will update this report after the final NRC rulemaking, as part of the next revision of the EPRI Interim On-Site Storage of LLW Guidelines.

Keywords

Greater than Class C waste
Interim on-site storage
Decommissioning

ABSTRACT

The Low-Level Radioactive Waste Policy Amendments Act of 1985 gave the Department of Energy (DOE) the primary responsibility for developing a national strategy for the disposal of greater than Class C (GTCC) waste. At the present time, the DOE intends to dispose of GTCC waste concurrently with spent nuclear fuel and high level waste and in the same disposal facility. However, such a disposal facility, the waste acceptance criteria, and the technical regulations for a disposal package of GTCC waste do not yet exist.

Thus, a need exists for interim storage for GTCC waste, as well as associated technical guidance to ensure safe storage of the waste. This report is being developed to meet that need.

ACKNOWLEDGEMENTS

This report benefits substantially from the experience and expertise of the following utility contributors (listed alphabetically according to the last name):

J. Byrne, Three Mile Island

P. Genoa, Nuclear Energy Institute (NEI)

L. Goodman, Fermi

B. Hutchins, Connecticut Yankee

M. Murdock, Trojan

M. Naughton, EPRI

K. Pallagi, Big Rock Point

P. Plante, Maine Yankee

E. Ronningen, Rancho Seco

J. P. Tarzia, HP/Chemistry Manager (Bechtel), Connecticut Yankee

G. Van Noordennen, Connecticut Yankee

G. Withrow, Big Rock Point

EDITORIAL COMMENT

Time Value of the Technical Data

As with all technical information, the regulatory requirements, disposal site criteria, and state-of-the-art practices will change over time. Every effort has been made to ensure that all technical data, regulatory requirements, disposal site criteria, etcetera, are current through October 2001. It is likely that the most dynamic issues will be those involving GTCC waste stabilization and containerization in advance of placing the waste in interim storage. It is, therefore, incumbent upon the user of this report to remain current with advancements in GTCC waste technology and regulatory requirements, particularly with regard to onsite storage requirements and MRS/disposal site waste acceptance criteria.

Recommended Approach to Using This Report

Utility executives, managers and support organizations may wish to focus initially on the material contained in the **Executive Summary** in Section 2. The balance of the report should be referred to on an as-needed basis to expand the understanding of specific regulatory or technical aspects of GTCC waste storage.

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INTRODUCTION

1.1 Background

The Low-Level Radioactive Waste Policy Amendments Act of 1985 gave the Department of Energy (DOE) the primary responsibility for developing a national strategy for the disposal of greater than Class C (GTCC) waste. At the present time, the DOE intends to dispose of GTCC waste concurrently with spent nuclear fuel and high level waste and in the same disposal facility. However, such a disposal facility does not yet exist. Taking this a step further, the DOE has not yet identified the waste acceptance criteria (including waste packaging) and the technical regulations for a disposal package of GTCC waste.

The Act also gave the NRC the licensing responsibility for a disposal facility for GTCC waste. Such a disposal facility does not yet exist; one must be developed and licensed before GTCC waste can be shipped for disposal. Thus, there exists a need for interim storage for GTCC waste, as well as associated technical and regulatory guidance to ensure safe storage of the waste.

Interim GTCC waste storage is allowed on a nuclear reactor site under the general license authorization of 10 CFR 50, but it is not currently allowed under 10 CFR Part 72. This serves as a road block for decommissioning plants desiring to terminate their Part 50 license with the intent of storing GTCC waste in an independent spent fuel storage installation (ISFSI) licensed under Part 72. The NRC is in the process of revising its regulations in Part 72 to accommodate concurrent storage of GTCC waste.

The draft version of the report addresses the current regulatory requirements for interim onsite storage of GTCC waste, as well as the Part 72 proposed rulemaking by the NRC. This will assist nuclear utilities currently faced with or planning for GTCC storage. A final version of this report will be published shortly after the final rulemaking by the NRC.

1.2 Objectives of This Report

This report is being distributed in draft form to members of EPRI's Nuclear Business Group to provide an overview of the technical and regulatory issues which would allow storage of GTCC waste at a commercial nuclear reactor site and within an ISFSI. It will also be used to capture plant experience factors and data, as well as any lessons learned. The draft report will be used as the basis for developing a final report which is expected to be published shortly after the final rulemaking by the NRC.

Currently, the report has four objectives:

1. Provide guidance on the management of GTCC waste to both decommissioning and operating nuclear plants which own or are planning to construct an ISFSI.

2. Identify and explain the regulatory and technical issues which must be addressed to receive and store GTCC waste in an ISFSI.

3. Provide guidance for the overall development of an onsite GTCC waste storage program within an ISFSI, including design criteria, administrative controls, and storage containers.

4. Document the existing GTCC waste management and storage experience (i.e., lessons learned) of decommissioning nuclear plants.

It is anticipated that the user of this report will refer to it routinely throughout the development and implementation of the GTCC waste storage program to ensure that major program components are being addressed and are being performed in a timely manner. It is further anticipated that the user will continue to refer to and utilize this report and the related EPRI storage reports as part of the routine operation of the ISFSI for GTCC waste.

1.3 Key Definitions

The definitions found in Subpart 72.3 are insufficiently comprehensive to address storage of GTCC waste in an ISFSI. In its proposed rulemaking to Part 72, the NRC has added or revised several key definitions which clarify the regulations and assist the licensee to develop and comply with technical specifications and other conditions of the operating license. Those proposed definitions are as follows:

- **"Greater than Class C waste or GTCC waste"** means low-level radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in Sec. 61.55 of this chapter.
- **"Design capacity"** means the quantity of spent fuel, high-level radioactive waste, or reactor-related GTCC waste, the maximum burn up of the spent fuel in MWD/MTU, the terabequerel (curie) content of the waste, and the total heat generation in Watts (btu/hour) that the storage installation is designed to accommodate.
- **"Independent spent fuel storage installation or ISFSI"** means a complex designed and constructed for the interim storage of spent nuclear fuel, solid reactor-related GTCC waste, and other radioactive materials associated with spent fuel and reactor-related GTCC waste storage. An ISFSI which is located on the site of another facility licensed under this part or a facility licensed under Part 50 of this chapter and which shares common utilities and services with that facility or is physically connected with that other facility may still be considered independent.
- **"Spent fuel storage cask or cask"** means all the components and systems associated with the container in which spent fuel, other radioactive materials associated with spent fuel, or reactor-related GTCC waste are stored in an ISFSI.

[Note: This definition is considered by the author of this report to be inadequate. A response to the proposed rulemaking has been submitted to the NRC to clarify this definition to bring it more in line with the existing definitions for packages and packaging, and those recommendations are under consideration.]

- **"Structures, systems, and components important to safety"** means those features of the ISFSI, MRS, and spent fuel storage cask whose functions are:

  1. To maintain the conditions required to store spent fuel, high- level radioactive waste, or reactor-related GTCC waste safely;

  2. To prevent damage to the spent fuel, the high-level radioactive waste, or reactor-related GTCC waste container during handling and storage; or

  3. To provide reasonable assurance that spent fuel, high-level radioactive waste, or reactor-related GTCC waste can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public.

2
EXECUTIVE SUMMARY

2.1 Overview

Table 2-1 summarizes the licensing authorizations for the various types of radioactive waste which may be stored at an interim spent fuel storage installation (ISFSI).

Table 2-1
Summary of Licensing Authorizations for Radioactive Waste Storage

Waste Types Stored at ISFSI	Part 50	Part 30 *	Part 70 **	Current Part 72	Proposed Part 72
Spent fuel aged >1 year	✓			✓	✓
Other materials associated with spent fuel storage (including secondary LLW)	✓	✓	✓	✓	✓
Solid GTCC waste	✓	✓	✓		✓
Liquid GTCC waste	✓	✓	✓		
Other LLW (Class A, B or C)	✓	✓	✓		

* Byproduct material ** Special nuclear material

Note: A survey of decommissioning plants suggests that there is little, if any, liquid GTCC waste which will require on site storage.

Table 2-1 makes it clear that the licensee has broad storage options under a Part 50 license. It is also clear that the licensee has multiple options if it desires to terminate its Part 50 license. Most restrictive among the various options is a site-specific license obtained under Part 72, which intentionally has a much narrower focus both now and after proposed revisions.

Nuclear plants undergoing decommissioning currently have options for permanent disposition of their LLW which is determined to be Class A, B or C. That LLW which exceeds the Class C limit for shallow land disposal (GTCC waste) has no current dispositioning option, so it must be stored on site. This waste will eventually be disposed in a national spent fuel respository managed by the DOE.

After completion of decommissioning, the only waste likely to remain on site is spent fuel, GTCC waste, and other materials associated with spent fuel storage. As indicated in Table 2-1, termination of the Part 50 license would require two and probably three licenses: Part 30, 70 and 72. Moreover, for agreement states, this could result in multiple regulatory agencies overseeing waste storage activities. These conditions represent an onerous burden on the site operator which can be alieviated via a revision to the regulations in Part 72, which is currently underway.

For those who may not be familiar with what an ISFSI looks like, Figure 2-1 was extracted from NUREG/BR-0216, *Radioactive Waste: Production, Storage, Disposal,* July 1996. The NUREG includes a discussion of spent fuel storage in an ISFSI and includes the two example illustrations.

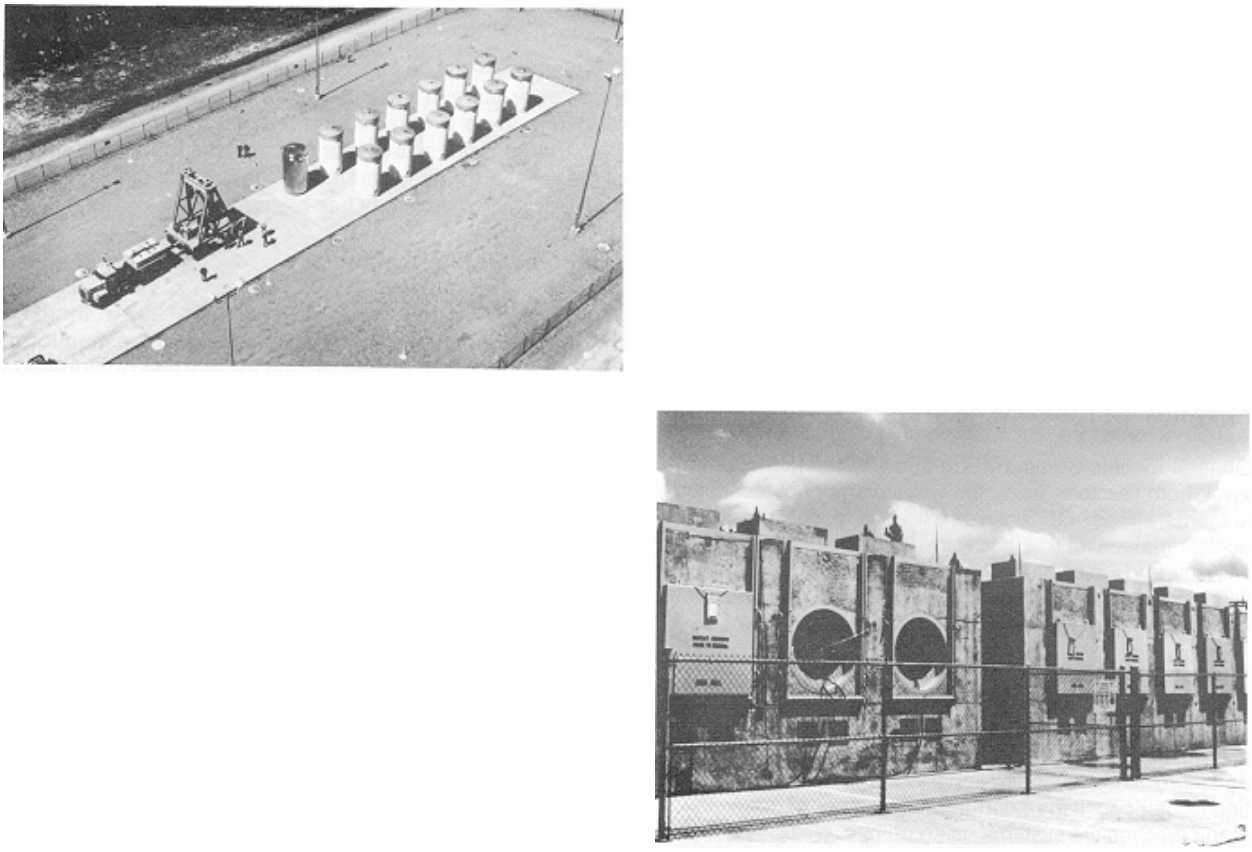

Figure 2-1
Typical Horizontal and Vertical ISFSI

Regardless of the license authorization used for the interim storage of GTCC waste, safe storage is bounded by multiple technical considerations and underscored by numerous experience factors (lessons learned). This report serves as a comprehensive review of the licensing, regulatory and technical considerations for safe storage of GTCC waste, as well as documenting important lessons learned.

2.2 Summary and Conclusions

The remainder of this chapter briefly summarizes the key concepts regarding safe storage of GTCC waste. It also includes references to the appropriate section of this report containing detailed information and discussion.

This document is being issued initially as a draft report to assist decommissioning plants in planning for long term GTCC waste management. As such, it addresses both the current regulations and the proposed rulemaking to Part 72, which is expected to be issued as final rulemaking within one year. Long range planning should include the current and projected rulemaking, as well as the uncertainties discussed herein.

2.2.1 Summary of Licensing Considerations (See Sections 3.2 and 3.3)

- The proposed rulemaking to Part 72 will allow storage of GTCC waste within the ISFSI, but they will not change the storage limitations in effect for any other type of LLW.
- Spent fuel can be stored in an ISFSI under a Part 72 license. Spent fuel is defined to include "other radioactive materials associated with fuel assemblies." Although this lacks clarity in both the current regulations and in the proposed rulemaking, efforts by NEI are underway to obtain clarification within the final rule so as to be consistent with the language for the Standard Contract (10 CFR Part 961) for disposal of spent fuel and associated non-fuel components.
- Under current regulations, and following termination of a Part 50 license, GTCC waste stored in an ISFSI located in an Agreement State would require a separate license issued by the Agreement State. Under the proposed rulemaking for Part 72, and following termination of a Part 50 license, all GTCC waste stored in an ISFSI would be stored under an NRC-issued Part 72 specific license.

2.2.2 Safety Analysis Report Inclusion Requirements (See Section 4.1)

- Prior to receiving GTCC waste, the licensee must include in its Safety Analysis Report (SAR) how the GTCC waste will be stored to prevent any potential adverse reactions. The SAR should include equipment and facility design, description of planned operations, and other information important to safe receipt, handling, packaging, storage and transfer of GTCC waste.

2.2.3 Design, Monitoring and Inspection Criteria (See Sections 4.2 through 4.5)

- The general design criteria for an ISFSI must be reviewed and satisfied for safe storage of GTCC waste prior to receiving GTCC waste. This applies for both a Part 50 and Part 72 license.
- The regulations and current guidance documents do not provide any separate design criteria for containers used to store spent fuel or GTCC waste. It is incumbent upon the user to ensure that the GTCC waste does not adversely impact on the container, the storage cask, or anything else stored in the ISFSI.

- A survey of decommissioning plants indicates that most are proceeding with the design review for GTCC waste containers using the same criteria applicable to spent fuel storage with additional consideration given to chemical, galvanic, organic or other reactions.
- A "72.48 review" should be accomplished to identify any potential unreviewed safety questions prior to making any changes, tests or experiments at an ISFSI. This should be accomplished using the same level of careful discipline applied to "50.59 reviews" for an operating nuclear plant.
- Routine monitoring and inspection requirements and associated equipment are needed for ensuring the integrity of waste containers, minimizing occupational exposures, and avoiding uncontrolled releases from an ISFSI.

2.2.4 Administrative, Reporting and Training Requirements (See Sections 5.1 through 5.3)

- Multiple reports and reporting requirements exist relative to waste storage in an ISFSI, and the proposed rulemaking to Part 72 will extend those reporting requirements to GTCC waste.
- Written accounting procedures must be established for material control and accounting (mathematical accounting) sufficient to maintain an accurate accounting of all special nuclear material (SNM) received, stored and transferred from storage. Accordingly, a physical inventory of spent fuel and GTCC waste containing SNM and stored at the ISFSI must be performed at least once every 12 months. This inventory must be documented, available for inspection, and maintained in duplicate with the duplicate records stored in a separate, remote location. The records must show the receipt, inventory (including location), disposal, acquisition and transfer of all spent fuel and GTCC waste containing SNM in storage at the ISFSI.
- A Quality Assurance program must be in place prior to receipt of spent fuel or GTCC waste at an ISFSI, and the program shall apply to both spent fuel and GTCC waste, as well as any other radioactive materials or waste stored at the ISFSI.
- A program for training, proficiency testing and certification of equipment and control operators is required prior to the receipt of spent fuel or GTCC waste at an ISFSI. This same program is required for supervisors of the equipment and control operators.

2.2.5 Acceptance and Licensing Criteria for Stored Waste Containers (See Sections 6.2 and 6.3)

- The DOE has responsibility for providing acceptance criteria for containers used to transfer GTCC waste to an MRS and for disposal of GTCC waste. The availability of written guidance providing this waste acceptance criteria is not known. The DOE has already developed several containers which could be used for this purpose and, subsequently, could be used to store GTCC waste in an ISFSI with a reduced likelihood of repackaging at the end of the storage period. However, planning needs to consider the possibility of repackaging the GTCC waste for final disposal. Such repackaging may occur at the ISFSI or at the final repository, and these considerations should be addressed as part of the long range planning.

2.2.6 Waste Forms for Interim Storage (See Sections 7.1 and 7.2)

- The proposed rulemaking to Part 72 would allow for storage at an ISFSI of solid GTCC waste only (including dewatered resin). It will prohibit storage of liquid GTCC waste within an ISFSI. Since neither of these is a certainty at the present time, nuclear plants which have GTCC resin or liquid waste may want to postpone any final waste form or waste conditioning decisions until after the final rulemaking.
- Other restrictions would be imposed on stored waste to minimize the potential for chemical, galvanic or other reactions arising from the stored GTCC waste.

3
LICENSING AND REGULATORY ISSUES

This chapter provides a review of the primary NRC regulations and guidance documents related to interim onsite storage of greater than Class C (GTCC) waste in an interim spent fuel storage installation (ISFSI). Although this report was developed primarily to support decommissioning of commercial nuclear reactors, it is recognized that both operating and decommissioning plants will seek to use their ISFSI for GTCC waste storage. Since the applicable regulations and regulatory guidance are very similar for both operating and decommissioning plants, and since plants currently storing GTCC waste under a 10 CFR Part 50 license may eventually seek to terminate their license and store GTCC waste under a Part 72 license, this report addresses both situations.

3.1 Development of Regulations and Regulatory Guidance for Onsite Storage

Before discussing specific licensing and regulatory considerations, some background should be provided on the policy and bases underlying applicable NRC requirements and guidance. The primary purpose of those requirements and guidance is to ensure that waste is stored in facilities that are designed and operated safely. This requires that each facility provides reasonable assurance that public health and safety is adequately protected and that the environment also is adequately protected. Regulations directed toward that objective can be found in:

1. 10 CFR Part 20 (e.g., regulations governing ALARA and permissible doses and concentrations in radioactive emissions and effluents; Subpart G governing signs, labels and controls; and Subpart I governing storage and control of licensed material);

2. 10 CFR Part 50 (e.g., Sections 50.34a, 50.36a and Appendix I governing design objectives and limiting conditions for operation of equipment to keep radioactive effluents ALARA; and Appendix A General Design Criteria 60, 63 and 64 governing control of releases of radioactivity to the environment and inspection, testing and monitoring of systems and release); and

3. 10 CFR Part 72 (e.g., Subpart E governing siting evaluation factors, including criteria and control of radioactive material in effluents and direct radiation from an ISFSI; Subpart F governing general storage facility design criteria; and Subpart G governing quality assurance, including inspections, measurements and testing, handling, storage and shipping controls).

These regulatory requirements are implemented and interpreted in a series of NRC Regulatory Guides, Branch Technical Positions, Generic Letters, and Standard Review Plan sections, as well as Information Notices, Bulletins and Circulars. The primary NC guidance documents governing onsite storage of GTCC are:

1 Regulatory Guide 1.143 (Rev.1, October 1979) Design Guidance for Radioactive Waste Management Systems, Structures and Components Installed in Light-Water-Cooled Nuclear Power Plants;

2 Standard Review Plan (SRP) Section 11.4, *Solid Waste Management Systems* (Rev. 2, July 1981), including:

   a) Branch Technical Position ETSB 11-3, Design Guidance for Solid Radioactive Waste Management Systems Installed in Light-Water-Cooled Nuclear Power Reactor Plants; and

   b) SRP Section 11-4, Appendix A, Design Guidance for Temporary Onsite Storage of Low Level Radioactive Waste;

3. SECY 97-056, *Interim Storage for Greater Than Class C Waste, Changes to 10 CFR Part 72* (March 5, 1997). This document was a precursor to the proposed rulemaking of June 16, 2000, *Interim Storage of Greater Than Class C Waste,* which replaces this SECY in its entirety.

4. SECY 94-198, *Review of Existing Guidance Concerning the Extended Storage of Low-Level Radioactive Waste* (August 1, 1994). A copy of the key sections of SECY 94-198 is included as an Appendix to this report. This document consolidates, clarifies, and updates all of the previous guidance relative to LLW onsite storage into a single document addressing different aspects of managing LLW after access to a licensed disposal facility is denied (or, in the case of GTCC waste, where no disposal facility exists). The original applicable guidance documents are listed below; however, the licensee should refer to SECY 94-198 to ensure that any applicable discussion and updates are understood and addressed:

   a) Generic Letter 81-38, *Storage of Low-Level Radioactive Wastes at Power Reactor Sites* (November 10, 1981), including its enclosed “Radiological Safety Guidance for Onsite Contingency Storage Capacity.” (The guidance contained in this document is similar to that contained in SRP Section 11-4, Appendix A mentioned above.)

   b) Information Notice 89-13, Alternative Waste Management Procedures In Case of Denial of Access to Low-Level Waste Disposal Sites, (February 8, 1989).

   c) Information Notice 90-09, Extended Interim Storage of Low-Level Radioactive Waste By Fuel Cycle and Materials Licensees (February 5, 1990); and

   d) IE Circular 80-18, 10 CFR 50.59 Safety Evaluations for Changes to Radioactive Waste Treatment Systems (August 22, 1980).

It also should be noted that, as of March 2001, the NRC is moving to revise 10 CFR Part 72 to provide for storage of GTCC waste at an ISFSI as part of either a general or specific Part 72 license. The proposed rulemaking is set forth in the Federal Register dated June 16, 2000, and is entitled *Interim Storage of Greater Than Class C Waste.* In addition, the NRC anticipates issuing guidance on the storage of GTCC waste under Part 72 in conjunction with issuance of the final rule.

The preceding documents describe those factors which the NRC Staff believes should be considered in evaluating the safety and environmental impacts of onsite LLW storage, including GTCC waste storage.

Note: Some administrative controls and regulations apply to all GTCC waste, whereas others apply only to GTCC waste which contains special nuclear material (SNM). Where applicable only to GTCC waste containing SNM, this is clearly identified within the related discussion. Otherwise, the requirements apply to all GTCC waste stored in an ISFSI. This is discussed further in Chapter 5.

3.2 Waste Licensed for Storage in an ISFSI

3.2.1 Storage of GTCC Waste Under a Part 50 General License

Commercial nuclear reactors with an existing Part 50 license may store GTCC waste at the site of generation under the general license provisions of the Part 50 license. This includes storage of GTCC waste on the storage pads of an ISFSI. The GTCC waste must be stored in containers separate from the spent fuel storage casks.

3.2.2 ISFSI Waste Type Storage Limitations Under a Part 72 License

The regulations in effect as of March 2001 limit the storage of waste in an ISFSI *under a site-specific Part 72 license* to two types of waste in accordance with 10 CFR Part 72.2:

1. Power reactor spent fuel aged for at least one year; and

2. Other radioactive materials associated with spent fuel storage.

Note that the key phrase in the second waste type limits non-fuel waste and radioactive materials to those which are associated with spent fuel storage. Examples might include radioactive materials used for packaging and processing, transport, inspection, measurement and testing. It would also include “secondary LLW” generated as a part of the operation of the ISFSI or as a result of any reprocessing or repackaging operations, such as smears, samples, plastic waste collection bags, and other LLW. Each of these situations links the non-fuel radioactive materials and radioactive waste to the ISFSI operation.

The regulations do not intend that secondary LLW generated as part of the operation of the ISFSI will be stored indefinitely at the ISFSI pending shipment of all fuel and final decommissioning of the ISFSI. Reference 10 CFR Part 72.128.) Although such wastes may be staged and stored in a safe manner pending characterization and accumulation of reasonable quantities to support a normal waste shipment, once these conditions have been met, the LLW should be shipped for volume reduction and/or disposal, assuming the waste generator has a LLW disposal option.

Although GTCC waste is a subclassification of LLW, GTCC waste would not normally be generated as a secondary waste during the operation of the ISFSI. In addition, the regulations do not currently allow for the interim storage of any other GTCC waste in an ISFSI (i.e., GTCC waste not generated as part of ISFSI operation).

The proposed rulemaking of June 16, 2000, for Part 72 would extend the authorization for the storage of selected wastes in an ISFSI to include GTCC waste. It is intended that this would be applicable to both the general and specific licensing authorizations. However, the proposed rule would not allow for interim storage of any other LLW in the ISFSI (except for secondary LLW as discussed above).[1]

3.2.3 Limitations on Physical and Chemical Form of Waste

Spent fuel is stored in a physical form which is reasonably well defined and for which each applicable ISFSI has been or will be designed. The storage of GTCC waste cannot be considered without recognizing alternative waste forms, specifically solid wastes, solidified wastes, and wet wastes (including resin, filters and liquids). Some organic GTCC wastes may generate or release gases, whereas other GTCC wastes may be explosive, pyrophoric, combustible, corrosive, or otherwise chemically reactive.

Thus, extending the regulations in Part 72 to embrace the storage of GTCC wastes in an ISFSI must take into consideration these potential physical and chemical impacts. Moreover, commingling of some GTCC wastes and spent fuel within the same container may decrease the margin of safety, thereby requiring additional controls and analyses.

In the proposed rulemaking, the NRC is moving in the direction of limiting storage of GTCC waste in an ISFSI to solid materials, thereby prohibiting the storage of liquids and wet wastes. The proposed rulemaking further restricts storage of waste where a potential exists for chemical, galvanic or other reactions associated with GTCC wastes. This leaves an open question as to the storage of solid waste which may contain some liquid (e.g., dewatered resin), and the NRC has requested comments from interested parties as part of the public review process. The proposed rule currently reads as follows:

> "The ISFSI must be designed to store spent fuel and/or solid reactor-related GRCC waste. Liquid reactor-related GTCC wastes may not be received or stored in an ISFSI."

[1] 10 CFR 72.2;72, 128

This approach may be unnecessarily restrictive, effectively removing the potential for technological solutions which would otherwise allow for the safe storage of all GTCC waste within an ISFSI. In its response to the proposed rule, NEI has suggested alternative language which would allow for technical solutions and design features demonstrated to mitigate any safety impacts associated with storage of GTCC wastes.[2]

3.2.4 Clarification of the Term "Spent Fuel"

Under authority of the Nuclear Waste Policy Act of 1982, the regulations in Part 72.3 define "spent fuel" to include:

> "the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies."

This is a key consideration of the regulations, since it impacts on the storage of highly radioactive materials which do not exceed Class C waste but which may be exposure-intensive and inordinately expensive to separate and ship for disposal in a Class A, B or C disposal facility. The Nuclear Energy Institute (NEI) has requested clarification in the final rulemaking for Part 72 which would ensure a consistent language between the regulations in Part 72 and the regulations in 10 CFR Part 961, "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste" (Standard Contract). According to the Standard Contract, non-fuel components include, but are not limited to: control spiders, burnable poison rod assemblies, control rod elements, thimble plugs, fission chambers, primary and secondary neutron sources, BWR channels, etc. In effect, this definition assigns Federal responsibility for disposal of these materials even if the materials were to be separated from the fuel for interim storage.

Explicit inclusion of these non-fuel components in the spent fuel storage definition is also supported by practical considerations. Non-fuel components are in close association with the fuel assembly in operation. These components remain with the fuel in water-type pool storage or dry cask storage. These same non-fuel components will ultimately be disposed of in the Federal repository in accordance with the Nuclear Waste Policy Act as implemented in 10 CFR Part 961. Thus, clarification of the definition of Spent Fuel with regard to "other radioactive materials associated with fuel assemblies" would minimize confusion, radiation exposures, and unnecessary expenditures.

The NRC has issued Interim Staff Guidance (ISG) 9 which addresses in greater detail the question of storing "other radioactive materials associated with fuel assemblies" in an ISFSI and the licensing considerations for doing so. A copy of ISG-9 is included in this report as Appendix G. [3]

[2] 10 CFR 72.120

[3] 10 CFR 72.3 and 10 CFR 961, NRC ISG-9

SUMMARY

Under current regulations, waste stored in an ISFSI under a site-specific Part 72 license must either be spent fuel or other radioactive materials associated with spent fuel storage. This generally excludes GTCC waste and most other LLW, aside from LLW generated during the routine operation of the ISFSI. The proposed rulemaking to Part 72 would allow storage of GTCC waste within the ISFSI, but would not change the storage limitations in effect for any other type of LLW.

The proposed rulemaking to Part 72 would limit the physical form of GTCC waste to solid waste only, with liquid wastes being specifically excluded. Other restrictions would be imposed to minimize the potential for chemical, galvanic or other reactions arising from the stored GTCC waste.

Spent fuel is defined to include "other radioactive materials associated with fuel assemblies." Although this lacks clarity in the current regulations and in the proposed rulemaking, efforts by NEI are underway to obtain clarification within the final rule so as to be consistent with the language for the Standard Contract (10 CFR Part 961) for disposal of spent fuel and associated non-fuel components. It is likely that this will be resolved either within the final rule or within the associated guidance document anticipated to be issued concurrently with the final rule.

3.3 Types of Licenses Authorizing Interim Storage of GTCC Waste

3.3.1 Specific and General Licenses for Interim Storage of GTCC Waste

GTCC waste can be stored in an onsite interim storage facility under a license obtained in accordance with one of the following regulations in 10 CFR:

1. Part 50 License – Storage of GTCC as part of the normal plant operating license, including GTCC waste stored within an ISFSI in containers separate from the spent fuel storage casks.

2. Part 30 License – Storage of GTCC that is byproduct material as defined in 10 CFR 30.3, but not special nuclear material.

3. Part 70 License – Storage of GTCC that is special nuclear material, as defined in 10 CFR 70.4.

4. Part 72 License – Storage of GTCC in an ISFSI. (This is not currently allowed as of the time of issuance of this draft report. This is being proposed by the NRC as part of the June 16, 2000, proposed rulemaking.)

In addition to the types of licenses obtainable under the various parts of 10 CFR, licenses for interim storage of GTCC waste may be either a general license or a specific license. For example, a licensee who has a 10 CFR Part 50 license can store reactor-related GTCC waste within the licensed area under the Parts 30 and 70 general license authority included in the Part 50 license. In other words, interim storage of GTCC waste is already authorized for a

commercial nuclear reactor licensee within its licensed area and without having to apply for or obtain a separate Part 30 or 70 license.

However, under current regulations, if the licensee desires to terminate its Part 50 license, it would be necessary to obtain either or both a Part 30 and Part 70 license for the interim storage of GTCC byproduct material or GTCC special nuclear material, respectively. Alternatively, if the licensee has a site-specific license for an ISFSI, it may seek an amendment to its Part 72 license to allow GTCC waste storage within the ISFSI after termination of the Part 50 license.

Some confusion arises over the general licensing authorizations of 10 CFR 72. Part 72.210 provides a general license for:

> "…the storage of spent fuel in an independent spent fuel storage installation at power reactor sites to persons authorized to possess or operate nuclear power reactors under part 50."

It is important to note that this general license does not currently allow for interim storage of GTCC waste at an ISFSI under a site-specific Part 72 license. It currently is limited to the storage of spent fuel only. However, storage of GTCC waste in an ISFSI under a Part 72 license is being proposed by the NRC as part of its June 16, 2000, proposed rulemaking. It might also be noted that this change is proposed indirectly (without specific reference in 72.210) by incorporating a specific reference in Part 72.6(a) and (b) which will include "reactor-related GTCC waste" under the general license. Although this leaves a gray area in the proposed regulations, it is probable that this will be resolved prior to the final rule by including a specific reference to GTCC in Part 72.210.[4]

3.3.2 Agreement State Licensing of GTCC Waste Storage

Under current regulations, GTCC waste which is stored under a Part 30 or Part 70 license may actually fall under the jurisdiction of an Agreement State. This creates the following somewhat confusing scenario:

1. While the Part 50 license is in effect, GTCC waste would normally be stored under the Part 50 license and would be under the jurisdiction of the NRC.

2. After termination of the Part 50 license, GTCC waste would be stored under a Part 30 or 70 license, or under a license issued by the Agreement State. The GTCC waste could then fall under the jurisdiction of the Agreement State.

3. Once an monitored retrievable storage (MRS) facility or disposal facility becomes available for GTCC waste, the waste would be shipped to the MRS or disposal facility and once again fall under the jurisdiction of federal authorities.

[4] 10 CFR 20/30/50/70; 10 CFR 72.6 and 72.210

Under the proposed rulemaking to Part 72, the storage of GTCC waste would always be covered under a license issued by the NRC. Specifically, the proposed revision to Part 72.8 states:

> "Agreement States may not issue licenses covering the storage of spent fuel and reactor-related GTCC waste in an ISFSI…"

This revision would resolve any potential confusion, minimize licensing actions, eliminate the need for multiple licenses, and avoid any potential for dual regulation.[5]

SUMMARY

- For a commercial nuclear plant which is still operating under its Part 50 license and which intends to do so throughout the foreseeable interim storage period, a separate Part 30 or Part 70 license is not required for storage of GTCC waste within the licensed area. The current regulations in Part 72.210 limit ISFSI storage to spent fuel and other radioactive material associated with spent fuel storage.
- If the licensee elects to terminate its Part 50 license, then it would need to obtain either or both a Part 30 and a Part 70 license to store GTCC waste under current regulations.
- The proposed rulemaking would change both of the above requirements by allowing storage of GTCC waste in an ISFSI using either a general Part 72 license (applicable while the Part 50 license is in effect) or under a specific Part 72 license (applicable while or after the Part 50 license is in effect). The licensee also retains the option of obtaining a separate Part 30 or Part 70 license for GTCC waste storage.
- Under current regulations, and following termination of a Part 50 license, GTCC waste stored in an ISFSI located in an Agreement State would require a separate license issued by the Agreement State. Under the proposed rulemaking for Part 72, and following termination of a Part 50 license, all GTCC waste stored in an ISFSI would be stored under an NRC-issued Part 72 specific license.

3.4 Term of GTCC Storage License

The regulations in Part 72.42 limit the duration of a specific license for storing spent fuel in an ISFSI to 20 years. Applications for renewal may be submitted in a timely manner to extend the storage period.

By contrast, the general license authorization for storage of spent fuel in an ISFSI is linked to the Part 50 license. Thus, spent fuel storage in an ISFSI operated under the general license may continue concurrently with the Part 50 license and terminates only when the Part 50 license is terminated.[6]

[5] 10 CFR 72.8 and 10 CFR 150.15(a)(7) and (8)

[6] 10 CFR 72.42

SUMMARY

Under proposed rulemaking for Part 72, GTCC waste could be stored in an ISFSI up to a maximum of 20 years plus any subsequent renewal periods.

4
STORAGE FACILITY DESIGN AND OPERATION RELATIVE TO GTCC WASTE

The existing regulations 72 do not allow for the storage of GTCC waste in the ISFSI under a site-specific Part 72 license, although storage may be accomplished under the Part 50 operating license. As discussed earlier, the NRC has proposed rulemaking to allow GTCC waste storage under a Part 72 license as well. The information in this chapter is provided on the basis of the information contained in the proposed rulemaking to Part 72 and its impact on other portions of Part 72 or other existing guidance documents.

It cannot be assumed that an existing ISFSI is adequately designed to accommodate storage of GTCC waste. As discussed in section 3.2.2 of this report, significant issues exist relative to the potential for adverse impact from chemical, galvanic (corrosive), organic (gaseous) and other interactions among the GTCC waste, spent fuel, and the ISFSI. Prior to storing GTCC waste in an ISFSI, a review of the general design criteria as it might apply to GTCC waste should be performed. This applies regardless of whether the ISFSI is being operated under a general Part 50 license authorization or a specific Part 72 license.

4.1 Safety Analysis Report

Prior to receiving GTCC waste, the licensee must include in its Safety Analysis Report (SAR) how the GTCC waste will be stored to prevent any potential adverse reactions:

- If the ISFSI is being operated under a general license (i.e., a Part 50 license), then a review of the existing SAR is necessary to ensure that the GTCC waste can be safely stored in the ISFSI without adverse impact to the spent fuel, ISFSI or environment. This would include a 10 CFR 50.59 review.
- If the ISFSI is being operated under an existing specific Part 72 license amended to allow storage of GTCC waste, then a review of the existing SAR is necessary to ensure that the GTCC waste can be safely stored in the ISFSI without adverse impact to the spent fuel, ISFSI or environment.
- If the ISFSI is not yet licensed, then the SAR submitted with the license application must include sufficient information to demonstrate that the GTCC waste can be safely stored in the ISFSI without adverse impact to the spent fuel, ISFSI or environment. A final SAR must be submitted to the NRC at least 90 days prior to receiving any spent fuel or GTCC waste for storage.

SUMMARY

Prior to receiving GTCC waste, the licensee must include in its Safety Analysis Report (SAR) how the GTCC waste will be stored to prevent any potential adverse reactions. The SAR should include the design, description of planned operations, and other information important to safe receipt, handling, packaging, storage and transfer of GTCC waste.[1]

4.2 General Design Criteria

In its proposed rulemaking to Part 72, the NRC has expressed reasonable concerns over potential adverse interactions between some types of GTCC waste and other materials stored in the ISFSI or with the ISFSI itself. Accordingly, the NRC currently proposes to limit GTCC waste stored in an ISFSI to solid waste only. Liquid GTCC wastes may not be received or stored in an ISFSI. If the ISFSI is a water-pool type facility, the GTCC waste must be in a durable solid form with demonstrable leach resistance. Each of these considerations must be addressed in the licensee's SAR.

Extending the above requirements to specific design criteria for the ISFSI, the regulations in Part 72.120(d) will require that the ISFSI:

> "…be designed, made of materials, and constructed to ensure that there will be no significant chemical, galvanic, or other reactions between or among the storage system components, spent fuel, [and] reactor-related GTCC waste."

The regulations also will require that the behavior of materials under irradiation and thermal conditions must be taken into account. This includes not only heat generation due to any stored spent fuel, but also thermal cycling from ambient temperatures and environmental conditions.

The regulations require that instrumentation and control systems for GTCC waste storage be provided to monitor systems that are important to safety. This becomes increasingly important for wastes which are potentially corrosive (i.e., may leak), organic (may overpressurize or explode), or otherwise chemically reactive.

It should be noted that the term "solid waste" includes dewatered resin. If dewatered resin or other organic media is intended to be stored, then monitoring and control of gas generation will be necessary.

Similarly, dewatered resin theoretically contains no free-standing liquids. However, environmental and storage conditions may impact the resin sufficient to release water of hydration, thereby offering a potential for leakage. The licensee is required in Subpart 72.126 to provide effluent monitoring capabilities, if not otherwise provided for spent fuel storage.

[1] 10 CFR 72.70

Subpart 72.128 requires that radioactive waste treatment facilities be provided for packaging of LLW generated during normal operation of the ISFSI (i.e., secondary waste). LLW includes GTCC waste. Although it is unlikely that secondary waste would exceed Class C, this potential must be evaluated and accommodated if applicable.

Note: Sealed sources which are GTCC waste may be stored in an ISFSI under the proposed rulemaking for Part 72. Such sources should be stored in accordance with the guidance in NRC Information Notice 93-50, *Extended Storage of Sealed Sources.* A copy of this Information Notice is included in the Appendices to this report.

SUMMARY

The general design criteria for an ISFSI must be reviewed and satisfied for safe storage of GTCC waste prior to receiving GTCC waste. This applies for both a Part 50 and Part 72 license.[2]

4.3 Container Design for GTCC Waste Storage

The regulations and current guidance documents related to storing radioactive materials in an ISFSI do not provide any separate design criteria for containers used to store spent fuel or GTCC waste at an ISFSI. It is incumbent upon the user to ensure that the GTCC waste does not adversely impact on the container, the storage cask, or anything else stored in the ISFSI.

One specific requirement included in the proposed rulemaking related to waste packaging involves handling and retreivability. GTCC waste must be packaged in a manner that allows handling and retrievability without the release of radioactive materials to the environment or radiation exposures in excess of Part 20 limits. This is included in 72.122(h)(5). One aspect of potential confusion exists in the last sentence of that paragraph, which states:

> "The package must be designed to confine the high-level radioactive waste for the duration of the license."

It is important to note that this last sentence applies to the "high-level radioactive waste" which is stored in a Monitored Retreivable Storage (MRS) facility and not an ISFSI. It is not specifically applied to GTCC waste. GTCC waste may be stored in the facility in one container, removed, repackaged into another container, then placed in storage again. Although this situation is less than ideal, it may become necessary depending upon the waste acceptance criteria and technical regulations established by the DOE for final acceptance and disposition of the waste.

Note: Chapter 6 provides additional guidance and links to other guidance on waste containers for GTCC waste stored in an ISFSI. That information should be reviewed and considered as part of the review for the general design criteria.

[2] 10 CFR 72.120, 72.122, 72.126, 72.128

SUMMARY

The regulations and current guidance documents related to storing radioactive materials in an ISFSI do not provide any separate design criteria for containers used to store spent fuel or GTCC waste at an ISFSI. It is incumbent upon the user to ensure that the GTCC waste does not adversely impact on the container, the storage cask, or anything else stored in the ISFSI.[3]

4.4 Changes, Tests and Experiments

Operators of commercial nuclear power plants are vell-versed in the requirements of 10 CFR 50.59. As it relates to the operation of an ISFSI under the general license authorization of Subpart 72.6, "any changes in the ISFSI or the procedures described in the Safety Analysis Report, or to conduct tests or experiments not described in the SAR, that involve an unreviewed safety question, a significant increase in occupational exposure, or significant unreviewed environmental impact," will require a license amendment.

This same review and evaluation requirement applies to specific licenses issued under Part 72. In this case, the nearly identical regulations governing changes, tests, and experiments are incorporated in Subpart 72.48. It is important for the licensee to recognize this requirement during its review of the ISFSI design criteria as they apply to GTCC waste. A "72.48 review" to identify any potential unreviewed safety questions should be accomplished prior to making any changes, tests or experiments at an ISFSI licensed under Part 72 and using the same level of careful discipline applied to "50.59 reviews" for an operating nuclear plant.

Note: The NRC may publish a notice in the Federal Register of proposed actions for a license amendment. The licensee is referred to 10 CFR Parts 50.90, 50.91, and 50.92.

SUMMARY

A "72.48 review" should be accomplished to identify any potential unreviewed safety questions prior to making any changes, tests or experiments at an ISFSI licensed under Part 72 and using the same level of careful discipline applied to "50.59 reviews" for an operating nuclear plant. Note that a "50.59 review" is required for an ISFSI being operated under a Part 50 license.[4]

4.5 Monitoring and Inspection

GTCC waste in storage must be monitored to ensure integrity of the waste container, and minimize occupational radiation exposures and uncontrolled releases. In developing the design criteria for the ISFSI, each licensee must develop specific functional and operating limits, identify necessary and appropriate monitoring instruments, and establish limiting control settings

[3] 10 CFR 72..122

[4] 10 CFR 50.59, 50.90, 50.91, 50.92; 10 CFR 72.48

for those monitoring instruments. These limits and instruments are addressed in the SAR, and they also are converted to specific technical specifications included in the ISFSI license conditions for safe operation.

These conditions and limits apply to waste handling and storage conditions, including waste handling and storage of GTCC waste. However, they are applied only to those instruments and limiting control settings "related to fuel or waste handling and storage conditions having significant safety functions."

In addition to the above monitoring requirements, the regulations in Part 72.44 establish surveillance requirements for spent fuel and GTCC waste in storage. These requirements include:

- Inspection and monitoring of spent fuel and GTCC waste.
- Inspection, test and calibration activities to ensure integrity of systems and components.
- Confirmation that the operation of the ISFSI is within the required functional and operating limits.
- Confirmation that the limiting conditions required for safe storage are being met.

Monitoring and inspection of GTCC waste is significantly different from spent fuel by virtue of the type of waste, activity, potential for significant exposure, potential for chemical, galvanic or other degradation of the storage container, and general flexibility of the storage container design for GTCC waste as opposed to spent fuel. Monitoring and inspection applicable to GTCC waste is addressed in a separate EPRI report which should be obtained and reviewed by each ISFSI licensee or applicant planning to store GTCC waste in their ISFSI:

> EPRI Report TR-105785, *Monitoring and Inspection of Low-Level Radioactive Waste Stored at Nuclear Power Plants*, December 1995.

SUMMARY

In addition to the basic facility design considerations applicable to GTCC waste stored in an ISFSI, routine monitoring and inspection requirements and associated equipment are needed for ensuring the integrity of waste containers, minimizing occupational exposures, and avoiding uncontrolled releases.[5]

[5] 10 CFR 72.44(c); EPRI TR-105785

5
ADMINISTRATIVE CONTROLS

Various subparts of the regulations in 10 CFR Part 72 and the associated guidance documents for storage of LLW address specific administrative controls for the management of waste-related data and for the projection and tracking of stored waste volumes. A Part 50 license includes technical specifications addressing any NRC concerns over safe storage of waste within an ISFSI. For an ISFSI operated under a site-specific Part 72 license, Subpart 72.44(c) establishes requirements for technical specifications to be included also in the license for an ISFSI. The proposed rulemaking for Part 72 would extend these same requirements to the storage of GTCC waste in an ISFSI.

The technical specifications address limiting conditions for operation, surveillance requirements, specific design features having a safety significance, etc. Also included are certain "administrative controls" which include:

- Organization and management procedures.
- Recordkeeping.
- Review and audit.
- Reporting necessary to assure that the storage operations are performed in a safe manner.

This chapter summarizes the significant administrative controls for the storage of GTCC waste within an ISFSI. Before proceeding, it should be noted that some administrative controls and regulations apply to all GTCC waste, whereas others apply only to GTCC waste which contains special nuclear material (SNM). Where applicable only to GTCC waste containing SNM, this is clearly identified within the related discussion. Otherwise, the requirements apply to all GTCC waste stored in an ISFSI.[1]

5.1 Reporting Requirements

5.1.1 Safety Analysis Report (SAR)

The SAR covering nuclear plant operations pursuant to a Part 50 license will address all safety-related considerations for storage of GTCC waste within a generally licensed ISFSI. For an ISFSI operated under a specific Part 72 license, the regulations in Part 72.24 require that a SAR be developed and maintained covering the receipt, handling, packaging and storage of spent fuel.

[1] 10 CFR 72.44(c)

The proposed rulemaking for Part 72 will extend these same requirements to GTCC waste "as appropriate."

Note: In this case, "as appropriate" recognizes that some aspects of the safety analysis report do not apply to GTCC waste. It is not intended to suggest that packaging need not be addressed because the waste will not be packaged at the ISFSI (i.e., arrives pre-packaged). In this case, the term "packaging" is defined in Subpart 71.4, "the assembly of components necessary to ensure compliance with the packaging requirements of this part. In other words, it is an assembly of one or more physical components and not the "act of placing materials in a package."

The proposed rulemaking for Part 72 goes beyond the existing regulations with a new paragraph, 72.24(r). It requires that the SAR include:

> "A description of the compatibility and suitability of the reactor-related GTCC waste with the ISFSI."

This requirement recognizes the potential for GTCC waste to contain liquids, chemicals, organic matter, corrosive materials, or other materials which could adversely affect or be affected by the ISFSI structural materials or other wastes or materials stored at the ISFSI. This concern was addressed in detail in Section 3.2.2 of this report. In the proposed rulemaking, the NRC is moving in the direction of limiting storage of GTCC waste in an ISFSI to solid materials, thereby prohibiting the storage of liquids and wet wastes. The proposed rulemaking further restricts storage of waste where a potential exists for chemical, galvanic or other reactions associated with GTCC wastes.

Note that such restrictions may not be specifically stated within the regulations for an ISFSI operated under a Part 50 license. However, the NRC requires that the GTCC waste must be stored in containers separate from the spent fuel storage casks, and the storage of GTCC waste must pose no safety problems for licensed activities under Part 50. Therefore, it is incumbent upon a utility storing GTCC waste within the ISFSI to ensure compliance with the technical considerations of the preceding paragraph.

The final rule may modify these restrictions, and it is always possible for the licensee to request an exemption allowing for storage of liquid or wet GTCC waste within an ISFSI. Before the NRC would approve such an exemption, the licensee would need to demonstrate that all GTCC waste intended for storage in the ISFSI would be compatible with and suitable for storage in the ISFSI.

Although not specifically addressed in the proposed rulemaking, other paragraphs within Subpart 72.24 bear directly upon the storage of GTCC waste and the development of the SAR. These include:

- ALARA considerations, including minimizing exposure arising from reprocessing or repackaging activities.
- Features of the ISFSI design and operating modes to reduce secondary waste generation.

- A description of the equipment to maintain control over GTCC waste in gaseous and liquid effluents (as may arise from storage of dewatered solid waste, corrosive waste, and waste containing organic matter).
- An estimate of the quantity of each of the principal nuclides expected to be released annually in liquid and gaseous effluents.
- A general description of the provisions for packaging, storage and disposal of solid wastes containing radioactive materials resulting from treatment of gaseous and liquid effluents and from other sources.

  Note: Some GTCC waste containers may have gas permeable vents installed to prevent overpressurization resulting from stored organics, such as dewatered resin (which is considered a solid under the proposed regulations). This should be addressed in the SAR, along with any associated consideration for gaseous effluents.

For a specific licensee, a final SAR (or FSAR) must be submitted to the NRC at least 90 days prior to receipt of spent fuel or GTCC waste. Thereafter, following the first receipt of spent fuel or GTCC waste, the SAR must be updated and submitted to the NRC annually, including any changes to the program for receipt, handling, packaging or storage of GTCC waste.[2]

5.1.2 Annual Effluent Release Report (AERR)

The technical specifications for an ISFSI must state the limits on effluent releases of radioactive materials for compliance with the ALARA regulations in 10 CFR Part 20. Pursuant to this effluent release limitation, the technical specifications require that an annual report be submitted to the NRC prior to March 1 of each year specifying the quantity of each of the principal radionuclides released to the environment in liquid and in gaseous effluents during the previous calendar year. This information allows the NRC to estimate the maximum potential radiation dose commitment to the public resulting from effluent releases.

For operators of commercial nuclear plants, this is an extension of the requirements for the Annual Effluent Release Report already being submitted every year. Under a Part 50 license, the Annual Effluent Release Report will encompass this Part 72 requirement, assuming the ISFSI is being operated under the general license authorization of Part 72.6. However, if the ISFSI is being operated under a separate specific license – regardless of whether the licensee retains or has terminated its Part 50 license – either a separate or concurrent submittal will be required.

It should be noted that the proposed rulemaking for Part 72 would extend the annual reporting requirement to include GTCC waste. The current Annual Effluent Release Report required under a Part 50 license typically identifies liquid and airborne effluents by nuclide and total effluent activity for each of the prinicpal nuclides. Solid effluents (waste shipments) also are reported by specifying the total activity of each of the principal nuclides and according to the waste class

[2] 10 CFR 72.24, 72.70

(i.e., principal nuclide activity is reported for Class A, B and C wastes separately). Solid waste must also be summarized by the type of waste as follows:

A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc. (total m^3 and Ci)

B. Dry Compressible Waste, Contaminated Equipment, etc. (total m^3 and Ci)

C. Irradiated Components, Control Rods, etc. (total m^3 and Ci)

D. Other (describe) (total m^3 and Ci)

When reporting the storage of waste in an ISFSI – whether under a general or specific Part 72 license -- the same approach should be applied. This means that the quantity of each principal nuclide of the stored spent fuel, GTCC waste, and any other radioactive material associated with spent fuel and GTCC waste storage should be listed by separate waste class: Class A, B, C, GTCC and Spent Fuel. In addition, the solid waste summaries must include all waste stored in the ISFSI, including the total in cubic meters (m^3) and curies (Ci). A reasonable effort should be made to identify stored wastes in addition to solid waste shipments.[3]

5.1.3 Material Status Reports

Part 72.76 requires licensees to submit to the NRC a "material status report." The report provides information concerning the special nuclear material contained in the spent fuel possessed, received, transferred, disposed, or lost by the licensee during storage within an ISFSI. The proposed rulemaking to Part 72 would extend this requirement to GTCC waste containing special nuclear material (SNM) and stored in an ISFSI. The specifics of this reporting requirement are as follows:

1. Each material status report must be in a computer-readable format.

2 A new material status report must be completed as of March 31 and September 30 of each year (i.e., generated semi-annually), and submitted to the NRC within 30 days thereafter.

   Note how this differs from the Annual Effluent Release Report which is submitted only once per year, covers a calendar year rather than overlapping years, and is due within 60 days of the end of the calendar year (or March 1).

3 Detailed instructions for completion and submittal of the material status report are found in NUREG/BR-0007 and NMMSS Report D-24, "Personal Computer Data Input for NRC Licensees."

[3] 10 CFR 72.44(d)(3)

If the licensee has no GTCC waste containing SNM, the material status report will still be submitted but will address only the SNM contained within the spent fuel. No specific reference is required for GTCC waste containing only byproduct material and stored in the ISFSI.[4]

5.1.4 Nuclear Material Transaction (Transfer) Reports

Under current regulations in 10 CFR 72.78, whenever a licensee transfers or receives spent fuel, the licensee needs to complete a Nuclear Material Transaction Report. Under the proposed rulemaking for Part 72, the NRC proposes to extend the reporting requirement to GTCC waste that contains special nuclear material.

If the licensee has no GTCC waste containing SNM, the Nuclear Material Transaction Report will still be prepared but will address only the SNM contained within the spent fuel. No specific reference is required for GTCC waste containing only byproduct material and stored in the ISFSI.

Although the regulations do not specifically state that the licensee needs to submit these reports to the NRC, the general language suggests that submittal is in order. (Submittal is required for participants in the US/IAEA Safeguards Agreement program, and such submittal is in accordance with 10 CFR 75.34.)

Reports must be prepared in computer-readable format. Detailed instructions for completion and submittal of the Nuclear Material Transaction Report are found in NUREG/BR-0006 and NMMSS Report D-24, "Personal Computer Data Input for NRC Licensees."[5]

5.1.5 Emergency Reporting Requirements

In its proposed rulemaking for Part 72, the NRC has extended its emergency reporting requirements to include GTCC waste. However, this applies only to non-emergency reporting under paragraphs 72.75(b) and (c) for four-hour and twenty-four reporting, as well as the applicable follow-up written reports within 30 days as required by 72.75(d). [6]

SUMMARY

Multiple reports and reporting requirements exist relative to waste storage in an ISFSI, and the proposed rulemaking to Part 72 will extend those reporting requirements to GTCC waste. These reporting requirements are summarized in Table 5-1.

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[4] 10 CFR 72.76(a); NUREG/BR-0007

[5] 10 CFR 72.78 and 10 CFR 75.34; NUREG/BR-0006

[6] 10 CFR 72.24, 72.75(b), (c), and (d)

Table 5-1
Summary of ISFSI Stored Material Reporting Requirements

Report Type	Frequency	Period Covered & Due Date
Final Safety Analysis Report	One time report	At least 90 days prior to receipt of spent fuel or GTCC waste
Safety Analysis Report Update	Annual	Yearly following first receipt of spent fuel or GTCC waste
Annual Effluent Release Report	Annual	Calendar Year; Due March 1
Material Status Report (For spent fuel or GTCC containing SNM)	Semi-Annual (twice a year)	Prepared Mar 31 and Sep 30; Due April 30 and Oct 30
Nuclear Waste Transaction Report (For spent fuel or GTCC containing SNM)	Upon each transfer or receipt of spent fuel or GTCC containing SNM	Upon each transfer or receipt of spent fuel or GTCC containing SNM
Emergency Notifications	Non-emergency events	4-hour and 24-hour requirements; written follow-up report within 30 days.

5.2 Material Balance, Inventory and Records

Current regulations in Part 72 require that each licensee maintain records showing the receipt, inventory (including location), disposal, acquisition and transfer of all spent fuel in storage. Although not specifically stated in the regulations, the intent behind the extensive recordkeeping requirements of 72.72 is the tracking and accountability of special nuclear material. This understanding is significant to the changes to 72.72 incorporated into the proposed rulemaking for part 72. In the proposed rule, the same recordkeeeping requirements apply to GTCC waste, but only for that GTCC waste which contains special nuclear material.

It is anticipated that the licensee will maintain records governing all GTCC waste in storage, but the recordkeeping requirements for special nuclear material (SNM) are more extensive than for GTCC waste containing only byproduct material. This is not immediately obvious from the language of 72.72 either in the existing regulations or in the proposed rulemaking. By contrast, if GTCC waste containing SNM is stored under a Part 70 license, the requirements for "material balance" are detailed in 70.51. By contrast, the regulations in Part 72.72 include the term "Material balance" in the subpart title, but the term is not further delineated nor defined elsewhere within Part 72. Material balance means:

> A determination of material unaccounted for (MUF) by subtracting ending inventory (EI) plus removals (R) from beginning inventory (BI) plus any additions to inventory (A). Mathematically:
>
> $$MUF = BI + A - EI - R$$
> $$= (BI + A) - (EI + R)$$

The regulations require that an inventory of the affected material be performed at least once every 12 months. (Note that this is not the same as annually.) Assuming that the inventory is performed every January, and applying the above formula, then the beginning inventory (BI) is the quantity of SNM present during last January's inspection. The additions to inventory (A) are the total quantity added since last January; the ending inventory is the quantity physically determined to be present during the current month's inspection; and the removals (R) are the SNM removed from storage for any purpose, including transfer to another licensee or shipment for disposal.

Using this approach, the objective is to demonstrate that the sum of the beginning inventory and any additions (BI + A) will be equal to the sum of the ending inventory plus any removals (EI – R). Thus,

$$MUF = BI + A – (EI + R) = 0$$

If MUF does not equal zero, then any difference must be appropriately reconciled.

It is important to recognize that the regulations addressing material balance of SNM in Part 70 tend to focus on radioactive materials in which SNM are the primary constituents of the material present. Although GTCC waste containing SNM can be stored under a Part 70 license, the SNM would typically represent a very small portion of the radioactivity present.

Thus, for Part 72 storage, it becomes incumbent upon the waste generator to consider the types and forms of the GTCC waste generated and to establish written procedures which will provide a reasonable accountability of any SNM present. For example, if GTCC waste containing SNM has been encapsulated in a cement monolith within a high integrity container and placed within a dry storage cask, then it is likely that verification of the presence of the container within the cask would adequately demonstrate that MUF = 0.

Recognizing this situation, the proposed rulemaking for Part 72 will require that, for GTCC waste containing SNM:

1. Records will be maintained showing the receipt, inventory (including location), disposal, acquisition and transfer of all GTCC waste containing SNM in storage.

2. A physical inventory of all GTCC waste containing SNM will be conducted at intervals not exceeding 12 months.

3. Written procedures shall be established for material control and accounting (i.e., mathematical accounting) sufficient to account for all SNM in storage.

4. Records of GTCC waste containing SNM will be maintained in duplicate, with the duplicate records maintained in a separate, remote location.

5. Records of GTCC waste containing SNM transferred out of an ISFSI (e.g., waste shipments to an MRS or for disposal) will be maintained for five years following transfer.[7]

[7] 10 CFR 72.72; 10 CFR 70.51

SUMMARY

Written accounting procedures must be established for material control and accounting (mathematical accounting) sufficient to maintain an accurate accounting of all SNM received, stored and transferred from storage. A physical inventory of spent fuel and GTCC waste containing special nuclear material and stored at the ISFSI must be performed at least once every 12 months. This inventory must be documented, available for inspection, and maintained in duplicate with the duplicate records stored in a separate, remote location. The records must show the receipt, inventory (including location), disposal, acquisition and transfer of all spent fuel and GTCC waste containing SNM in storage at the ISFSI.

5.3 Quality Assurance

Each licensee's Quality Assurance program for storing GTCC waste in an ISFSI must be approved by the NRC prior to receiving GTCC waste at the ISFSI. Quality assurance records related to any waste stored in an ISFSI are required in accordance with 10 CFR 72.174. The language of the existing regulations is sufficiently clear and applicable to any waste authorized for storage in an ISFSI, including any pending authorization for GTCC waste. Accordingly, no changes are included in the proposed rulemaking for Part 72.

As a brief review, QA records must include:

- Design records (including packaging and container testing records)
- Records of use and the results of reviews
- Inspections
- Tests
- Audits, Monitoring of work performance
- Material analyses[8]

SUMMARY

A Quality Assurance program must be in place prior to receipt of spent fuel or GTCC waste at an ISFSI, and the program shall apply to both spent fuel and GTCC waste, as well as any other radioactive materials or waste stored at the ISFSI.

5.4 Training and Certification of Personnel

The training and certification of ISFSI personnel is required in Part 72. It applies to personnel who operate equipment and controls that have been identified as important to safety in the Safety Analysis Report. The operation of such equipment and controls must be:

[8] 10 CFR 72.140, 72.174

> "…limited to trained and certified personnel or be under the direct visual supervision of an individual with training and certification in the operation."

In addition, supervisory personnel who personally direct the operation of equipment and controls important to safety must also be trained and certified in such operations, even if the actual operator is trained and certified. Consistent with these requirements, the licensee is also required to establish a training, proficiency testing, and certification program for ISFSI personnel. This training program is required to be submitted to the NRC along with the license application. This training is required to be completed prior to receipt of spent fuel.

Under the proposed rulemaking to Part 72, the training and certification requirement would be extended to include personnel operating equipment or controls important to safety as they affect the receipt, handling, packaging and storage of GTCC waste, as appropriate. This training and certification must be completed prior to receiving any affected GTCC waste.[9]

SUMMARY

A program for training, proficiency testing and certification of equipment and control operators is required prior to the receipt of spent fuel or GTCC waste at an ISFSI. This same program is required for supervisors of the equipment and control operators.

[9] 10 CFR 72.28, 72.190, 72.192

6
WASTE CONTAINERS FOR GTCC INTERIM STORAGE

6.1 Available EPRI Reports on LLW Containers for Extended Storage

At the time of developing this draft report (March 2001), there is limited guidance available related specifically to containers for the storage of GTCC waste in an ISFSI. However, the NRC provides guidance on containers for spent fuel and associated materials stored in dry cask storage systems, and there is extensive guidance on waste containers for the extended storage for LLW in general. Most of this information is applicable to GTCC waste regardless of whether it is stored in an ISFSI or other interim onsite storage facility.

EPRI's report series addressing *Interim On Site Storage of Low Level Waste* provides detailed information and requirements applicable to waste containers for extended storage, container monitoring and inspection, and container closures, seals and gas vents. These are available as the following EPRI reports:

- Electric Power Research Institute. TR-100298, V4, P1, *Interim Onsite Storage of Low Level Waste, Volume 4, Part 1: Waste Containers for Extended Storage*, September 1992.
- Electric Power Research Institute. TR-100298, V4, P3, *Interim Onsite Storage of Low Level Waste, Volume 4, Part 3: Waste Container Closures, Seals and Gas Vents*, September 1993.
- Electric Power Research Institute. TR-105785, *Monitoring and Inspection of Low-Level Radioactive Waste Stored at Nuclear Power Plants*, December 1995.

The user of this report should consider the recommendations included in the above reports when considering the selection of waste containers for storage in an ISFSI. Special attention should be given to the first report, which includes a comprehensive discussion of many of the available containers and packages for storing and transportation of LLW. It provides a methodology for LLW container selection and includes detailed analyses of container materials, linings, and coatings over the extended storage period, as well as the impact of various waste types and waste forms on such containers.

6.2 DOE Activities in Support of GTCC Waste Containers

Current DOE efforts are focussed primarily on disposal container designs for canistered spent fuel, uncanistered spent fuel, high-level waste, high level-waste co-disposed with DOE spent fuel, and immobilized plutonium canistered with high-level waste. Once the disposal container is loaded and sealed, it is referred to as a waste package. Waste packaging for GTCC waste is a relatively new concept for the DOE, but considerable progress has been made.

The design of spent fuel and GTCC waste containers is based on a defense-in-depth philosophy of using multiple barriers. Two different barrier materials support the design approach and have different failure mechanisms to protect against the release of radioactive materials. The outer barrier is a "corrosion-allowance" material that provides mechanical strength early in the life of the container. It also protects the inner barrier by allowing, but limiting, corrosion to a slow predictable rate. The inner barrier is a "corrosion-resistant" material that has a very long life.

The functions of the disposal container are to provide a waste containment barrier, act as a structural member to protect the waste from mishandling or impact damage, and assist in conducting heat away from the waste. The waste is sealed with an inner barrier lid and an outer barrier lid. The disposal container for spent fuel includes a basket for holding the fuel assemblies, which also provides the capability for additional criticality control, if required. These baskets can be removed if storing GTCC waste, thereby allowing for larger pieces of material and less cutting.

Because of weight and handling limitations, the disposal containers are not designed to provide shielding against radiation from the contained waste. Consequently, workers need to be protected by other means during canister loading, handling, and shipping.

In addition to the information available through EPRI, the DOE is in the process of developing a report describing its experience with the design and testing of a series of containers which will accommodate both spent fuel and GTCC waste. This is significant, since the container designs are intended to be consistent with the container handling equipment to be used at the future MRS and disposal facility, thereby minimizing radiation exposure during handling and minimizing the potential need for repackaging.

These containers were developed by the National Spent Nuclear Fuel Program which has responsibility for "DOE-owned issues" relative to GTCC waste management pursuant to the LLW Policy Amendments Act of 1985. The canisters were designed for spent nuclear fuel generated by the DOE and for other associated materials. As such, they can be used for some GTCC wastes. (Limitations apply to wastes containing organics which could generate gases, thereby requiring gas permeable vents. Limitations also apply to chemical wastes, corrosive wastes, explosive wastes, etc.)

The following four container configurations have been developed as part of this DOE program:

Table 6-1
Container Configurations for DOE Spent Fuel and GTCC Waste

External Diameter	External Length	Disposal Volume	Internal (Useable) Diameter	Internal (Useable) Length	Internal Volume	Maximum Weight
18 in 46 cm	10 ft 3 m	17.7 Ft^3 0.5 m^3	17 in 43 cm	100 in 254 cm	13.1 Ft^3 0.4 m^3	5000 lbs 2268 kg
18 in 46 cm	15 ft 4.6 m	26.5 Ft^3 0.8 m^3	17 in 43 cm	162 in 411 cm	21.3 Ft^3 0.6 m^3	6000 lbs 2722 kg
24 in 61 cm	10 ft 3 m	31.4Ft^3 0.9 m^3	23 in 58 cm	97 in 246 cm	23.3 Ft^3 0.7 m^3	9000 lbs 4082 kg
24 in 61 cm	15 ft 4.6 m	47.2 Ft^3 1.3 m^3	23 in 58 cm	159 in 404 cm	38.2 Ft^3 1.1 m^3	10,000 lbs 4536 kg

Note: Descriptions and technical specifications on other containers commonly being procured for spent fuel and GTCC waste storage by commercial nuclear plants being decommissioned are provided in Appendix E.

These containers are significantly larger than other containers currently used by waste generators for storage of GTCC within an ISFSI. The larger containers translates to less cutting, less handling, lower radiation exposures, and lower overall cost. Within each of the above containers, the fuel support (lattice) structure can be removed, thereby increasing the available space for GTCC waste.

It is important to note that these containers have already been developed, tested, and approved for DOE use. This is a significant step forward both for storage and for eventual disposal of GTCC waste. The DOE has been developing a draft report offering guidance on GTCC waste packaging, but there is no schedule for release to the nuclear industry.

SUMMARY

The DOE has responsibility for providing criteria for containers used to transfer GTCC waste to an MRS and for disposal of GTCC waste. The availability of written guidance providing this waste acceptance criteria is not known. The DOE has already developed several containers which could be used for this purpose and, subsequently, could be used to store GTCC waste in an ISFSI with a reduced likelihood of repackaging at the end of the storage period.

However, during 2001, the DOE has stepped away from providing detailed guidance on most GTCC waste issues. It is recommended that each licensee pursuing storage of GTCC waste in an ISFSI seek out and remain current with the latest information on DOE container licensing,

availability and usability, as well as similar information on containers offered by other suppliers.[1]

6.3 NRC Licensing Criteria for GTCC Stored Waste Containers

6.3.1 Overview

The general design criteria for an ISFSI includes certain requirements related to spent fuel storage which will be extended to GTCC waste under the proposed rulemaking for Part 72. Central to these design considerations and the applicability to GTCC waste is the focus on structures, systems and equipment important to safety (as defined in Subpart 72.3).

As pointed out in the proposed rulemaking, the storage of GTCC waste at an ISFSI presents safety and technical issues that differ from those previously addressed by the NRC for storage of spent fuel. For example, some forms of GTCC waste may be susceptible to radiolytic or thermal decomposition. Consequently, the design of a container for the storage of GTCC waste would need to consider the generation of gas or other products. Furthermore, given the potential mix of waste types within a container of stored GTCC waste, chemical, galvanic, or thermal interactions may occur between the GTCC waste and the ISFSI, or among the GTCC waste, the spent fuel, and the cask internals if stored in the same cask (i.e., commingled).

The key question here is how the stored GTCC waste may affect their storage containers and, directly or indirectly, affect the dry cask storage system. The potential for adverse impact is addressed and mitigated by the proposed rulemaking in Subpart 72.120(b), which requires that only solid GTCC waste may be stored in an ISFSI. Moreover, liquid GTCC wastes are specifically prohibited from being received or stored in an ISFSI. This applies to both a specific licensee and a general licensee (e.g., a plant with a Part 50 license which is operating an ISFSI under the general license authorization of Subpart 72.6).

In addition, the concern for potential reactions among commingled GTCC waste, spent fuel and the cask internals resulted in a prohibition in the proposed rulemaking against commingling GTCC waste and spent fuel within the same cask. An exception is applied for specific components associated with, and integral to, the spent fuel. (As noted in the Appendices, NEI has suggested some alternative language with respect to this portion of the rulemaking.)

The regulations further require in Subpart 72.120(d) that the ISFSI:

> "…must be designed, made of materials, and constructed to ensure that there will be no significant chemical, galvanic, or other reactions between or among the storage system components, spent fuel, and/or GTCC waste…including possible reaction with water during wet loading and unloading operations or during storage in a water-pool type

[1] Proceedings of NEI/EPRI Decommissioning/Dry Storage Planning and Technology Forum, Paper presented by Robert Hansson of INEEL on "GTCC Management;" July 2000.

ISFSI. [Moreover,] the behavior of materials under irradiation and thermal conditions must be taken into account."

6.3.2 NRC Design Guidance

Section 3.2.2 of this report discusses the concerns of significant chemical, galvanic or other reactions associated with storage of GTCC waste in and ISFSI. For those plants which already have an ISFSI which was designed specifically for storing spent fuel and without consideration for stored GTCC waste, additional reviews and analyses are indicated. Typically, such reviews are conducted in accordance with Subpart F of Part 72 (General Design Criteria), but also in accordance with 72.48 (which is nearly identical to the 10 CFR 50.59 review process).

Due in part to a number of material-related issues identified during dry cask storage system (DCSS) and transportation package application reviews and the associated field implementation, the NRC recognized the need for specific guidance for the review of materials selected by the applicant for its DCSS or transportation package. Interim Staff Guidance (ISG) 15, *Materials Evaluation*, was issued to meet this need. This ISG does not specifically address storage of GTCC waste, but the guidance encompasses material evaluation issues which must be addressed by any licensee seeking to store GTCC waste in containers located within the DCSS or commingled in the same container with spent fuel assemblies. The key guidance related to this section of the report is as follows:

Chemical and Galvanic Reactions

- The DCSS should prevent the spread of radioactive material and maintain safety control functions using, as appropriate, noncombustible and heat resistant materials.
- A review of the DCSS, its components, and operating environments (wet or dry) should confirm that no operation (e.g., short-term loading/unloading or long-term storage) will produce adverse chemical and/or galvanic reactions which could impact the safe use of the storage cask.
- Components of the DCSS should not react with one another, or with the cover gas or spent fuel, in a manner that may adversely affect safety. Additionally, corrosion of components inside the containment vessel should be effectively prevented.
- The operating procedures should ensure that no ignition of hydrogen gas should occur during cask loading or unloading.
- Potential problems from uniform corrosion, pitting, stress corrosion cracking, or other types of corrosion, should be evaluated for the environmental conditions and dynamic loading effects that are specific to the component.

6.3.3 NRC Limitations on Authorized Contents of Spent Fuel Casks

In October 1999, the NRC issued Information Notice 99-29, Authorized Contents of Spent Fuel Casks. This Notice alerts licensees to pay close attention to the authorized contents loaded into spent fuel casks in dry cask storage. The specified contents authorized for each approved spent

fuel cask are listed in the Certificate of Compliance (CoC), for the casks or in the site-specific Part 72 license. Site-specific Part 72 licenses specify the types of materials authorized to be loaded into the casks; for general licenses, the cask's CoC states the authorized cask contents.

6.3.4 Safety Analysis Report Considerations

Within the Safety Analysis Report covering the ISFSI, the licensee (or applicant for a license) is required to describe how the GTCC waste is stored. The SAR must describe how those structures, systems and components that are important to safety are properly designed to allow the storage of GTCC waste within the ISFSI. The regulations and current guidance documents do not provide any separate design criteria for GTCC waste storage containers. Final disposal containers (and containers for waste transferred to the MRS) will be defined by the DOE in accordance with the Low Level Waste Policy Amendments Act of 1985. Safe storage is governed by the provisions of 10 CFR 20 and 72. Thus, it is incumbent upon the licensee to ensure that the co-location of GTCC waste does not have an adverse effect on the safe storage of spent fuel and the operations of the ISFSI.

6.3.5 Inspection of Stored Containers

As a final consideration, the existing regulations in Subpart 72.168 require that the licensee provide measures to indicate the inspection status of containers in storage. This will apply to GTCC waste as well. The requirement states in part:

> "The licensee shall establish measures to indicate, by the use of markings such as stamps, tags, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items of the ISFSI."

The intent of this requirement is to provide for easy identification of items which have passed required inspections and tests. This will preclude any inadvertent bypassing of the inspections and tests. Licensees should keep this requirement in mind when selecting a container for storage to ensure that the required markings can be attached to the container or otherwise accommodated.

SUMMARY

The regulations and current guidance documents do not provide any separate design criteria for containers used to store spent fuel or GTCC waste at an ISFSI. It is incumbent upon the user to ensure that the GTCC waste does not adversely impact on the container, the storage cask, or anything else stored in the ISFSI. Prior to receiving GTCC waste, the licensee must include in the Safety Analysis Report how the GTCC waste will be stored to prevent any potential adverse reactions.[2]

[2] 10 CFR 50.59; 10 CFR 72.48, 72.120, 72.122, 72.168, NRC IE Notice 99-29

7
WASTE FORMS FOR INTERIM STORAGE

7.1 Solid Waste vs Liquid Waste Storage

In its proposed rulemaking to Part 72, the NRC has expressed reasonable concerns over potential adverse interactions between some types of GTCC waste and other materials stored in the ISFSI or with the ISFSI itself. Accordingly, the NRC currently proposes to limit GTCC waste stored in an ISFSI to solid waste only.

Thus, at the present time and for the foreseeable future, liquid GTCC wastes may not be received or stored in an ISFSI. If the ISFSI is a water-pool type facility, the GTCC waste must be in a durable solid form with demonstrable leach resistance. Each of these considerations must be addressed in the licensee's SAR.

Nuclear plants which currently store or plan to store GTCC waste at an ISFSI operated under a Part 50 license should review the applicable SAR to verify that their interim storage practices and procedures reflect this waste form restriction.

It should be recognized that there are alternatives for a Part 50 licensee which desires to terminate its license yet still possesses liquid GTCC waste. These alternatives include the licensee's submission of an application for a Part 30 or 70 license specifying the appropriate condiditons for storage of liquid GTCC waste. The licensee may also request an exemption from the requirements of Part 72 restricting the storage of liquid GTCC waste.

7.2 Dewatered Resin and Organic Media

It should be noted that the term "solid waste" includes dewatered resin. If dewatered resin or other organic media is intended to be stored, then monitoring and control of gas generation will be necessary, just as it is for any other LLW storage facility. EPRI's Interim On Site LLW Storage report series provides excellent guidance on storing dewatered resin and other organic media.

Similarly, dewatered resin theoretically contains no free-standing liquids. However, environmental and storage conditions may impact the resin sufficient to release water of hydration, thereby offering a potential for leakage. The licensee is required in Subpart 72.126 to provide effluent monitoring capabilities, if not otherwise provided for spent fuel storage.

The proposed rulemaking for Part 72 requests input from the public on several specific issues, including two related to liquid wastes and dewatered resin:

1 Should the storage of solid GTCC waste that may contain free liquid (e.g., dewatered resin) be prohibited in either commingled or separate GTCC casks? Or should storage be permitted if performance criteria can be established? If so, what criteria should be used?

2 Should the storage of liquid GTCC waste be prohibited in either commingled or separate GTCC casks? Or should storage be permitted if performance criteria can be established? If so, what criteria should be used?

The above questions demonstrate that the NRC is not committed to allowing dewatered resin to be stored in an ISFSI. It also is leaving the door open to further discussion on the potential for storing liquid GTCC waste.

SUMMARY

The proposed rulemaking to Part 72 would allow for storage at an ISFSI of solid GTCC waste only (including dewatered resin). It will prohibit storage of liquid GTCC waste within an ISFSI. Since neither of these is a certainty at the present time, nuclear plants which have GTCC resin or liquid waste may want to postpone any final waste form or waste conditioning decisions until after the final rulemaking.[1]

[1] 10 CFR 72.70, 72.120

8
INDUSTRY EXPERIENCE WITH GTCC WASTE STORAGE AND LESSONS LEARNED

It is an objective of this report to capture existing GTCC waste management and storage experience (i.e., lessons learned) from decommissioning nuclear plants. An abbreviated telephone survey was conducted of most of the nuclear plants actively involved in decommissioning to accomplish this objective. Their responses are summarized in this chapter.

8.1 Lessons Learned

Table 8-1
Summary of GTCC Wastes at Decommissioning Commercial Nuclear Plants (Based on Actual or Projected Data)

Typical Generation Volumes	200 to 400 Ft3
Typical Disposal Volume Projection (Usually not tracked this way yet)	One to Four Canisters (350 to 1400 Ft3)
Current GTCC Waste Storage Authority	10 CFR Part 50 License
Long Term GTCC Waste Storage Authority	10 CFR Part 72 License or Undecided
Amount of GTCC Waste Exceeding Class C Limit by < 10% of Limit	< 2% (See lesson #1 below)
Anticipated Repackaging of GTCC Waste Prior to Disposal	(See lesson #2 below)
Identified GTCC Waste Materials (Listed in descending order of frequency)	• Reactor internals (e.g., shroud, support plate, grid bars) • Control rods and control element assemblies (complete or partial) • Cutting dross/swarf • Incore detectors • Neutron windows • Excore detectors • Filter liner • Part of HPSI nozzle

*

1. A reasonable question to explore was whether a minor increase (10%) in the current Class C upper limit would have a significant impact on GTCC waste volumes. This limited survey suggests that less than 2% of the GTCC waste would be affected if the upper Class C limit was increased by a factor of 1.10 (a 10% increase) over its current value.

2. Currently, there is no waste acceptance criteria for disposal of GTCC waste. This is the responsibility of the DOE and may not be forthcoming for several years. Most plants are proceeding planning to package and store GTCC waste in the same type of canisters used for spent fuel assemblies. As such, they do not anticipate having to repackage that waste. However, provisions should be made in the GTCC storage plan for future repackaging if necessary. Such repackaging may occur either at the ISFSI or at the waste repository.

   An open issue is whether GTCC waste can be placed in canisters and stored inside the dry cask storage system. Current guidance indicates that GTCC waste can be stored on the cask storage pad(s) of an ISFSI under a Part 50 license, but it must be stored in containers separate from the spent fuel storage casks. This may delay packaging pending a revised final rulemaking by the NRC on Part 72 licensing. (See lesson #3 for related information.)

3. In a closely related issue, several licensees are evaluating storage of some GTCC waste within the same canisters where fuel assemblies are being stored. This makes sense for some items, such as incore detectors and control rods. Plants are advised to obtain a formal determination from the NRC as to whether this is permissable or not.

   Currently, most decommissioning plants store GTCC waste under the general license provisions of the Part 50 license. Current regulations and the available guidance documents allow GTCC waste to be "stored at a reactor site, including the cask storage pad(s) of an ISFSI, under a 10 CFR Part 50 license. The GTCC waste must be stored in containers separate from the spent fuel storage casks." (This guidance is contained in a letter dated September 27, 1999, from E. William Brach, Director, Spent Fuel Project Office, NRC, to Dr. Andrew Kadak, President, American Nuclear Society. A copy of this guidance document is included in Appendix F of this report.)

   The above guidance indicates that commingling GTCC waste with spent fuel in the same canisters or casks is not acceptable in most cases. This has forced some plants to delay packaging of their GTCC pending final rulemaking to Part 72 or the pursuit of a license amendment. Additional guidance is provided in NRC Interim Staff Guidance 9, (ISG-9), *Issue: Storage of Pressurized Water Reactor (PWR) Fuel Assembly Integral Components* available over the Internet. (See the Bibliography for internet address/URL.)

4. In October 1999, the NRC issued Information Notice 99-29, Authorized Contents of Spent Fuel Casks. This Notice alerts licensees to pay close attention to the authorized contents loaded into spent fuel casks in dry cask storage. The specified contents authorized for each approved spent fuel cask are listed in the Certificate of Compliance (CoC), for the casks or in the site-specific Part 72 license. Site-specific Part 72 licenses specify the types of materials authorized to be loaded into the casks; for general licenses, the cask's CoC states the authorized cask contents.

The NRC identified two instances where licensees loaded storage casks with spent fuel containing burnable poison rod assemblies (BPRAs) and thimble plugging devices (TPDs). These items were not authorized in either the site-specific license or the cask CoC. Therefore, the licensees violated the terms of their NRC license specifications for the materials that are permitted for storage in dry casks. Although the safety significance associated with these specific instances is low, in each case the licensee was required to take immediate action to either correct the cask loading or to justify the continued safety of the as-loaded cask conditions. In the two known instances where BPRAs and/or TPDs were loaded in dry casks without NRC authorization, five violations were identified.

5. A common form of GTCC waste is termed either “dross” or “swarf.” This is the residue and slag which is produced during underwater cutting processes typically used for cutting reactor internals. At one plant, careful collection and combining of all dross/swarf from a cutting project resulted in sufficient draus and abrasive material for concentration averaging to allow most of it to be disposed as Class C waste. In this particular case, the plant used ultra-high pressure water jetting with an abrasive additive to cut the internals. Large pieces were removed and stored as GTCC waste, but the bulk of the material remained as Class C waste.

6. Planning for the maximum size of any material loaded into a storage canister will minimize the total number of cuts. This, in turn, will reduce the project duration, the total exposure, the project cost, and the total volume of dross/swarf generated.

   This seemingly minor point is very possibly one of the most important decisions made by a decommissioning nuclear plant, and it applies to all waste removed from the plant (i.e., cut the waste to fit the shipping container). When applied to GTCC waste, the number of cuts can have a very substantial impact on project exposure, duration and cost.

   Not all plants take the same approach with the segmenting of GTCC waste. For example, some cut the waste into fuel element sizes, thereby allowing them to handle and load the GTCC into fuel canisters (separately from spent fuel) using similar techniques. By contrast, other plants cut the waste in pieces which are as large as can possibly fit into the storage canisters, thereby reducing the number of cuts, the volume of dross/swarf generated, the associated exposure, and the project duration and cost.

7. Plants commented that the use of ultra-high pressure (UHP) water cutting for high activity materials worked well. Competing experiences also pointed out that vendor experience was a key factor in the success of UHP cutting. If the cutting process is not carefully controlled, significant contamination control problems arise, including discrete radioactive particles. In addition, poor control of the process can result in a substantial increase in total project dose. Prior to using UHP cutting for reactor internals, plants should evaluate the experiences and lessons learned by other plants. (See also section 8.2.7 for additional discussion on significant challenges experienced during equipment cutting.)

8. Most, but not all, plants were able to dispose of excore detectors as Class C waste. Incore detectors may go either way. Perhaps the most significant deciding factor is whether the tips are cut away from the whips, thereby reducing the area for concentration averaging.

9. Trojan nuclear plant was able to package waste which would otherwise have been classified as GTCC waste within the reactor pressure vessel. Concentration averaging across the entire package (the pressure vessel was the disposal package) reduced the activity to Class C waste allowing for shallow land disposal.

   In a survey of decommissioning plants, all agreed that this was a highly desirable option, but it is not available to most nuclear plants. Trojan's unique location near a major waterway and relatively close to a disposal site made this an option which most plants cannot duplicate. However, the option is such an attractive solution that all plants should at least explore its potential.

10. One plant obtained a special amendment to the Certificate of Compliance for a storage canister to allow containerization of control element assemblies and the associate fingertips. These items were placed in a sleeve which was then placed in a spent fuel canister which has no spent fuel.

11. One plant noted a special concern in performing the safety analysis for its GTCC waste canisters which may be stored under a Part 50 license within the ISFSI but separate from the spent fuel storage casks. It was necessary in the performance of the 10 CFR 50.59 review to demonstrate that the canister could not tip over. In similar circumstances when storing under a Part 72 license (if authorized to do so), this same demonstration would be part of the 10 CFR 72.48 review.

12. As part of an EPRI conference discussion on GTCC waste, one utility inquired as to whether the fuel channel can be considered as a part of the spent fuel even though it was actually a part of the reactor and not physically attached to the fuel assembly. The answer to this question is NO; fuel channels should not be packaged with the fuel.

13. One utility pointed out that some of the GTCC waste removed from the reactor can exceed the general radiation field criteria envelope established by the DOE for fuel canister packages. For those cases where the utility is planning to use a fuel canister for storage of GTCC waste, the utility strongly recommended that the waste generator provide enough internal shielding for the canister to ensure that the canister package is within the general radiation field criteria.

14. Three Mile Island had extensive experience dealing with GTCC waste, although at the time it was termed as "abnormal waste" (i.e., special case waste generated prior to implementation of 10 CFR 61). This category included very high activity wet wastes (resin and filters) which were subsequently stabilized and/or stored. Some of the resin liners at TMI contained over 100,000 curies of activity, with most liners containing several thousand. The most significant challenges with such wastes fell into the arena of dewatering and conbustible gas generation.

    For generators faced with special case GTCC filter or resin waste with unusually high activity, additional guidance may be obtained from the original GEND documentation (a series of documents issued under the auspices of GPU, EPRI, NRC and DOE) covering packaging, shipping, stabilization, storage and disposal. The appropriate contact is EPRI.

8.2 Most Significant Challenges in Working with GTCC Waste

1. For Trojan, the greatest challenge was in shipping the reactor pressure vessel.

2. Uncertainty in regulatory changes slows or delays the process of packaging GTCC waste.

3. Absence of disposal waste acceptance criteria inhibits GTCC waste packaging and may result in repackaging of some or all GTCC waste. This appears to be a growing challenge and concern for nuclear utilities as the DOE has slowed the pace of information transfer to the commercial sector. This is, in part, a response to litigation against the DOE on spent fuel acceptance issues and has subsequently been passed along to GTCC waste considerations.

4. It is often difficult to match canister design with segmentation and cutting so as to optimize the size and shape of waste material. This is particularly challenging if the waste is to be loaded in relatively small spent fuel baskets in canisters designed for spent fuel assemblies and can result in low packaging efficiencies.

5. Characterization of reactor internals is an area of limited experience.

6. There is a steep learning curve for evaluating the nonradiological hazards associated with storage of GTCC waste in an ISFSI. These hazards include galvanic corrosion, gas generation, etc.

7. Segmentation and cutting of GTCC waste materials (reactor internals, core shroud, etc.) is particularly challenging from a scheduling standpoint and from a dose control (ALARA) standpoint. Equipment reliability in segmentation and cutting processes can lead to significant scheduling delays and substantial radiological exposures. Because this is such an important challenge faced by all nuclear facilities during the decommissioning process, the following additional detail is provided based on one utility's extensive experience:

    a) During cutting operations, discrete radioactive particles (hot particles) become a very significant control challenge. The need for extensive ALARA pre-planning is easily underestimated, as demonstrated in the following paragraphs.

    b) The garnet waste (abbrasive cutting material) collection system must be carefully designed to handle the very large quantities of garnet and the velocities of the garnet as close to the point of generation as possible. Maintaining positive, tight control over the garnet waste requires close capture. However, garnet is, after all, an abbrasive cutting material. Close capture exposes the garnet collection system to abbrasive cutting and can lead to early and frequent equipment failure if not properly designed for the large volume and velocities of the garnet. If improperly designed, the dross/swarf – all of which is likely to be GTCC waste – will migrate around the reactor cavity and core. This in turn will translate to a labor intensive and dose intensive clean-up process.

    c) The filtration system must be designed for easy flushing and cleaning while still ***underwater***. Otherwise, the dose and time delays will get out of hand. It must be recognized that the dose rates on these underwater filters are typically on the order of 100 R/hr to 300 R/hr.

d) It is essential that an ALARA evaluation be performed on each component of the collection and filtration systems as far in advance as possible. ***This review should include contingency planning for the failure of each component and the associated dose impact to replace or repair each component***.

e) The application of ultra-high pressure (UHP) abbrasive water jetting/cutting and plasma cutting are new technologies to most nuclear plants. Local inexperience with exceptionally radioactive jobs over a 6 to 12 month cutting project can increase a 50 to 70 person-rem job by as much of 20% to 100%. Thus, it is recommended that the plant seek to augment its staff with outside assistance and experience for these high-dose projects.

f) The initial project ALARA planning should include transportation, shielding and disposal, including ensuring that the size of each cut is linked to a waste package which will accommodate each piece of waste without unnecessary cuts. Otherwise, extra cuts, multiple handling, and repackaging will significantly impact dose and time projections.

g) When shipping spent abbrasive media (garnet), hoses, and other support equipment used in GTCC cutting operations, it is essential to consider waste characterization issues from a transportation and disposal perspective (i.e., it is easy to exceed 10 mR/hr at 2 meters). This potential dose impact and the associated shielding and repackaging exposure should be anticipated and planned for up front.

h) The above experiential lessons demonstrate the importance of planning the entire cutting operation from a cradle-to-grave perspective, with the plan beginning before the equipment and support crews arrive and ending after everything is packaged, shipped and stored or disposed.

A
BIBLIOGRAPHY

Federal Register, *Interim Storage of Greater Than Class C Waste;* June 16, 2000.

10 CFR Part 20, *Standards for Protection Against Radiation.*

10 CFR Part 30, *Rules of General Applicability to Domestic Licensingof Byproduct Material.*

10 CFR Part 50, *Domestic Licensing of Production and Utilization Facilities.*

10 CFR Part 70, *Domestic Licensing of Special Nuclear Material*.

10 CFR Part 72, *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste*.

10 CFR Part 961, *Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste*.

Regulatory Guide 1.143, *Design Guidance for Radioactive Waste Management Systems, Structures and Components Installed in Light-Water-Cooled Nuclear Power Plants*, Rev.1; October 1979.

Standard Review Plan (SRP) Section 11.4, *Solid Waste Management Systems"* Rev. 2; July 1981.

Branch Technical Position ETSB 11-3, *Design Guidance for Solid Radioactive Waste Management Systems Installed in Light-Water-Cooled Nuclear Power Reactor Plants*.

SRP Section 11-4, Appendix A, *Design Guidance for Temporary Onsite Storage of Low Level Radioactive Waste;"*

SECY 97-056, *Interim Storage for Greater Than Class C Waste, Changes to 10 CFR Part 72;* March 5, 1997.

SECY 94-198, *Review of Existing Guidance Concerning the Extended Storage of Low-Level Radioactive Waste;* August 1, 1994.

Generic Letter 81-38, *Storage of Low-Level Radioactive Wastes at Power Reactor Sites;* November 10, 1981.

Information Notice 89-13, *Alternative Waste Management Procedures In Case of Denial of Access to Low-Level Waste Disposal Sites*; February 8, 1989.

Information Notice 90-09, *Extended Interim Storage of Low-Level Radioactive Waste By Fuel Cycle and Materials Licensees;* February 5, 1990.

IE Circular 80-18, *10 CFR 50.59 Safety Evaluations for Changes to Radioactive Waste Treatment Systems;* August 22, 1980.

IE Information Notice 99-29: *Authorized Contents of Spent Fuel Casks,* October 28, 1999.

DOE Office of Acceptance, Transportation and Integration (Office of Civilian Radioactive Waste Management), *Civilian Radioactive Waste Management System, Total System, Revision 1*, October 30, 1998.

NRC Report Number: NUREG/BR-0007, Revision 3, *Instructions for the Preparation and Distribution of Material Status Report (DOE/NRC Forms 742 and 742C),* October 1999.

NRC Report Number: NUREG/BR-0006, Revision 4, *Instructions For Completing Nuclear Material Transfer Reports (DOE/NRC Forms-741, 741A, and 740M),* October 1999.

NRC Report Number: NUREG/BR-0216, *Radioactive Waste: Production, Storage, Disposal,* July 1996.

NRC Report Number: NUREG 1536, *Standard Review Plan for Dry Cask Storage Systems*, January 1997.

NRC Report Number: NUREG 1567, *Standard Review Plan for Spent Fuel Dry Storage Facilities,* March 2000.

NRC Report Number: NUREG 1609, *Standard Review Plan for Transportation Packages for Radioactive Material*, Draft, November 1997.

NRC Report Number: NUREG 1617, *Standard Review Plan for Transportation Packages for Spent Nuclear Fuel*, March 2000.

NRC Spent Fuel Project Office, Interim Staff Guidance – 9 (ISG-9), *Issue: Storage of Pressurized Water Reactor (PWR) Fuel Assembly Integral Components,* January 10, 2001 (available at Internet web page www.nrc.gov/OPA/reports/isg15r0.pdf).

NRC Spent Fuel Project Office, Interim Staff Guidance – 15 (ISG-15), *Materials Evaluation*, June 20, 2000 (available at Internet web page www.nrc.gov/OPA/reports/isg9.htm).

NRC letter from E. William Brach, Director, Spent Fuel Project Office, NRC, to Dr. Andrew Kadak, President, American Nuclear Society, (no subject specified; generic subject is storage of GTCC waste at an ISFSI); September 27, 1999.

Hansson, Robert, (INEEL), *GTCC Management;* Proceedings of NEI/EPRI Decommissioning/Dry Storage Planning and Technology Forum, Paper presented by July 2000.

Electric Power Research Institute. TR-100298, V1, *Interim Onsite Storage of Low level Waste, Volume 1: Licensing and Regulatory Issues,* May 1992.

Electric Power Research Institute. TR-100298, V2, P1, *Interim Onsite Storage of Low Level Waste, Volume 2, Part 1: Facility Design Options,* September 1992.

Electric Power Research Institute. *Interim Onsite Storage of Low Level Waste, Volume 2, Part 2: Survey of Existing Onsite LLW Storage Facilities*, September 1992.

Electric Power Research Institute. TR-100298, V3, P1, *Interim Onsite Storage of Low level Waste, Volume 3, Part 1: Waste Volume Projections and Data Management*, December 1992.

Electric Power Research Institute. TR-105891, *Assessment of a Low-Level Waste Outside Storage Pad Design Method*, December 1995.

Electric Power Research Institute. *Low-Level Radioactive Waste Characterization Guidelines,* November 1996.

Electric Power Research Institute. TR-100298, V4, P1, *Interim Onsite Storage of Low Level Waste, Volume 4, Part 1: Waste Containers for Extended Storage*, September 1992.

Electric Power Research Institute. TR-100298, V4, P3, *Interim Onsite Storage of Low Level Waste, Volume 4, Part 3: Waste Container Closures, Seals and Gas Vents*, September 1993.

Electric Power Research Institute. TR-101669, *Guidelines for Interim Storage of Low Level Waste*, December 1992.

Electric Power Research Institute. TR-105784, *Interim Onsite Storage of Low Level Waste Facility Design Options: Bulk Ion-Exchange Resin Storage*, December 1995.

Electric Power Research Institute. TR-105785, *Monitoring and Inspection of Low-Level Radioactive Waste Stored at Nuclear Power Plants,* December 1995.

Electric Power Research Institute. TR-105787, *Interim On Site Storage of Low Level Waste: Waste Forms For Extended Storage*, December 1995.

B
PROPOSED RULEMAKING FOR 10 CFR PART 72

[Federal Register: June 16, 2000 (Volume 65, Number 117)] [Proposed Rules]

[Page 37712-37723]

From the Federal Register Online via GPO Access [wais.access.gpo.gov] [DOCID:fr16jn00-13]

This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

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NUCLEAR REGULATORY COMMISSION

10 CFR Parts 72 and 150

[Docket No. PRM-72-2] RIN 3150-AG33

Interim Storage for Greater Than Class C Waste

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to grant in part and deny in part a petition for rulemaking submitted by Portland General Electric Company (PRM-72-2) by amending its regulations dealing with greater than class C (GTCC) waste. The proposed amendments would only apply to the interim storage of GTCC waste generated or used by commercial nuclear power plants. The proposed amendments would allow licensing for interim storage of GTCC waste in a manner that is consistent with licensing the interim storage of spent fuel and would maintain Federal jurisdiction for storage of reactor-related GTCC waste. These proposed amendments would also simplify and clarify the licensing process.

DATES: The comment period expires August 30, 2000. Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Submit comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Attention: Rulemakings and Adjudications Staff.

Deliver comments to 11555 Rockville Pike, Rockville, Maryland, between 7:30 am and 4:15 pm on Federal workdays.

You may also provide comments via the NRC's interactive rulemaking website (http://ruleforum.llnl.gov). This site provides the capability to upload comments as files (any format), if your web browser supports that function. For information about the interactive rulemaking site, contact Ms. Carol Gallagher, (301) 415-5905 (e-mail cag@nrc.gov).

Certain documents related to this rulemaking, including comments received, may be examined at the NRC Public Document Room, 2120 L Street NW (Lower Level), Washington, DC. These same documents also may be viewed and downloaded electronically via the rulemaking website.

Documents created or received at the NRC after November 1, 1999, are also available electronically at the NRC's Public Electronic Reading Room on the Internet at http://www.nrc.gov/NRC/ADAMS/ index.html. From this site, the public can gain entry into the NRC's Agency wide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. For more information, contact the NRC Public Document Room (PDR) Reference staff at 1-800-397-4209, 202-634-3273, or by email to pdr@nrc.gov.

FOR FURTHER INFORMATION CONTACT: Mark Haisfield [telephone (301) 415- 6196, e-mail MFH@nrc.gov] or Philip Brochman [telephone (301) 415-8592, e-mail PGB@nrc.gov] of the Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555- 0001.

SUPPLEMENTARY INFORMATION:

Background

The Petition for Rulemaking

The Nuclear Regulatory Commission received a petition for rulemaking dated November 2, 1995, submitted by Portland General Electric Company. The petition was docketed as PRM-72-2 and published in the Federal Register, with a 75-day comment period, on February 1, 1996 (61 FR 3619).

The petitioner requested that the NRC amend 10 CFR Part 72 to add the authority to store radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in 10 CFR 61.55.\1\ This material is commonly referred to as ``greater than class C'' waste or GTCC waste. GTCC waste is generally unsuitable for near- surface disposal as low-level waste (LLW), even though it is legally defined as LLW. 10 CFR 61.55(a)(2)(iv) requires that this type of waste be disposed of in a geologic repository unless approved for an alternative disposal method on a case-specific basis by the NRC.

\1\ In 10 CFR Part 61.55, ``Waste Classification,'' the NRC codifies disposal requirements for three classes of low-level waste which are considered generally suitable for near-surface disposal. These are Class A, B, and C. Class C waste is required to meet the most rigorous disposal requirements.

The petitioner is an NRC-licensed utility responsible for the Trojan Nuclear Plant (Trojan). In the petition, the petitioner anticipated that it would need to dispose of GTCC waste during decommissioning. The decommissioning plan specifies the transfer of spent reactor fuel, currently being stored in the spent fuel pool, to an onsite Independent Spent Fuel Storage Installation (ISFSI) licensed under 10 CFR Part 72. The petitioner requested that 10 CFR Part 72 be revised to permit GTCC waste to be stored at the ISFSI pending transfer to a permanent disposal facility. The petitioner suggested that, because the need to provide interim storage for GTCC waste is not specific to Trojan but is generic, the regulations in 10 CFR Part 72 should be amended to explicitly provide for storage of GTCC waste in a licensed ISFSI.\2\

\2\ Although the proposal to grant this petition is no longer needed for Trojan since the GTCC waste was shipped to the Hanford LLW site within the reactor vessel, the NRC believes that this rulemaking, if promulgated, will be useful for other reactor operators that need to store their GTCC waste.

The petitioner believes that storage of GTCC waste under 10 CFR Part 72 will ensure safe interim storage. This storage would provide for public health and safety and environmental protection as required for spent fuel located at an ISFSI or spent fuel and high-level waste stored at a Monitored Retrievable Storage Installation (MRS).

The specific changes proposed in the petition would explicitly include interim storage of GTCC waste within the Purpose, Scope, and Definitions sections of 10 CFR Part 72 in order to treat GTCC waste in a manner similar to that for spent nuclear fuel. The revised definitions would only apply to the interim storage of GTCC waste under the authority of 10 CFR Part 72.

If this rule is adopted in final form, the petition would be granted in part and denied in part. This proposed rule would grant the petitioner's request to authorize GTCC waste storage under a

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10 CFR Part 72 license, but as discussed later, uses a different approach.

Public Comments on the Petition

The notice of receipt of the petition for rulemaking invited interested persons to submit written comments concerning the petition. The NRC received six comment letters. Five comment letters were received from nuclear facilities and one from the Nuclear Energy Institute (NEI). NEI provided another letter on this subject directly to the NRC Chairman on February 2, 1999, and the NRC responded on March 25, 1999. The comments were reviewed and considered in the development of NRC's decision on this petition. These comments are available in the NRC Public Document Room.

All six commenters supported the petition. Two of the commenters (Sacramento Municipal Utility District and Yankee Atomic Electric Company) are currently decommissioning their reactors.

Draft Rulemaking Plan

As a result of the petition and the comment letters, the NRC developed a draft rulemaking plan to further consider the development of a rule that would meet the intent of the petition. In SECY-97-056, dated March 5, 1997, the NRC staff provided a draft rulemaking plan to the Commission outlining a rule that would modify 10 CFR Part 72 to allow storage of material, which when disposed of would be classified as GTCC waste, under the authority of 10 CFR Part 72 using the performance criteria of this part. As discussed in this draft rulemaking plan, currently licensees are authorized to store GTCC waste under the regulations in 10 CFR Part 30 and/or Part 70. Therefore, the draft rulemaking plan discussed adding an option to store GTCC waste under 10 CFR Part 72 while maintaining the existing option to store this waste using the authority of 10 CFR Parts 30 and 70. This plan was sent to the Agreement States for their comments on April 18, 1997. Four States provided comments--Illinois, New York, Texas, and Utah.

The draft rulemaking plan described how an ISFSI or an MRS might be regulated by both the NRC and an Agreement State (this is discussed in more detail in the Discussion section). The draft rulemaking plan did not require that the licensing jurisdiction for GTCC waste remain with NRC, but did suggest that Agreement States could voluntarily relinquish their licensing authority for GTCC waste stored at an ISFSI. The draft rulemaking plan specifically requested Agreement State input relative to their likelihood of voluntarily relinquishing their authority for licensing when an ISFSI or an MRS is used for storing GTCC waste.

Three of the four state commenters indicated that they were opposed to voluntarily relinquishing their authority and preferred to maintain their licensing authority for GTCC waste. One state supported the concept. One state commenter questioned that inefficiencies will result from Agreement State regulation of GTCC waste at a reactor site concurrent with NRC regulation of spent fuel remaining at the site. The commenter noted that similar situations already exist when LLW is stored at the site. Another state commenter noted that there ``* * * have been many instances where an agreement state and NRC have effectively collaborated in the regulation of a single facility.'' Another state commenter noted that the NRC recently informed the states that they could voluntarily relinquish their authority for sealed sources and devices and it was ``* * *vehemently opposed to any rule that automatically usurps a state's licensing authority without the State's consent.''

Discussion

Current NRC regulations are not clear on the acceptability of storing reactor-related GTCC waste co-located at an ISFSI or an MRS. Co-location is the storage of spent fuel and other radioactive material in their respective separate containers. This situation has created confusion and uncertainty on the part of decommissioning reactor licensees and may create inefficiency and inconsistency in the way the NRC handles GTCC waste licensing matters.

Currently, 10 CFR Part 50 licensees (Domestic Licensing of Production and Utilization Facilities) are authorized to store all types of reactor-related radioactive materials, including material that, when disposed of, would be classified as GTCC waste. The GTCC waste portion is currently being stored either within the reactor vessel, in the spent fuel pool, or in a radioactive material storage area, pending development of a suitable permanent disposal facility. Reactor-related GTCC waste is typically in a solid form (i.e., mostly activated metals) such as reactor vessel internals, nozzles, and in- core instrumentation. A small amount of GTCC waste may also be in the form of a

sealed source that was used during the operation of the reactor. GTCC waste may consist of either byproduct material or special nuclear material. The authority to license the possession and storage of GTCC waste is contained within 10 CFR Part 30 for byproduct material and in 10 CFR Part 70 for special nuclear material. Under 10 CFR 50.52, the Commission may combine multiple licensing activities of an applicant that would otherwise be licensed individually in single licenses. Thus, the 10 CFR Part 50 license authorizing operation of production and utilization facilities currently includes, within it, the authorization to possess byproduct and special nuclear material that would otherwise need to be separately licensed under 10 CFR Parts 30 or 70.

Under current regulations, while a 10 CFR Part 50 license is in effect, a reactor licensee can store spent fuel generated at the reactor site under either a general license pusuant to 10 CFR 72.210 or a specific license pursuant to 10 CFR Part 72. In addition, the reactor licensee who has a 10 CFR Part 50 license, can store GTCC waste generated at the reactor site under the 10 CFR Parts 30 and 70 authority included in the 10 CFR Part 50 license.

Under current regulations, when the 10 CFR Part 50 license terminates, a reactor licensee can continue to store spent fuel generated at the reactor site under a specific license pursuant to 10 CFR Part 72. However, a general license under 10 CFR 72.210 would terminate because the 10 CFR Part 50 license has terminated, and the reactor licensee would need to apply for a specific license under 10 CFR Part 72 in order to continue to store spent fuel at the reactor site. Furthermore, the 10 CFR Parts 30 and 70 licenses included in the 10 CFR Part 50 licenses are also terminated when the 10 CFR Part 50 license terminates and the reactor licensee can only store GTCC waste by applying for a specific NRC license under 10 CFR Parts 30 and/or 70, or an equivalent Agreement State license if the facility is located in an Agreement State.

Under the proposed regulations, when a 10 CFR Part 50 license is terminated, the reactor licensee will only apply for an NRC license, but will have the option to store GTCC waste under either 10 CFR Part 72 or under 10 CFR Parts 30 and 70. This proposed regulation maintains Federal jurisdiction for GTCC waste under either approach (10 CFR Part 72 or 10 CFR Parts 30 and 70).

The proposed changes in this rulemaking would allow a 10 CFR Part 72 specific licensee to co-locate reactor-related GTCC waste within an ISFSI or an MRS. Applicants for a specific license would be required to provide a Safety Analysis Report (SAR) which would describe how the GTCC waste would be stored. The SAR would

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describe how structures, systems, and components that are important to safety are properly designed to allow the storage of GTCC waste within an ISFSI or MRS. There are no separate design criteria for GTCC waste storage containers. Safe storage of GTCC waste will be governed by the provisions of 10 CFR Parts 20 and 72. The applicant shall ensure that the co-location of this radioactive material does not have an adverse affect on the safe storage of spent fuel and the operation of the ISFSI. Based on an acceptable review of the SAR, the NRC would issue a 10 CFR Part 72 specific license. Current 10 CFR Part 72 specific license holders would be required to submit an application to amend their 10 CFR Part 72 license, if they desire to store GTCC waste at their ISFSI.

Under existing regulations, storage of GTCC waste at an ISFSI after termination of the reactor licensee's 10 CFR Part 50 license could lead to (1) NRC regulating the spent fuel at an ISFSI and (2) Agreement States regulating GTCC waste at the same location. The NRC has exclusive regulatory authority over a reactor licensee's storage of all radioactive material both spent fuel and of GTCC waste during the term of the 10 CFR Part 50 license. Once the 10 CFR Part 50 license is terminated an Agreement State would have authority for any GTCC waste stored by the utility.

The NRC believes that decommissioning activities at commercial nuclear power plants will generate relatively small volumes of GTCC waste relative to the amount of spent fuel that exists at these sites. GTCC waste exceeds the concentration limits of radionuclides established for Class C in Secs. 61.55(a)(3)(ii), 61.55(a)(4)(iii), or 61.55(a)(5)(ii). GTCC waste is not generally acceptable for near- surface disposal at licensed low-level radioactive waste disposal facilities. There currently are no routine disposal options for GTCC waste. Because GTCC waste is unlikely to be disposed of at a LLW disposal site regulated under 10 CFR Part 61, the GTCC waste must be stored in the interim.

In general, reactor-related GTCC wastes can be grouped into two categories. The first is activated metals, irradiated metal components from nuclear reactors such as core shrouds, support plates, and core barrels. The second is process wastes such as filters and resins resulting from the operation and decommissioning of reactors. In

addition, there may be a small amount of GTCC waste generated from other activities associated with the reactor's operation (e.g., reactor start-up sources).

The Low-Level Radioactive Waste Policy Amendments Act of 1985 gave the Federal Government (U.S. Department of Energy (DOE)) the primary responsibility for developing a national strategy for disposal of GTCC waste. The Act also gave the NRC the licensing responsibility for a disposal facility for GTCC waste. Until a disposal facility is licensed, there is a need for interim storage of GTCC waste.

In the development of the proposed rule, the NRC has identified a potential policy issue associated with DOE's responsibility for the disposal of GTCC waste. Because DOE has not yet identified criteria or technical regulations for a disposal package for spent fuel or GTCC waste, the NRC is concerned that the commingling of spent fuel and GTCC waste (i.e., the two types of waste stored within the same cask) may be unacceptable for permanent disposal in the geologic repository. In such a case, the spent fuel and GTCC waste would need to be removed from the storage container before the spent fuel is placed in the geologic repository.

The NRC desires to formulate regulations which both reduce radiological exposure and costs associated with repackaging the spent fuel and GTCC waste into two separate containers. Therefore, information from DOE on disposal polices will be helpful in developing commingling storage criteria for 10 CFR Part 72 (and enable the NRC to preclude a storage option that would be unacceptable for permanent disposal). Allowing commingling may be a technically safe and economical use of spent fuel storage cask space. The NRC staff has already reviewed and concluded, on a case-by-case basis, that GTCC waste in certain specific components associated with, and integral to, spent fuel (e.g., burnable poison rod assemblies, control rod assemblies, and thimble plugs) can be safely stored in the same cask with spent fuel. For current and future reviews, the NRC has developed guidance for the storage of these specific components. The position in the proposed rule is to preclude commingling of other reactor-related GTCC waste not integral to the spent fuel assemblies.

The proposed rule also precludes storage of liquid GTCC waste under 10 CFR Part 72. However, there are alternatives for a 10 CFR Part 50 licensee that desires to terminate their license yet still possesses liquid GTCC waste. These alternatives include the licensee's submission of an application for a 10 CFR Part 30 or 70 license, with the appropriate conditions for storage of liquid GTCC waste, or the licensee's submission of a request for an exemption from the requirements of 10 CFR Part 72.

However, and as discussed below, the NRC is specifically requesting additional input from stakeholders, including DOE, to develop a more effective rulemaking. This includes commingling of GTCC waste and spent fuel (in an ISFSI) or spent fuel, high-level waste, and GTCC waste (in an MRS) and storage of potentially hazardous or liquid GTCC wastes.

Request for Public Input on Specific Issues

The Commission is seeking input from stakeholders on various technical topics associated with the storage of GTCC waste. Submit responses to these questions as identified in the ADDRESSES section listed above.

The storage of GTCC waste at an ISFSI or MRS presents safety and technical issues that differ from those previously addressed by the NRC for the storage of spent fuel. For example, some forms of GTCC waste may be susceptible to radiolytic or thermal decomposition. Consequently, the design of a container for the storage of GTCC waste would need to consider the generation of gas or other products. Furthermore, chemical, galvanic, or thermal interactions may occur between GTCC waste, spent fuel, and the cask internals for GTCC waste and spent fuel stored in the same cask (i.e, commingled).

Accordingly, the Commission is requesting comments from interested stakeholders on the following safety, technical or licensing issues. Guided by these comments, the Commission will consider these issues in the development of a final rule on the storage of GTCC waste under 10 CFR Part 72. Comments are not limited to the safety and technical issues listed below. Comments on proposed performance criteria for storage of GTCC waste are particularly requested. The performance criteria should ensure that systems, structures, and components (SSCs) which are important to safety will retain their ability to perform design functions during GTCC waste normal storage operations, anticipated occurrences, and accidents.

1. Should the storage of certain forms of GTCC waste and spent fuel in the same cask be prohibited? Or, should storage be permitted if performance criteria can be established? If so, what criteria should be used?

Note: As previously discussed, the NRC has already approved the storage of certain

Proposed Rulemaking for 10 CFR Part 72

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types of GTCC waste and spent fuel in the same cask on a case-by- case basis. The approved GTCC waste has typically been reactor core components, (e.g., thimble plugs, burnable poison rod assemblies, and control rod assemblies). In addition, the Commission is separately requesting information from DOE regarding DOE's position on the final disposal of commingled spent fuel and GTCC waste.

2. Should the storage of explosive, pyrophoric, combustible, or chemically reactive GTCC waste be prohibited in either commingled or separate GTCC casks? Or should storage be permitted if performance criteria can be established? If so, what criteria should be used?

3. Should the storage of GTCC that may generate or release gases via radiolytic or thermal decomposition, including flammable gases, be prohibited in either commingled or separate GTCC casks? Or should storage be permitted if performance criteria can be established? If so, what criteria should be used?

4. Should the storage of solid GTCC waste that may contain free liquid (e.g., dewatered resin) be prohibited in either commingled or separate GTCC casks? Or should storage be permitted if performance criteria can be established? If so, what criteria should be used?

5. Should the storage of liquid GTCC waste be prohibited in either commingled or separate GTCC casks? Or should storage be permitted if performance criteria can be established? If so, what criteria should be used?

6. If reactor licensees, after termination of their 10 CFR Part 50 license, elect to store reactor-related GTCC waste under the provisions of 10 CFR Parts 30/70, is additional guidance needed to provide a more efficient licensing process?

Proposed Regulatory Action

The NRC is proposing to modify 10 CFR Parts 72 and 150. The proposed changes to these parts are necessary to allow the interim storage of NRC-licensed reactor-related GTCC waste within an ISFSI or an MRS and to require that the licensing responsibility for this waste remain under Federal jurisdiction. This proposed action deals only with GTCC waste used or generated by a commercial power reactor licensed under 10 CFR Part 50 (i.e., not a research reactor) and does not include any other sources of GTCC waste nor does it include other forms of LLW generated under a 10 CFR Part 50 license. Because reactor- related GTCC waste is initially under Federal jurisdiction while the reactor facility is operated and the ultimate disposal of GTCC waste is also under Federal jurisdiction, the NRC believes that the interim period between termination of a reactor license and ultimate disposal should also remain under Federal jurisdiction. GTCC waste could become eligible for disposal in a geologic repository in the future. Spent fuel can be stored in an ISFSI or a MRS pending ultimate disposal. Therefore, for efficiency and consistency of licensing, the NRC believes that 10 CFR Part 72 should be modified to also allow the storage of GTCC waste within these facilities under NRC's jurisdiction. The existing regulatory scheme, which would allow for Federal-State- Federal jurisdiction over the generation, interim storage, and disposal of GTCC, waste is an inefficient approach. It is inefficient for NRC and an Agreement State to both spend scarce resources to license and inspect an ISFSI that stores both spent fuel and GTCC waste. Additionally, 10 CFR Part 150 would require conforming changes.

This proposed rule would allow storage of reactor-related GTCC waste under a 10 CFR Part 72 specific license. The proposed changes would modify 10 CFR Part 72 to allow storage of GTCC waste under this part using the performance criteria of 10 CFR Part 72 (General Design Criteria in Subpart F). This would provide a more efficient means of implementing what is essentially already permitted by the regulations (storage of GTCC waste co-located at an ISFSI or an MRS). When storing spent fuel and GTCC waste within an ISFSI or MRS, the licensee or applicant must provide a description of how storage of the GTCC waste will not have an adverse effect on the ISFSI or MRS or on public health and safety and the environment.

The proposed rule would not eliminate the current availability of storing GTCC waste under the authority of a 10 CFR Part 30 or 70 license. Neither 10 CFR Parts 30 nor 70 include explicit criteria for storage of GTCC waste. Therefore, a licensing process conducted under these regulations would be more complicated and resource intensive because the licensee would need to develop new proposed storage criteria and the NRC would then need to review and approve these criteria within the licensing process. If this approach is followed, the NRC is proposing that Federal jurisdiction would be retained over the reactor-related GTCC waste stored under 10 CFR Parts 30 and 70.

Comparing these two approaches, the NRC recognizes that the licensing process will be simpler with less regulatory burden if all the radioactive waste to be stored at an ISFSI or MRS is stored under the authority of one 10 CFR Part 72 license. 10 CFR Part 72 was developed specifically for storage of spent fuel at an ISFSI and spent fuel and high-level waste at an MRS. The general storage criteria of 10 CFR Part 72 will be applied to GTCC waste storage. Under 10 CFR Parts 30 and 70, GTCC waste storage criteria would need to be developed on a case-by-case basis to support licensing under these parts. Also, using 10 CFR Part 72 to store reactor-related GTCC waste would eliminate the need for multiple licenses for the storage of spent fuel and GTCC waste.

Moreover, the NRC is still evaluating technical issues arising from the commingling of spent fuel and reactor-related GTCC waste in the same storage container and issues arising from the storage of reactor- related liquid GTCC waste, under a 10 CFR Part 72 specific license. Therefore, this proposed rule would permit the co-locating of spent fuel and solid reactor-related GTCC waste in different casks and containers within an ISFSI or MRS. However, the proposed rule is not structured to permit the commingling of spent fuel and GTCC waste in the same storage cask, except for specific components associated with, and integral to, the spent fuel. Additionally, this proposed rule is not structured to permit the storage of liquid reactor-related GTCC waste. However, a licensee or applicant may submit an exemption request pursuant to Sec. 72.7 for approval for commingling of spent fuel and solid reactor-related GTCC waste in the same storage cask, or storing liquid reactor-related GTCC waste. The NRC will review and approve these types of requests on a case-by-case basis. As stated above, the NRC is still evaluating these technical issues and as noted earlier is asking for additional input during the public comment period for use in the development of the final rule.

Without this change, after termination of the 10 CFR Part 50 license, a licensee would need multiple licenses--10 CFR Part 72 for spent fuel and 10 CFR Part 30 or 70 (or both) for GTCC waste. Having one license for the ISFSI (or MRS) under 10 CFR Part 72 will be simpler for both licensees and the NRC, relative to approval and management.

The NRC believes that the concept proposed in the petition of storing GTCC waste under the provisions of 10 CFR Part 72 is valid. However, the NRC also believes that the method proposed by the petitioner, that is modifying the definition of spent fuel to include GTCC waste, could lead to confusion. Modifying the definition of spent fuel would only apply to spent fuel as

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defined under 10 CFR Part 72 and would not be technically accurate.

Therefore, the NRC is proposing to add a definition of GTCC waste within Sec. 72.3 that would be consistent with 10 CFR 61.55. The NRC has evaluated 10 CFR Part 72 to determine which sections need to be modified to accommodate storage of solid GTCC waste co-located with spent fuel within an ISFSI or an MRS. The majority of the changes to 10 CFR Part 72 would simply add the term ``GTCC waste'' to the appropriate sections and paragraphs (typically immediately after the terms ``spent fuel'' or ``high-level waste''). Section 72.120 would be revised to require that GTCC waste be in a solid form. The NRC anticipates issuing guidance on the storage of GTCC waste under 10 CFR Part 72 in conjunction with issuance of the final rule.

10 CFR Part 150 would be modified to be consistent with the changes proposed for 10 CFR Part 72. The proposed change to 10 CFR Part 150 (Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters Under Section 274) would specify that any GTCC waste stored in an ISFSI or an MRS is under NRC jurisdiction. This Part would also be modified to indicate that licensing the storage of any GTCC waste that originates in, or is used by, a facility licensed under 10 CFR Part 50 (a production utilization facility) is the responsibility of the NRC.

The NRC will continue to recover costs for generic activities related to the storage of GTCC waste under 10 CFR Part 72 through 10 CFR Part 171 annual fees assessed to the spent fuel storage/reactor decommissioning class of licensees. Subsequent to issuing the final revision to 10 CFR Part 72, 10 CFR Part 170 will be amended to clarify that full costs fees will be assessed for amendments and inspections related to the storage of GTCC waste under 10 CFR Part 72.

NRC To Maintain Authority for Reactor-Related GTCC Waste

Section 274(c)1 of the Atomic Energy Act of 1954, as amended, provides that no agreement entered into by the NRC with a State ``shall provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of--(1) the construction and operation of any production or utilization

facility or any uranium enrichment facility." The NRC has incorporated this statutory prohibition into its regulations in 10 CFR 150.15(a) and (a)(1) which states that:

(a) Persons in Agreement States are not exempt from the Commission's licensing and regulatory requirements with respect to the following activities:

(1) The construction and operation of any production or utilization facility. As used in this subparagraph, operation of a facility includes, but is not limited to

(i) the storage and handling of radioactive wastes at the facility site by the person licensed to operate the facility, and

(ii) the discharge of radioactive effluents from the facility site.

Specifically, with regard to the storage of reactor-related GTCC waste, the NRC proposes continued Federal authority over the GTCC waste after termination of the 10 CFR Part 50 license. Thus, under the option of obtaining 10 CFR Part 30 and/or 70 licenses, the GTCC waste would remain under Federal authority. If the option of obtaining a specific license under 10 CFR Part 72 is chosen, the GTCC waste would also remain under Federal authority. This licensing authority would be irrespective of the physical location of the storage facility (either on or off the originating reactor site).

However, this proposed rule is not intended to change other current responsibilities for Class A, B, and C reactor-related LLW after termination of the 10 CFR Part 50 license. In addition, under 10 CFR 72.128(b), any LLW generated by the ISFSI (or an MRS) must be treated and stored onsite awaiting transfer to a disposal site. The licensing authority for treatment and storage of ISFSI or MRS generated LLW would be under 10 CFR Part 72, and therefore, reserved to the NRC.

From a practical matter, the NRC believes that because, under section 3(b)(1)(D) of the Low-Level Radioactive Waste Policy Amendments Act of 1985, the NRC must license the facility selected by DOE for disposal of GTCC waste, and because the NRC has jurisdiction over GTCC waste while the 10 CFR Part 50 facility is operated, it makes little sense for Agreement States to assume regulatory authority and responsibility over reactor-related GTCC waste that is surrounded on all sides by Federal regulatory authority and responsibility.

Specific Changes in Regulatory Text

The following section is provided to assist the reader in understanding the specific changes made to each section or paragraph in 10 CFR Parts 72 and 150. For clarity of content in reading a section, much of that particular section may be repeated, although only a minor change would be made. Using this section should allow the reader to effectively review the specific changes without reviewing existing material that has been included for content, but has not been significantly changed.

The title to 10 CFR Part 72 would be revised to include GTCC waste.

The following sections or paragraphs would be revised to specify the inclusion of GTCC waste, for clarity, or for completeness: Secs. 72.1, 72.2(a) and (c), 72.6(a) and (c), 72.8, 72.16(d), 72.22(e)(3), 72.24 introductory text and (i), 72.28(d), 72.30(a), 72.40(b), 72.44(b)(4), (c)(3)(i), (c)(5), (d) and (g)(2), 72.52(b)(2), (c), and (e), 72.54(c)(1), 72.60(c), 72.72(a), (b), and (d), 72.75(b), (c), (d)(1)(iv), and (d)(2)(ii)(L), 72.76(a), 72.78(a), 72.80(g), 72.82(a) and (b), 72.106(b), 72.108 title and text, 72.122(b)(2), (h)(2), (h)(5), (i), and (l), 72.128 title and (a), and 72.140(c)(2).

Section 72.3: The definition for GTCC waste would be added to 10 CFR Part 72 and the definitions of Design capacity, Independent spent fuel storage installation or ISFSI, Monitored Retrievable Storage Installation or MRS, Spent fuel storage cask or cask, and Structures, systems, and components important to safety, would be revised to specify the inclusion of GTCC waste.

Paragraph 72.24(r): This new paragraph would specify compatibility and suitability of storage of reactor-related GTCC waste at an ISFSI or MRS. This requirement would ensure that the co-location of this radioactive material does not have an adverse affect on the safe storage of spent fuel and the operation of the facility.

Section 72.120: This section has been modified to provide some general considerations for the storage of GTCC waste within an ISFSI or MRS.

Paragraph 150.15(a)(7)(i) and (ii): This essentially repeats the existing paragraphs, but would be revised for consistency with the new Sec. 150.15(a)(7)(iii).

Paragraph 150.15(a)(7)(iii): This new paragraph would specify that the storage of reactor-related GTCC waste within an ISFSI or an MRS licensed pursuant to 10 CFR Part 50 and/or Part 72 is exempt from Agreement State authority.

Paragraph 150.15(a)(8): This new paragraph would specify that the storage of reactor-related GTCC waste licensed under 10 CFR Part 30 and/or Part 70 is exempt from Agreement State authority.

In the NRC's proposed rule, ``Clarification and Addition of Flexibility to Part 72'' (64 FR 59677; November 3, 1999), additional changes are being proposed to 10 CFR Part 72. Some of the sections being revised by the ``Clarification'' rulemaking may also be changed to specify the inclusion of GTCC waste depending upon how this rule is finalized. The changes proposed in this rulemaking are based upon the

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current 10 CFR Part 72 text. The final GTCC rulemaking will incorporate necessary conforming changes based on the final ``Clarification'' rulemaking.

Compatibility of Agreement State Regulations

Under the ``Policy Statement on Adequacy and Compatibility of Agreement State Programs'' approved by the Commission on June 30, 1997, and published in the Federal Register on September 3, 1997 (62 FR 46517), 10 CFR Part 72 and Sec. 150.15 continue to be classified as compatibility Category ``NRC.'' The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the Atomic Energy Act of 1954, as amended, or provisions of Title 10 of the Code of Federal Regulations.

The Commission is particularly interested in the position of the Agreement States on issues raised in this proposed rule. Specifically, the Commission would like Agreement State comment on the following questions:

1. What is the position of the Agreement States on NRC assuming jurisdiction of storage of GTCC waste generated during the operation of a 10 CFR Part 50 license after termination of the 10 CFR Part 50 license?

2. What controls and regulatory framework would the Agreement States envision assuming they have jurisdiction over GTCC waste generated during the operation under a 10 CFR Part 50 license after termination of the 10 CFR Part 50 license? How would the Agreement States plan to ensure consistency with a national regulatory scheme?

3. The NRC staff is not aware of any current Agreement State license for the storage of reactor-related GTCC waste. Are there any such licenses within your State or are you aware of any such Agreement State licenses?

Plain Language

The Presidential Memorandum dated June 1, 1998, entitled, ``Plain Language in Government Writing,'' directed that the Federal government's writing be in plain language. This memorandum was published June 10, 1998 (63 FR 31883). In complying with this directive, editorial changes have been made in the proposed revision to improve the organization and readability of the existing language of paragraphs being revised. These types of changes are not discussed further in this document. The NRC requests comments on the proposed rule specifically with respect to the clarity and effectiveness of the language used. Comments should be sent to the address listed under the ADDRESSES heading.

Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Pub. L. 104-113, requires that agencies use technical standards that are developed or adopted by voluntary consensus standard bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this proposed rule, the NRC is presenting amendments to its regulations that would allow the licensing of interim storage of GTCC waste. This action does not constitute the establishment of a standard that establishes generally-applicable requirements and the use of a voluntary consensus standard is not applicable.

Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that this rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment, and therefore, an environmental impact statement is not required. The proposed rule would provide reactor licensees an additional option of storing GTCC

waste under a 10 CFR Part 72 license using spent fuel storage criteria of that part. Storage of GTCC waste at an ISFSI or an MRS would be in a passive mode with no human intervention needed for safe storage. The draft Environmental Assessment determined that there is no significant environmental impact as a result of the proposed changes.

The NRC has sent a copy of the draft environmental assessment and this proposed rule to every State Liaison Officer and every Agreement State and requested their comments on the environmental assessment. The draft environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the environmental assessment and the finding of no significant impact are available from Mark Haisfield, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-6196.

Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). This rule has been submitted to the Office of Management and Budget for review and approval of the information collection requirements.

The public reporting burden for this information collection is estimated to average 120 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. The U.S. Nuclear Regulatory Commission is seeking public comment on the potential impact of the information collections contained in the proposed rule and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?

2. Is the estimate of burden accurate?

3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?

4. How can the burden of the information collection be minimized, including the use of automated collection techniques?

Send comments on any aspect of this proposed information collection, including suggestions for reducing the burden, to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail at BJS1@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0132), Office of Management and Budget, Washington, DC 20503.

Comments to OMB on the information collections or on the above issues should be submitted by July 17, 2000. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after this date.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

Regulatory Analysis

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The draft analysis is available for inspection

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in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the draft analysis may be obtained from Mark Haisfield, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-6196.

The Commission requests public comment on the draft regulatory analysis. Comments on the draft analysis may be submitted to the NRC as indicated under the ADDRESSES heading.

Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule, if adopted, will not have a significant economic impact upon a substantial number of small entities. The proposed amendments would apply to reactor licensees, ISFSI licensees, certificate holders, applicants for a Certificate of Compliance, and DOE. The majority, if not all, of these licensees would not qualify as small entities under the NRC's size standards (10 CFR 2.810).

Any small entity subject to this regulation which determines that, because of its size, it is likely to bear a disproportionate adverse economic impact should notify the Commission of this in a comment that indicates the following:

(a) The licensee's size and how the proposed regulation would result in a significant economic burden upon the licensee as compared to the economic burden on a larger licensee.

(b) How the proposed regulations could be modified to take into account the licensee's differing needs or capabilities.

(c) The benefits that would accrue, or the detriments that would be avoided, if the proposed regulations were modified as suggested by the licensee.

(d) How the proposed regulation, as modified, would more closely equalize the impact of regulations or create more equal access to the benefits of Federal programs as opposed to providing special advantages to any individual or group.

(e) How the proposed regulation, as modified, would still adequately protect public health and safety.

Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109 and 72.62, do not apply to this proposed rule, and therefore, a backfit analysis is not required because these amendments do not involve any provisions that would impose backfits as defined in 10 CFR 50.109(a)(1) or 72.62(a). This proposed rule would not require licensees to use 10 CFR Part 72 to store GTCC waste. It provides a practical option with criteria that licensees may use. It does not preclude, or change, use of 10 CFR Parts 30 and 70 as a licensing mechanism to store GTCC waste. The NRC anticipates that storage of GTCC waste licensed under 10 CFR Part 72 can simplify the licensing process, for both licensees and the NRC, with no significant impact to public health and safety or the environment.

List of Subjects

10 CFR Part 72

Criminal penalties, Manpower training programs, Nuclear materials, Occupational safety and health, Reporting and recordkeeping requirements, Security measures, Spent fuel.

10 CFR Part 150

Criminal penalties, Hazardous materials transportation, Intergovernmental relations, Nuclear materials, Reporting and recordkeeping requirements, Security measures, Source material, Special nuclear material.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR Parts 72 and 150.

PART 72--LICENSING REQUIREMENTS FOR THE INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL, HIGH-LEVEL RADIOACTIVE WASTE, AND REACTOR- RELATED GREATER THAN CLASS C WASTE

1. The heading of Part 72 is revised to read as presented above:

2. The authority citation for Part 72 continues to read as follows:

Authority: Secs. 51, 53, 57, 62, 63, 65, 69, 81, 161, 182, 183, 184, 186, 187, 189, 68 Stat. 929, 930, 932, 933, 934, 935, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2071, 2073, 2077, 2092, 2093, 2095, 2099, 2111, 2201, 2232, 2233, 2234, 2236, 2237, 2238, 2282); sec. 274, Pub. L. 86-373, 73 Stat. 688, as amended (42 U.S.C. 2021); sec. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); Pub. L. 95-601, sec. 10, 92 Stat. 295 as amended by Pub. L. 102-486, sec 7902, 106 Stat. 3123

(42 U.S.C. 5851); sec. 102, Pub. L. 91-190, 83 Stat. (42 U.S.C. 4332); secs. 131, 132, 133, 135, 137, 141, Pub. L. 97-425, 96 Stat. 2229, 2230, 2232, 2241, sec. 148, Pub. L. 100- 203, 101 Stat. 1330-235 (42 U.S.C. 10151, 10152, 10153, 10155, 10157, 10161, 10168).

Section 72.44(g) also issued under secs. 142(b) and 148(c), (d), Pub. L. 100-203, 101 Stat. 1330-232, 1330-236 (42 U.S.C. 10162(b), 10168(c), (d). Section 72.46 also issued under sec. 189, 68 Stat. 935 (42 U.S.C. 2239); sec. 134, Pub. L. 97-425, 96 Stat. 2230 (42 U.S.C. 10154). Section 72.96(d) also issued under sec. 145(g), Pub. L. 100-203; 101 Stat. 1330-235 (42 U.S.C. 10165(g)). Subpart J also issued under secs. 2(2), 2(15), 2(19), 117(a), 141(h), Pub. L. 97- 425, 96 Stat. 2202, 2203, 2204, 2222, 2244 (42 U.S.C. 10101, 10137(a), 10161(h). Subparts K and L are also issued under sec. 133, 96 Stat. 2230 (42 U.S.C. 10153) and sec. 218(a), 96 Stat. 2252 (42 U.S.C. 10198).

3. Section 72.1 is revised to read as follows:

Sec. 72.1 Purpose.

The regulations in this part establish requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel, power reactor-related greater than class C (GTCC) waste, and other radioactive materials associated with spent fuel storage in an independent spent fuel storage installation (ISFSI) and the terms and conditions under which the Commission will issue these licenses. The regulations in this part also establish requirements, procedures, and criteria for the issuance of licenses to the Department of Energy (DOE) to receive, transfer, package, and possess power reactor spent fuel, high-level radioactive waste, power reactor-related GTCC waste, and other radioactive materials associated with the storage of these materials in a monitored retrievable storage installation (MRS). The term Monitored Retrievable Storage Installation or MRS, as defined Sec. 72.3, is derived from the NWPA and includes any installation that meets this definition. The regulations in this part also establish requirements, procedures, and criteria for the issuance of Certificates of Compliance approving spent fuel storage cask designs.

4. Section 72.2 is amended by revising paragraphs (a) and (c) to read as follows:

Sec. 72.2 Scope.

(a) Except as provided in Sec. 72.6(b), licenses issued under this part are limited to the receipt, transfer, packaging, and possession of:

(1) Power reactor spent fuel and power reactor-related GTCC waste to be stored in a complex that is designed and constructed specifically for storage of power reactor spent fuel aged for at least one year, reactor-related GTCC waste in a solid form, and other radioactive materials associated with spent fuel storage in an independent spent fuel storage installation (ISFSI); or

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(2) Power reactor spent fuel and power reactor-related GTCC waste to be stored in a monitored retrievable storage installation (MRS) owned by DOE that is designed and constructed specifically for the storage of spent fuel aged for at least one year, high-level radioactive waste that is in a solid form, reactor-related GTCC waste that is in a solid form, and other radioactive materials associated with storage of these materials. * * * * *

(c) The requirements of this regulation are applicable, as appropriate, to both wet and dry modes of storage of--

(1) Spent fuel and solid reactor-related GTCC waste in an independent spent fuel storage installation (ISFSI); and

(2) Spent fuel, solid high-level radioactive waste, and solid reactor-related GTCC waste in a monitored retrievable storage installation (MRS). * * * * *

5. Section 72.3 is amended by adding a definition, in its proper alphabetic order, of the term Greater than class C waste, and revising the definitions of Design capacity, Independent spent fuel storage installation or ISFSI, Monitored Retrievable Storage Installation or MRS, Spent fuel storage cask or cask, and Structures, systems, and components important to safety, to read as follows:

Sec. 72.3 Definitions.

* * * * *

Design capacity means the quantity of spent fuel, high-level radioactive waste, or reactor-related GTCC waste, the maximum burn up of the spent fuel in MWD/MTU, the terabequerel (curie) content of the waste, and the total heat generation in Watts (btu/hour) that the storage installation is designed to accommodate. * * * * *

Greater than class C waste or GTCC waste means low-level radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in Sec. 61.55 of this chapter. * * * * *

Independent spent fuel storage installation or ISFSI means a complex designed and constructed for the interim storage of spent nuclear fuel, solid reactor-related GTCC waste, and other radioactive materials associated with spent fuel and reactor-related GTCC waste storage. An ISFSI which is located on the site of another facility licensed under this part or a facility licensed under Part 50 of this chapter and which shares common utilities and services with that facility or is physically connected with that other facility may still be considered independent. * * * * *

Monitored Retrievable Storage Installation or MRS means a complex designed, constructed, and operated by DOE for the receipt, transfer, handling, packaging, possession, safeguarding, and storage of spent nuclear fuel aged for at least one year, solidified high-level radioactive waste resulting from civilian nuclear activities, and solid reactor-related GTCC waste, pending shipment to a HLW repository or other disposal. * * * * *

Spent fuel storage cask or cask means all the components and systems associated with the container in which spent fuel, other radioactive materials associated with spent fuel, or reactor-related GTCC waste are stored in an ISFSI. * * * * *

Structures, systems, and components important to safety means those features of the ISFSI, MRS, and spent fuel storage cask whose functions are--

(1) To maintain the conditions required to store spent fuel, high- level radioactive waste, or reactor-related GTCC waste safely;

(2) To prevent damage to the spent fuel, the high-level radioactive waste, or reactor-related GTCC waste container during handling and storage; or

(3) To provide reasonable assurance that spent fuel, high-level radioactive waste, or reactor-related GTCC waste can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public. * * * * *

6. Section 72.6 is amended by revising paragraphs (a) and (c) to read as follows:

Sec. 72.6 License required; types of licenses.

(a) Licenses for the receipt, handling, storage, and transfer of spent fuel, high-level radioactive waste, or reactor-related GTCC waste are of two types: general and specific. Any general license provided in this part is effective without the filing of an application with the Commission or the issuance of a licensing document to a particular person. A specific license is issued to a named person upon application filed under the regulations in this part. * * * * *

(c) Except as authorized in a specific license and in a general license under subpart K of this part issued by the Commission in accordance with the regulations in this part, no person may acquire, receive, or possess--

(1) Spent fuel or reactor-related GTCC waste for the purpose of storage in an ISFSI; or

(2) Spent fuel, high-level radioactive waste, radioactive material associated with high-level radioactive waste, or reactor-related GTCC waste for the purpose of storage in an MRS.

7. Section 72.8 is revised to read as follows:

Sec. 72.8 Denial of licensing by Agreement States.

Agreement States may not issue licenses covering the storage of spent fuel and reactor-related GTCC waste in an ISFSI or the storage of spent fuel, high-level radioactive waste, and reactor-related GTCC waste in an MRS.

8. Section 72.16 is amended by revising paragraph (d) to read as follows:

Sec. 72.16 Filing of application for specific license.

* * * * *

(d) Fees. The application, amendment, and renewal fees applicable to a license covering an ISFSI are those shown in Sec. 170.31 of this chapter. * * * * *

9. Section 72.22 is amended by revising paragraph (e)(3) to read as follows:

Sec. 72.22 Contents of application: General and financial information.

* * * * *

(e) * * *

(3) Estimated decommissioning costs, and the necessary financial arrangements to provide reasonable assurance before licensing, that decommissioning will be carried out after the removal of spent fuel, high-level radioactive waste, and/or reactor-related GTCC waste from storage.

10. Section 72.24 is amended by revising the introductory paragraph and paragraph (i) and adding a new paragraph (r) to read as follows:

Sec. 72.24 Contents of application: Technical information.

Each application for a license under this part must include a Safety Analysis Report describing the proposed ISFSI or MRS for the receipt, handling, packaging, and storage of spent fuel, high-level radioactive waste, and/or reactor-related GTCC waste as appropriate, including how the ISFSI or MRS will be operated. The minimum information to be included in this report must consist of the following: * * * * *

(i) If the proposed ISFSI or MRS incorporates structures, systems, or

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components important to safety whose functional adequacy or reliability have not been demonstrated by prior use for that purpose or cannot be demonstrated by reference to performance data in related applications or to widely accepted engineering principles, an identification of these structures, systems, or components along with a schedule showing how safety questions will be resolved prior to the initial receipt of spent fuel, high-level radioactive waste, and/or reactor-related GTCC waste as appropriate for storage at the ISFSI or MRS. * * * * *

(r) A description of the compatibility and suitability of the reactor-related GTCC waste with the ISFSI or MRS.

11. Section 72.28 is amended by revising paragraph (d) to read as follows:

Sec. 72.28 Contents of application: Applicant's technical qualifications.

* * * * *

(d) A commitment by the applicant to have and maintain an adequate complement of trained and certified installation personnel prior to the receipt of spent fuel, high-level radioactive waste, and/or reactor- related GTCC waste as appropriate for storage.

12. Section 72.30 is amended by revising paragraph (a) to read as follows:

Sec. 72.30 Financial assurance and recordkeeping for decommissioning.

(a) Each application under this part must include a proposed decommissioning plan that contains sufficient information on proposed practices and procedures for the decontamination of the site and facilities and for disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste has been removed, in order to provide reasonable assurance that the decontamination and decommissioning of the ISFSI or MRS at the end of its useful life will provide adequate protection to the health and safety of the public. This plan must identify and discuss those design features of the ISFSI or MRS that facilitate its decontamination and decommissioning at the end of its useful life. * * * * *

13. Section 72.40 is amended by revising paragraph (b) to read as follows:

Sec. 72.40 Issuance of license.

* * * * *

(b) A license to store spent fuel and reactor-related GTCC waste in the proposed ISFSI or to store spent fuel, high-level radioactive waste, and reactor-related GTCC waste in the proposed MRS may be denied if construction on the proposed facility begins before a finding approving issuance of the proposed license with any appropriate conditions to protect environmental values. * * * * *

14. Section 72.44 is amended by revising paragraphs (b)(4), (c)(3)(i), (c)(5), the introductory text of paragraph (d), and (g)(2) to read as follows:

Sec. 72.44 License conditions.

* * * * *

(b) * * *

(4) The licensee shall have an NRC-approved program in effect that covers the training and certification of personnel that meets the requirements of subpart I before the licensee may receive spent fuel and/or reactor-related GTCC waste for storage at an ISFSI or the receipt of spent fuel, high-level radioactive waste, and/or reactor- related GTCC waste for storage at an MRS. * * * * *

(c) * * *

(3) * * *

(i) Inspection and monitoring of spent fuel, high-level radioactive waste, or reactor-related GTCC waste in storage; * * * * *

(5) Administrative controls. Administrative controls include the organization and management procedures, recordkeeping, review and audit, and reporting requirements necessary to assure that the operations involved in the storage of spent fuel and reactor-related GTCC waste in an ISFSI and the storage of spent fuel, high-level radioactive waste, and reactor-related GTCC waste in an MRS are performed in a safe manner.

(d) Each license authorizing the receipt, handling, and storage of spent fuel, high-level radioactive waste, and/or reactor-related GTCC waste under this part must include technical specifications that, in addition to stating the limits on the release of radioactive materials for compliance with limits of part 20 of this chapter and the ``as low as is reasonably achievable" objectives for effluents, require that: * * * * *

(g) * * *

(2) Construction of the MRS or acceptance of spent nuclear fuel, high-level radioactive waste, and/or reactor-related GTCC waste at the MRS is prohibited during such time as the repository license is revoked by the Commission or construction of the repository ceases. * * * * *

15. Section 72.52 is amended by revising paragraphs (b)(2), (c), and (e) to read as follows:

Sec. 72.52 Creditor regulations.

* * * * *

(b) * * *

(2) That no creditor so secured may take possession of the spent fuel and/or reactor-related GTCC waste under the provisions of this section before --

(i) The Commission issues a license authorizing possession; or

(ii) The license is transferred.

(c) Any creditor so secured may apply for transfer of the license covering spent fuel and/or reactor-related GTCC waste by filing an application for transfer of the license under Sec. 72.50(b). The Commission will act upon the application under Sec. 72.50(c). * * * * *

(e) As used in this section, ``creditor" includes, without implied limitation --

(1) The trustee under any mortgage, pledge, or lien on spent fuel and/or reactor-related GTCC waste in storage made to secure any creditor;

(2) Any trustee or receiver of spent fuel and/or reactor-related GTCC waste appointed by a court of competent jurisdiction in any action brought for the benefit of any creditor secured by a mortgage, pledge, or lien;

(3) Any purchaser of the spent fuel and/or reactor-related GTCC waste at the sale thereof upon foreclosure of the mortgage, pledge, or lien or upon exercise of any power of sale contained therein; or

(4) Any assignee of any such purchaser.

16. Section 72.54 is amended by revising paragraph (c)(1) to read as follows:

Sec. 72.54 Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.

* * * * *

(c) * * *

(1) Limit actions involving spent fuel, reactor-related GTCC waste, or other licensed material to those related to decommissioning; and * * * * *

17. Section 72.60 is amended by revising paragraph (c) to read as follows:

Sec. 72.60 Modification, revocation, and suspension of license.

* * * * *

(c) Upon revocation of a license, the Commission may immediately cause the retaking of possession of all special nuclear material contained in spent fuel and/or reactor-related GTCC waste held by the licensee. In cases found by the Commission to be of extreme

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importance to the national defense and security or to the health and safety of the public, the Commission may cause the taking of possession of any special nuclear material contained in spent fuel and/or reactor- related GTCC waste held by the licensee before following any of the procedures provided under sections 551-558 of title 5 of the United States Code.

18. Section 72.72 is amended by revising paragraphs (a), (b), and (d) to read as follows:

Sec. 72.72 Material balance, inventory, and records requirements for stored materials.

(a) Each licensee shall keep records showing the receipt, inventory (including location), disposal, acquisition, and transfer of all spent fuel, high-level radioactive waste, and reactor-related GTCC waste containing special nuclear material in storage. The records must include as a minimum the name of shipper of the material to the ISFSI or MRS, the estimated quantity of radioactive material per item (including special nuclear material in spent fuel and reactor-related GTCC waste), item identification and seal number, storage location, onsite movements of each fuel assembly or storage canister, and ultimate disposal. These records for spent fuel and reactor-related GTCC waste at an ISFSI or for spent fuel, high-level radioactive waste, and reactor-related GTCC waste at an MRS must be retained for as long as the material is stored and for a period of five years after the material is disposed of or transferred out of the ISFSI or MRS.

(b) Each licensee shall conduct a physical inventory of all spent fuel, high-level radioactive waste, and reactor-related GTCC waste containing special nuclear material in storage at intervals not to exceed 12 months unless otherwise directed by the Commission. The licensee shall retain a copy of the current inventory as a record until the Commission terminates the license. * * * * *

(d) Records of spent fuel, high-level radioactive waste, and reactor-related GTCC waste containing special nuclear material in storage must be kept in duplicate. The duplicate set of records must be kept at a separate location sufficiently remote from the original records that a single event would not destroy both sets of records. Records of spent fuel or reactor-related GTCC waste containing special nuclear material transferred out of an ISFSI or of spent fuel, high- level radioactive waste, or reactor-related GTCC waste containing special nuclear material transferred out of an MRS must be preserved for a period of five years after the date of transfer.

19. Section 72.75 is amended by revising the introductory text of paragraphs (b) and (c), paragraphs (b)(2), (b)(3), (b)(6), (d)(1)(iv), and (d)(2)(ii)(L) to read as follows:

Sec. 72.75 Reporting requirements for specific events and conditions.

* * * * *

(b) Non-emergency notifications: Four-hour reports. Each licensee shall notify the NRC as soon as possible but not later than 4 hours after the discovery of any of the following events or conditions involving spent fuel, HLW, or reactor-related GTCC waste: * * * * *

(2) A defect in any storage structure, system, or component which is important to safety.

(3) A significant reduction in the effectiveness of any storage confinement system during use. * * * * *

(6) An unplanned fire or explosion damaging any spent fuel, HLW, and/or reactor-related GTCC waste, or any device, container, or equipment containing spent fuel, HLW, and/or reactor-related GTCC waste when the damage affects the integrity of the material or its container.

(c) Non-emergency notifications: Twenty-four hour reports. Each licensee shall notify the NRC within 24 hours after the discovery of any of the following events involving spent fuel, HLW, or reactor- related GTCC waste: * * * * *

(d) * * *

(1) * * *

(iv) The quantities, and chemical and physical forms of the spent fuel, HLW, or reactor-related GTCC waste involved; and * * * * *

(2) * * *

(ii) * * *

(L) The quantities and chemical and physical forms of the spent fuel, HLW, or reactor-related GTCC waste involved;

* * * * *

20. Section 72.76 is amended by revising paragraph (a) to read as follows:

Sec. 72.76 Material status reports.

(a) Except as provided in paragraph (b) of this section, each licensee shall complete, in computer-readable format, and submit to the Commission a material status report in accordance with instructions (NUREG/BR-0007 and NMMSS Report D-24 ``Personal Computer Data Input for NRC Licensees''). Copies of these instructions may be obtained from the U.S. Nuclear Regulatory Commission, Division of Fuel Cycle Safety and Safeguards, Washington, DC 20555 -0001. These reports provide information concerning the special nuclear material contained in the spent fuel and reactor-related GTCC waste possessed, received, transferred, disposed of, or lost by the licensee. Material status reports must be made as of March 31 and September 30 of each year and filed within 30 days after the end of the period covered by the report. The Commission may, when good cause is shown, permit a licensee to submit material status reports at other times. The Commission's copy of this report must be submitted to the address specified in the instructions. These prescribed computer-readable forms replace the DOE/ NRC Form 742 which has been previously submitted in paper form. * * * * *

21. Section 72.78 is amended by revising paragraph (a) to read as follows:

Sec. 72.78 Nuclear material transfer reports.

(a) Except as provided in paragraph (b) of this section, whenever the licensee transfers or receives spent fuel or GTCC waste containing special nuclear material, the licensee shall complete in computer- readable format a Nuclear Material Transaction Report in accordance with instructions (NUREG/BR-0006 and NMMSS Report D-24, ``Personal Computer Data Input for NRC Licensees''). Copies of these instructions may be obtained from the U.S. Nuclear Regulatory Commission, Division of Fuel Cycle Safety and Safeguards, Washington, DC 20555-0001. Each ISFSI licensee who receives spent fuel from a foreign source shall complete both the supplier's and receiver's portion of the Nuclear Material Transaction Report, verify the identity of the spent fuel, and indicate the results on the receiver's portion of the form. These prescribed computer-readable forms replace the DOE/NRC Form 741 which has been previously submitted in paper form. * * * * *

22. Section 72.80 is amended by revising paragraph (g) to read as follows:

Sec. 72.80 Other records and reports.

* * * * *

(g) Each specific licensee shall notify the Commission, in accordance with Sec. 72.4, of its readiness to begin operation at least 90 days prior to the first storage of spent fuel, high-level waste, or reactor-related GTCC waste in an ISFSI or MRS.

23. Section 72.82 is amended by revising paragraphs (a) and (b) to read as follows:

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Sec. 72.82 Inspections and tests.

(a) Each licensee under this part shall permit duly authorized representatives of the Commission to inspect its records, premises, and activities and of spent fuel, high-level radioactive waste, or reactor- related GTCC waste in its possession related to the specific license as may be necessary to meet the objectives of the Act, including section 105 of the Act.

(b) Each licensee under this part shall make available to the Commission for inspection, upon reasonable notice, records kept by the licensee pertaining to its receipt, possession, packaging, or transfer of spent fuel, high-level radioactive waste, or reactor-related GTCC waste. * * * * *

24. Section 72.106 is amended by revising paragraph (b) to read as follows:

Sec. 72.106 Controlled area of an ISFSI or MRS.

* * * * *

(b) Any individual located on or beyond the nearest boundary of the controlled area may not receive from any design basis accident the more limiting of a total effective dose equivalent of 0.05 Sv (5 rem), or the sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) of 0.5 Sv (50 rem). The lens dose equivalent may not exceed 0.15 Sv (15 rem) and the shallow dose equivalent to skin or any extremity may not exceed 0.5 Sv (50 rem). The minimum distance from the spent fuel, high- level radioactive waste, or reactor-related GTCC waste handling and storage facilities to the nearest boundary of the controlled area must be at least 100 meters. * * * * *

25. Section 72.108 is revised to read as follows:

Sec. 72.108 Spent fuel, high-level radioactive waste, or reactor- related greater than class C waste transportation.

The proposed ISFSI or MRS must be evaluated with respect to the potential impact on the environment of the transportation of spent fuel, high-level radioactive waste, or reactor-related GTCC waste within the region.

26. Section 72.120 is revised to read as follows:

Sec. 72.120 General considerations.

(a) As required by Sec. 72.24, an application to store spent fuel or reactor-related GTCC waste in an ISFSI or to store spent fuel, high- level radioactive waste, or reactor-related GTCC waste in an MRS must include the design criteria for the proposed storage installation. These design criteria establish the design, fabrication, construction, testing, maintenance and performance requirements for structures, systems, and components important to safety as defined in Sec. 72.3. The general design criteria identified in this subpart establish minimum requirements for the design criteria for an ISFSI or MRS. Any omissions in these general design criteria do not relieve the applicant from the requirement of providing the necessary safety features in the design of the ISFSI or MRS.

(b) The ISFSI must be designed to store spent fuel and/or solid reactor-related GTCC waste. Liquid reactor-related GTCC wastes may not be received or stored in an ISFSI. If the ISFSI is a water-pool type facility, the reactor-related GTCC waste must be in a durable solid form with demonstrable leach resistance.

(c) The MRS must be designed to store spent fuel, solid high-level radioactive waste, and/or solid reactor-related GTCC waste. Liquid high-level radioactive wastes or liquid reactor-related GTCC wastes may not be received or

stored in an MRS. If the MRS is a water-pool type facility, the high-level waste and reactor-related GTCC waste must be in a durable solid form with demonstrable leach resistance.

(d) The ISFSI or MRS must be designed, made of materials, and constructed to ensure that there will be no significant chemical, galvanic, or other reactions between or among the storage system components, spent fuel, reactor-related GTCC waste, and/or high level waste including possible reaction with water during wet loading and unloading operations or during storage in a water-pool type ISFSI or MRS. The behavior of materials under irradiation and thermal conditions must be taken into account.

27. Section 72.122 is amended by revising paragraphs (b)(2), (h)(2), (h)(5), (i) and (l) to read as follows:

Sec. 72.122 Overall requirements.

* * * * *

(b) * * *

(2)(i) Structures, systems, and components important to safety must be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, lightning, hurricanes, floods, tsunami, and seiches, without impairing their capability to perform their intended design functions. The design bases for these structures, systems, and components must reflect:

(A) Appropriate consideration of the most severe of the natural phenomena reported for the site and surrounding area, with appropriate margins to take into account the limitations of the data and the period of time in which the data have accumulated, and

(B) Appropriate combinations of the effects of normal and accident conditions and the effects of natural phenomena.

(ii) The ISFSI or MRS should also be designed to prevent massive collapse of building structures or the dropping of heavy objects as a result of building structural failure on the spent fuel, high-level radioactive waste, or reactor-related GTCC waste or on to structures, systems, and components important to safety. * * * * *

(h) * * *

(2) For underwater storage of spent fuel, high-level radioactive waste, or reactor-related GTCC waste in which the pool water serves as a shield and a confinement medium for radioactive materials, systems for maintaining water purity and the pool water level must be designed so that any abnormal operations or failure in those systems from any cause will not cause the water level to fall below safe limits. The design must preclude installations of drains, permanently connected systems, and other features that could, by abnormal operations or failure, cause a significant loss of water. Pool water level equipment must be provided to alarm in a continuously manned location if the water level in the storage pools falls below a predetermined level. * * * * *

(5) The high-level radioactive waste and reactor-related GTCC waste must be packaged in a manner that allows handling and retrievability without the release of radioactive materials to the environment or radiation exposures in excess of Part 20 limits. The package must be designed to confine the high-level radioactive waste for the duration of the license.

(i) Instrumentation and control systems. Instrumentation and control systems for wet spent fuel and reactor-related GTCC waste storage must be provided to monitor systems that are important to safety over anticipated ranges for normal operation and off-normal operation. Those instruments and control systems that must remain operational under accident conditions must be identified in the Safety Analysis Report. Instrumentation systems for dry storage casks must be provided in accordance with cask design requirements to monitor

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conditions that are important to safety over anticipated ranges for normal conditions and off-normal conditions. Systems that are required under accident conditions must be identified in the Safety Analysis Report. * * * * *

(l) Retrievability. Storage systems must be designed to allow ready retrieval of spent fuel, high-level radioactive waste, and reactor- related GTCC waste for further processing or disposal.

28. Section 72.128 is amended by revising the heading and the introductory text of paragraph (a) to read as follows:

Sec. 72.128 Criteria for spent fuel, high-level radioactive waste, reactor-related greater than class C waste, and other radioactive waste storage and handling.

(a) Spent fuel, high-level radioactive waste, and reactor-related GTCC waste storage and handling systems. Spent fuel storage, high-level radioactive waste storage, reactor-related GTCC waste storage and other systems that might contain or handle radioactive materials associated with spent fuel, high-level radioactive waste, or reactor-related GTCC waste, must be designed to ensure adequate safety under normal and accident conditions. These systems must be designed with-- * * * * *

29. Section 72.140 is amended by revising paragraph (c)(2) to read as follows:

Sec. 72.140 Quality assurance requirements.

* * * * *

(c) * * *

(2) Each licensee shall obtain Commission approval of its quality assurance program prior to receipt of spent fuel and/or reactor-related GTCC waste at the ISFSI or spent fuel, high-level radioactive waste, and/or reactor-related GTCC waste at the MRS. * * * * *

PART 150--EXEMPTIONS AND CONTINUED REGULATORY AUTHORITY IN AGREEMENT STATES AND IN OFFSHORE WATERS UNDER SECTION 274

30. The authority citation for Part 150 continues to read as follows:

Authority: Sec. 161, 68 Stat. 948, as amended, sec. 274, 73 Stat. 688 (42 U.S.C. 2201, 2021); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).

Sections 150.3, 150.15, 150.15a, 150.31, 150.32 also issued under secs. 11e(2), 81, 68 Stat. 923, 935, as amended, secs. 83, 84, 92 Stat. 3033, 3039 (42 U.S.C. 2014e(2), 2111, 2113, 2114). Section 150.14 also issued under sec. 53, 68 Stat. 930, as amended (42 U.S.C. 2073). Section 150.15 also issued under secs. 135, 141, Pub. L. 97-425, 96 Stat. 2232, 2241 (42 U.S.C. 10155, 10161). Section 150.17a also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 150.30 also issued under sec. 234, 83 Stat. 444 (42 U.S.C. 2282).

31. Section 150.15 is amended by revising paragraph (a)(7) and adding a new paragraph (a)(8) to read as follows:

Sec. 150.15 Persons not exempt.

(a) * * *

(7) The storage of:

(i) Spent fuel in an independent spent fuel storage installation (ISFSI) licensed under Part 72 of this chapter,

(ii) Spent fuel and high-level radioactive waste in a monitored retrievable storage installation (MRS) licensed under Part 72 of this chapter, or

(iii) Greater than class C waste, as defined in Part 72 of this chapter. In an ISFSI or MRS licensed under Part 72 of this chapter, the GTCC waste must originate in, or be used by, a facility licensed under Part 50 of this chapter.

(8) Greater than class C waste, as defined in Part 72 of this chapter, that originates in, or be used by, a facility licensed under Part 50 of this chapter and is licensed under Part 30 and/or Part 70 of this chapter. * * * * *

Dated at Rockville, Maryland, this 9th day of June, 2000.

For the Nuclear Regulatory Commission. Annette L. Vietti-Cook, Secretary of the Commission. [FR Doc. 00-15054 Filed 6-15-00; 8:45 am]

C
NEI RESPONSE TO NRC PROPOSED RULE

NUCLEAR ENERGY INSTITUTE

Lynnette Hendricks
DIRECTOR, PLANT SUPPORT
NUCLEAR GENERATION

Filed Electronically

August 30, 2000

Ms. Annette Vietti-Cook
Secretary
Attention: Rulemakings and Adjudication's Staff
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Industry Comments in Support of Proposed Rule, "Interim Storage for Greater Than Class C Waste" (GTCC) (F.R. Vol. 65, Number 117, June 16, 2000)

Dear Ms. Vietti-Cook

The Nuclear Energy Institute (NEI) appreciates the opportunity to provide comments on behalf of the nuclear industry on "Interim Storage for Greater Than Class C Waste (GTCC)." As proposed, the rulemaking would allow licensing for interim storage of "spent fuel associated material" and reactor related GTCC waste in a manner that is consistent with licensing for interim storage of spent fuel. The rule also would maintain Federal jurisdiction for storage of spent fuel associated material and reactor-related GTCC waste, and would simplify and clarify the licensing process. The industry commends the NRC for taking this needed regulatory action.

In our view the rulemaking proposes two separate and distinct but equally important actions. The first action proposed is to permit, on a generic basis, the co-location and co-mingling (in the same cask) of spent fuel and "spent fuel associated material" at an Independent Spent Fuel Storage Installation (ISFSI) or Monitored Retrievable Storage Installation (MRS). The second action is to allow co-location of reactor-related GTCC waste within an ISFSI or MRS.

Currently, licensees are authorized on a case-by-case basis to store spent fuel and associated materials (i.e, the non-fuel components associated with those fuel assemblies) at an ISFSI or MRS under 10 CFR Part 72. In fact, these non-fuel components are included in the definition of spent fuel in 10 CFR 72.3, which states that spent fuel "…includes special nuclear material, byproduct material, source material, and other radioactive material associated with fuel assemblies." We note that the Nuclear Waste Policy Act of 1982, as amended, grants NRC explicit

authority to define "spent fuel" in this manner.[1] We also note that non-fuel components are included in the definition of spent nuclear fuel in 10 CFR Part 961, "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste" (Standard Contract). According to the Standard Contract, non-fuel components include, but are not limited to: control spiders, burnable poison rod assemblies, control rod elements, thimble plugs, fission chambers, primary and secondary neutron sources, BWR channels, etc. In effect, this definition assigns Federal responsibility for disposal of these materials even these materials were to be separated from the fuel for interim storage.

Explicit inclusion of these non-fuel components in the spent fuel storage definition is also supported by practical considerations. Non-fuel components are in close association with the fuel assembly in operation. These components remain with the fuel in pool storage or dry cask storage. These same non-fuel components will ultimately be disposed of in the Federal repository in accordance with the Nuclear Waste Policy Act as implemented in 10 CFR Part 961.

The second stated purpose of the proposed rule is to authorize the storage of additional materials at an ISFSI or MRS. This material includes reactor-related GTCC waste such as reactor internals, filters and resins. These reactor-related GTCC wastes are under Federal jurisdiction when they are generated and stored at the reactor under Part 50, and come under Federal jurisdiction when they are disposed of (Low-Level Waste Policy Amendments Act of 1985, Public Law 99-240). They should remain under Federal jurisdiction interim storage at an ISFSI or MRS. The industry fully supports this proposal.

In places, the proposed rule includes spent fuel associated material in the category of reactor related GTCC. We believe it is important for NRC to clarify that non-fuel components are in a separate category by virtue of the fact that these components are included in the definition of spent fuel. The rule should clearly state that a licensing basis is being proposed for storage of both categories of material, spent fuel associated material and reactor related GTCC in an ISFSI or MRS under Federal jurisdiction. Without this important clarification we believe the rule could be mis-interpreted to impose new requirements for licensees to demonstrate that non-fuel components also meet the radiological classification of GTCC waste as a condition of storage under Federal jurisdiction at an ISFSI or MRS. Such a requirement would be clearly counter to current practice, and is contrary to the intent of both NRC and DOE in including these materials in the definition of spent fuel for purposes of storage and disposal (Parts 72 and 961, respectively) under Federal jurisdiction. Further, a new requirement to classify these materials in any other manner could result in substantial unnecessary worker dose to perform the classification without any benefit to public health and safety or the environment.

Industry comments on the six specific questions posed in the proposed rule are provided on the attachment to this letter.

Once again, NEI appreciates the opportunity to provide these comments. If you have questions concerning the enclosed comments, please contact me at (202) 739-8109 or Paul Genoa at (202) 739-8034.

Sincerely,
Lynnette Hendricks

PHG/amj

Attachment

[1] Public Law 97-425, Section 2(12)(B)

Industry Responses to Questions

Posed in GTCC Proposed Rule

1. NRC should allow co-mingling of GTCC and spent fuel in the same storage cask when justified through a safety analysis. As discussed in the proposed rule, "Allowing commingling may be technically safe and economical use of spent fuel storage cask space."

2. The NRC should only permit the storage of explosive, pyrophoric, combustible, or chemically reactive GTCC waste in an ISFSI or MRS if it has been appropriately conditioned to eliminate the characteristic such that the GTCC material can now be safely stored. The adequacy of the waste conditioning should be demonstrated through a safety analysis.

3. The NRC should only permit the storage of GTCC waste that may generate or release gas in an ISFSI or MRS if it has been demonstrated that quantities of gas released will not exceed safe limits. The adequacy of safe limits should be demonstrated through a safety analysis.

4. The NRC should only permit the storage of solid GTCC waste that may contain free liquid in an ISFSI or MRS if the waste satisfies one of the following two conditions. First if the waste has been appropriately conditioned to eliminate the free liquid or, if it has been determined that the container has design features demonstrated to mitigate any safety impacts associated with free liquid. The adequacy of the conditioning and/or design should be demonstrated through a safety analysis.

5. The NRC should only permit the storage of liquid GTCC waste in an ISFSI or MRS if it has been determined that the container has design features demonstrated to mitigate any safety impacts associated with the liquid. The adequacy of the design should be demonstrated through a safety analysis.

6. NEI does not believe additional guidance in 10 CFR Parts 30 & 70 related to the storage of GTCC waste after license termination is needed. Experience with storage practices for the same storage under Part 50 is likely to be sufficient.

D
NRC GUIDANCE ON EXTENDED STORAGE OF LLW

On June 30, 1994, the Barnwell LLW disposal facility closed to waste generators in 28 states, in addition to three states that had already been denied access. An estimated several thousand licensees in the US were forced to store LLW until new disposal capacity became available. Although Barnwell subsequently reopened to all but one state, a continuing need exists for guidance for LLW storage, including the storage of greater than Class C (GTCC) waste.

When faced with interim LLW storage, licensees rely on NRC guidance in fulfilling their obligations for safe storage to ensure protection of the public health and safeth and the environment. In 1994, there were four primary NRC guidance documents:

Some of the information contained in the above guidance was outdated or no longer applicable. To correct this problem and to bring the applicable guidance into a single document, the NRC issued SECY-94-198, *Review of Existing Guidance Concerning the Extended Storage of Low-Level Radioactive Waste*. Attached to SECY-94-198 are revisions of the above four documents.

As we enter the new millennium, the guidance attachments to SECY-94-198 continue to be the current and most comprehensive guidance available from the NRC on LLW storage, including storage of GTCC waste. Accordingly, those attachments are included herein. The NRC plans to issue additional guidance specific to storage of GTCC waste concurrent with any final rulemaking for Part 72. If such guidance is indeed issued, it will also be included in the final version of this report.

E
NAC-MPC CONTAINER SYSTEM FOR SPENT FUEL AND GTCC WASTE STORED IN AN ISFSI

A canister designed and certified for transportation, storage and disposal is known as a "multi-purpose canisters (MPC)." This Appendix includes an illustration and the design specifications for one such MPC: the NAC Multi-Purpose Canister (NAC-MPC) system, which was procured by several commercial nuclear facilities being decommissioned.

Design specifications also are included for the associated NAC-MPC vertical dry storage casks. These specifications are included here to assist nuclear stations in planning for GTCC storage within an ISFSI by understanding the typical dimensions and construction materials used for a dry storage system.

NOTE: The appearance in this documentation of the NAC-MPC container system should NOT be construed as a recommendation for this specific system. The container system included herein is simply a typical example of a storage canister with readily available technical information and drawings submitted by a participating decommissioning plant.

For example, this report discusses the DOE GTCC waste canisters. One participating utility mentioned that they are using the more advanced NAC Universal Multi-Purpose Canister System (NAC-UMS) design for storage of GTCC waste and spent fuel with great success. The NAC-UMS canister is fundamentally different from the NAC-MPC system, but both are NRC-approved designs. At the time of publication of this report, the NRC had also approved canister and cask designs by General Nuclear Systems, Transnuclear, BNFL, Holtec, Pacific Sierra Nuclear Associates, and Westinghouse.

In an effort to be fair to as many canister manufacturers as reasonably possible, a listing of the available NRC-approved and certified canisters is included at the end of this Appendix. It is recommended that the user of this report refer to 10 CFR 72.214 for the most current listing of NRC-approved storage casks and canisters.

E.1 NAC-MPC Spent Fuel and GTCC Waste Storage Canister

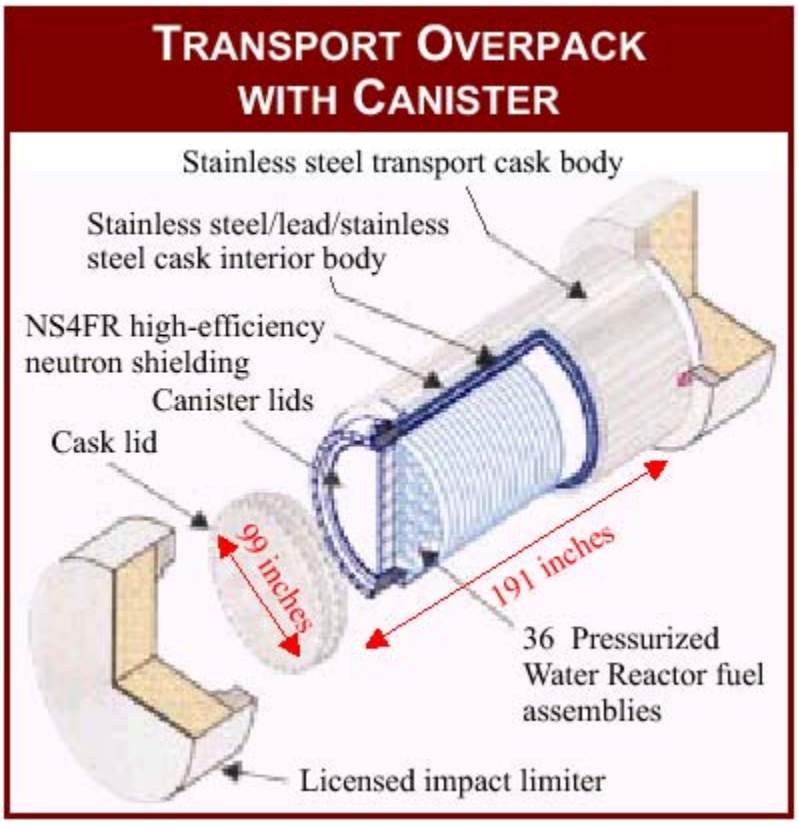

Figure E-1
Transportable NAC-MPC Storage Canister Showing the Spent Fuel Basket

Table E-1
Design Characteristics of the NAC-MPC System Canisters and Fuel Baskets

Design Characteristic	Dimensions *	Materials
Yankee -- MPC Canister		
-Shell	0.625 thick Plate	Type 304L Stainless Steel
-Bottom	1.0 thick Plate	Type 304L Stainless Steel
-Shield Lid	5.0 thick Plate	Type 304L Stainless Steel
-Structural Lid	3.0 thick Plate	Type 304L Stainless Steel
CY -- MPC Canister		
-Shell	0.625 thick Plate	Type 304L Stainless Steel
-Bottom	1.75 thick Plate	Type 304L Stainless Steel
-Shield Lid	5.0 thick Plate	Type 304L Stainless Steel
-Structural Lid	3.0 thick Plate	Type 304L Stainless Steel
Yankee -- MPC Fuel Basket		
-End Weldments	0.5 x 68.98 dia	Type 304L Stainless Steel
-Support Disks	0.5 x 69.15 dia	Type 17-4 PH Stainless Steel
-Heat Transfer Disks	0.5 x 68.70 dia	Type 6061-T651 Aluminum Alloy
-Fuel Tube	7.80 x 7.80 x 0.048	Type 304L Stainless Steel encasing BORAL
-Spacers	2.5 dia	Type 304L Stainless Steel
-Tie Rods (8)	1.125 dia	Type 304L Stainless Steel
CY -- MPC Fuel Basket		
-End Weldments	0.5 x 68.98 dia	Type 304L Stainless Steel
-Support Disks	0.5 x 69.15 dia	Type 17-4 PH Stainless Steel
-Heat Transfer Disks	0.5 x 68.70 dia	Type 6061-T651 Aluminum Alloy
-Fuel Tube	8.72 x 8.72 x 0.048	Type 304L Stainless Steel encasing BORAL
-Oversize Fuel Tube	9.12 x 9.12 x 0.048	Type 304L Stainless Steel encasing BORAL
-Spacers	2.5 dia	Type 304L Stainless Steel
-Tie Rods (8)	1.125 dia	Type 304L Stainless Steel

* All dimensions are in inches.

Table E-2
Design Characteristics of the NAC-MPC System Vertical Dry Storage Casks

Design Characteristic	Dimensions *	Materials
Yankee--MPC Concrete Cask		
Weldment Structure		
-Shell	3.5 thick x 86.0 dia	ASTM A36 Carbon Steel
-Top Flange	2.0 thick x 97.9 dia	ASTM A36 Carbon Steel
-Support ring	2.5 thick x 79.0 dia	ASTM A36 Carbon Steel
-Base Plate	2.0 thick x 72.0 dia	ASTM A36 Carbon Steel
Concrete Cask		
-Concrete Shell	21.0 thick x 128.0 dia	Type II Portland Cement
-Shield Plug	5.13 x 78.5 dia	ASTM A36 Carbon Steel and NS-4-FR
-Lid	1.5 thick x 92.1 dia	ASTM A36 Carbon Steel
-Rebar	Various	ASTM 615, GR 60, Carbon Steel
CY--MPC Concrete Cask		
Weldment Structure		
-Shell	3.5 thick x 86.0 dia	ASTM A36 Carbon Steel
-Top Flange	2.0 thick x 97.9 dia	ASTM A36 Carbon Steel
-Support ring	2.5 thick x 79.0 dia	ASTM A36 Carbon Steel
-Base Plate	2.0 thick x 72.0 dia	ASTM A36 Carbon Steel
-Baffle	17.0 x 30.0 dia	ASTM A36 Carbon Steel
Concrete Cask		
-Concrete Shell	21.0 thick x 128.0 dia	Type II Portland Cement
-Shield Plug	3.75 x 78.5 dia	ASTM A36 Carbon Steel and NS-4-FR or NS-3
-Lid	2.88 thick x 92.1 dia	ASTM A36 Carbon Steel
-Rebar	Various	ASTM 615, GR 60, Carbon Steel

* All dimensions are in inches.

E.2 NRC Approved Spent Fuel Storage Casks (from 10 CFR 72.214)

Table E-3 was extracted from the DOE report *Civilian Radioactive Waste Management System.* It is intended to demonstrate the wide range of dry spent fuel storage options available to the nuclear industry and without giving preference to any individual system or manufacturer.

Table E-3
Dry Storage Technologies Being Used or Available for Use at Independent Spent Fuel Storage Installations as of October 1998

Technology	Description	Vendor	Capacity
CASTOR V/21	Metal Storage Cask	General Nuclear Systems, Inc	21 PWR
CASTOR X/33	Metal Storage Cask	General Nuclear Systems, Inc	33 PWR
CASTOR X/74	Metal Storage Cask	General Nuclear Systems, Inc	74 BWR
MC-10	Metal Storage Cask	Westinghouse	49 BWR/24 PWR
MVDS	Modular Vault Dry Storage	Foster Wheeler Environmental	Varies
NAC-128 S/T	Metal Storage/ Transport Cask	NAC International	28 PWR
TN-32	Metal Storage Cask	Transnuclear, Inc	32 PWR
TN-40	Metal Storage Cask	Transnuclear, Inc	40 PWR
NUHOMS-7P	Concrete Storage Module	Transnuclear, Inc	7 PWR
NUHOMS-24P	Concrete Storage Module	Transnuclear, Inc	24 PWR
NUHOMS-52B	Concrete Storage Module	Transnuclear, Inc	52 BWR
VSC-24	Concrete Storage Cask	Sierra Nuclear Corporation	61 BWR/24 PWR

It should be noted that Table E-3 includes dry storage modules and casks, as well as transportation casks. The available, approved and certified canister systems represents a dynamic listing. The interested utility should refer to the NRC's listing of approved and certified casks and canisters, which documents the Certificate of Compliance number, model number, and intended purpose (e.g., MPC, dry storage, transportation, disposal). The following casks/canisters are approved for storage of spent fuel under the conditions specified in their Certificates of Compliance.

Certificate Number: 1000.

- SAR Submitted by: General Nuclear Systems, Inc.
- SAR Title: Topical Safety Analysis Report for the Castor V/21 Cask Independent Spent Fuel Storage Installation (Dry Storage)
- Docket Number: 72 - 1000

- Certification Expiration Date: August 17, 2010
- Model Number: CASTOR V/21

Certificate Number: 1001.

- SAR Submitted by: Westinghouse Electric Corporation
- SAR Title: Topical Safety Analysis Report for the Westinghouse MC - 10 Cask for an Independent Spent Fuel Storage Installation (Dry
- Storage)
- Docket Number: 72 - 1001
- Certification Expiration Date: August 17, 2010
- Model Number: MC - 10

Certificate Number: 1002.

- SAR Submitted by: Nuclear Assurance Corporation
- SAR Title: Topical Safety Analysis Report for the NAC Storage/Transport Cask for Use at an Independent Spent Fuel Storage
- Installation
- Docket Number: 72 - 1002
- Certification Expiration Date: August 17, 2010
- Model Number: NAC S/T

Certificate Number: 1003.

- SAR Submitted by: Nuclear Assurance Corporation
- SAR Title: Topical Safety Analysis Report for the NAC Storage/Transport Cask Containing Consolidated Fuel for Use at an Independent
- Spent Fuel Storage Installation
- Docket Number: 72 - 1003

- Certification Expiration Date: August 17, 2010
- Model Number: NAC - C28 S/T

Certificate Number: 1004.

- Initial Certificate Effective Date: January 23, 1995.
- Amendment No. 1 Effective Date: April 27, 2000.
- Amendment No. 2 Effective Date: September 5, 2000.
- SAR Submitted by: Transnuclear West, Inc.
- SAR Title: Transnuclear West, Inc., ``Final Safety Analysis Report for the Standardized NUHOMS® Horizontal Modular Storage
- System for Irradiated Nuclear Fuel".
- Docket Number: 72-1004.
- Certificate Expiration Date: January 23, 2015.
- Model Number: Standardized NUHOMS®-24P and NUHOMS®-52B.

Certificate Number: 1005.

- SAR Submitted by: Transnuclear, Inc.
- SAR Title: TN - 24 Dry Storage Cask Topical Report.
- Docket Number: 72 - 1005.
- Certification Expiration Date: November 4, 2013.
- Model Number: TN - 24.

Certificate Number: 1007.

- Initial Certificate Effective Date: May 7, 1993.
- Amendment Number 1 Effective Date: May 30, 2000.
- Amendment Number 2 Effective Date: September 5, 2000.

- Amendment Number 3 Effective Date: May 21, 2001.
- SAR Submitted by: Pacific Sierra Nuclear Associates.
- SAR Title: Final Safety Analysis Report for the Ventilated Storage Cask System.
- Docket Number: 72-1007.
- Certificate Expiration Date: May 7, 2013.
- Model Number: VSC-24.

Certificate Number: 1008.

- Initial Certificate Effective Date: October 4, 1999.
- Amendment Number 1 Effective Date: December 26, 2000.
- SAR Submitted by: Holtec International.
- SAR Title: Final Safety Analysis Report for the HI-STAR 100 Cask System.
- Docket Number: 72-1008.
- Certificate Expiration Date: October 4, 2019.
- Model Number: HI-STAR 100.

Certificate Number: 1014.

- SAR Submitted by: Holtec International.
- SAR Title: Final Safety Analysis Report for the HI-STORM 100 Cask System.
- Docket Number: 72-1014.
- Certificate Expiration Date: June 1, 2020.
- Model Number: HI-STORM 100.

Certificate Number: 1015.

- Initial Certificate Effective Date: November 20, 2000.
- Amendment No. 1 Effective Date: February 20, 2001.

- SAR Submitted by: NAC International, Inc.
- SAR Title: Final Safety Analysis Report for the NAC-UMS Universal Storage System.
- Docket Number: 72-1015.
- Certificate Expiration Date: November 20, 2020.
- Model Number: NAC-UMS.

Certificate Number: 1021

- Initial Certificate Effective Date: April 19, 2000
- Amendment Number 1 Effective Date: February 20, 2001
- SAR Submitted by: Transnuclear, Inc.
- SAR Title: Final Safety Analysis Report for the TN-32 Dry Storage Cask
- Docket Number: 72-1021
- Certificate Expiration Date: April 19, 2020
- Model Number: TN-32, TN-32A, TN-32B

Certificate Number: 1025.

- SAR Submitted by: NAC International.
- SAR Title: Final Safety Analysis Report for the NAC Multi-Purpose Canister System (NAC-MPC System).
- Docket Number: 72-1025
- Certificate Expiration Date: April 10, 2020.
- Model Number: NAC-MPC.

Certificate Number: 1026.

- Initial Certificate Effective Date: February 15, 2001
- Amendment Number 1 Effective Date: May 14, 2001

- SAR Submitted by: BFNL Fuel Solutions.
- SAR Title: Final Safety Analysis Report for the FuelSolutionsTM Spent Fuel Management System.
- Docket Number: 72-1026
- Certificate Expiration Date: February 15, 2021.
- Model Number: WSNF-200, WSNF-201, and WSNF-203 systems; W-150 storage cask; W-100 transfer cask; and the W-21 and W-74 canisters

Certificate Number: 1027.

- SAR Submitted by: Transnuclear, Inc.
- SAR Title: Final Safety Analysis Report for the TN-68 Dry Storage Cask.
- Docket Number: 72-1027.
- Certificate Expiration Date: May 28, 2020.
- Model Number: TN-68.

F
NRC GUIDANCE ON STORAGE OF GTCC WASTE IN AN ISFSI

The following letter was sent to Dr. Andrew Kadak, President, American Nuclear Society, from E. William Brach, Director, Spent Fuel Project Office, NRC Office of Nuclear Material Safety and Safeguards. It is included as an attachment to this report because it provides specific guidance on storage of GTCC waste at an ISFSI at a time when the availability of such guidance is very limited. In the absence of a clean original copy of this letter, the letter has been retyped here in its entirety.

United States
Nuclear Regulatory Commission
Washington, D.C. 20555-0001

September 27, 1999

Dr. Andrew Kadak, President
Kadak Associates and President-Elect
American Nuclear Society
253 Rumstick Point Road
Barrington, RI 02806

Dear Dr. Kadak:

In our discussions at the June 1999 American Nuclear Society Executive Conference in Traverse City, MI, you raised a question regarding the authority to store Greater Than Class C (GTCC) waste under Title 10, Code of Federal Regulations (10 CFR), Parts 50 and 72. The term “GTCC” refers to waste that exceeds the concentration limits of radionuclides established for Class C waste in 10 CFR 61.55, and would not be generally acceptable for near-surface disposal as low-level waste. The purpose of this letter is to clarify the Nuclear Regulatory Commission (NRC) position on the authority to store GTCC waste under the provisions of 10 CFR Parts 50 and 72.

General License Authority under 10 CFR Parts 50 and 72:

The authority to license the possession and storage of material, which when disposed of would be classified as GTCC waste, is contained within 10 CFR Part 30 for byproduct material and

10 CFR Part 70 for special nuclear material. A 10 CFR part 30 or 70 general license is normally conferred as part of the 10 CFR Part 50 license. Therefore, a reactor licensee is permitted to store GTCC waste generated on its reactor site, within the exclusion area, under the authority of its 10 CFR Part 50 license.

GTCC waste can be stored at a reactor site, including the cask storage pad(s) of an independent spent fuel storage installation (ISFSI), under a 10 CFR Part 50 license. The GTCC waste must be stored in containers separate from the spent fuel storage casks and stored in a manner that meets the 10 CFR Part 20 regulations. The storage of GTCC waste must pose no safety problems for licensed activities under 10 CFR Parts 50 or 72.

Site-specific License Authority under 10 CFR Part 72:

The regulations in 10 CFR Part 72 do not authorize the possession or storage of GTCC waste under a site-specific 10 CFR Part 72 license. The staff is preparing, at Commission direction, a proposed rule to modify 10 CFR Part 72 to allow storage of GTCC waste at an ISFSI under the authority of a site-specific 10 CFR Part 72 license.

I trust this responds to your question and clarifies the NRC position on the storage of GTCC waste at an independent spent fuel storate installation. If you have any further questions about this matter, I may be reached at (301) 415-8500.

Sincerely,

ORIGINAL SIGNED BY /s/

E. William Brach, Director
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

G
NRC GUIDANCE ON STORAGE OF FUEL ASSEMBLY INTEGRAL COMPONENTS IN AN ISFSI

Spent Fuel Project Office
NRC Office of Nuclear Material Safety and Safeguards

Interim Staff Guidance - 9

Issue: Storage of Pressurized Water Reactor (PWR) Fuel Assembly Integral Components

Discussion:

The Standard Review Plan does not provide explicit guidance on the storage of rod cluster control assemblies, burnable poison (rod) assemblies, thimble plugging assemblies, and primary and secondary source assemblies as materials associated with the storage of spent fuel assemblies. While control rods are mentioned in the Standard Review Plan as possible contents, specific information and guidance is lacking.

Regulatory Basis:

Title 10, Code of Federal Regulations (10 CFR), Section 72.3, "Definitions," states, "Spent Nuclear Fuel or Spent Fuel means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least one year's decay since being used as a source of energy in a power reactor, and has not been chemically separated into its constituent elements by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies."

Technical Review Guidance:

Standard Review Plan for Dry Cask Storage Systems, NUREG-1536, Chapter 2, "Principal Design Criteria," Section IV.2.a, states, "The applicant should define the range and types of spent fuel or other radioactive materials that the DCSS [dry cask storage system] is designed to store . . . For DCSSs that will be used to store radioactive materials other than spent fuel, that is, activated components associated with a spent fuel assembly (e.g., control rods, BWR fuel channels), the applicant should specify the types and amounts of radionuclides, heat generation, and the relevant source strengths and radiation energy spectra permitted for storage in the DCSS" [page 2-4].

Recommendation:

Rod cluster control assemblies are materials that may be associated with the storage of spent fuel. When used, burnable poison (rod) assemblies, thimble plugging assemblies, and neutron source assemblies, are integral components of a PWR fuel assembly and are also associated with the storage of spent fuel. These components may be approved for storage in a DCSS if the applicant submits information and the safety/technical justification for the proposed DCSS contents for staff review and approval. The staff should incorporate this information as proposed contents in the license, certificate of compliance, or technical specification.(1)

Specifically, the technical review staff should consider the following in its review:

- The design bases source term (radiological and thermal) should be based on a saturation value for activation of cobalt impurities or on cobalt activation from a specified maximum burn-up and minimum cool time. The reviewer should consider other activation products, as appropriate.

- The effects of gas generation must be considered in the design pressure for the cask, including (1) the release of gas from additional components and (2) the volume occupied by additional components on the cask internal pressure.

- Additional weight and length of the proposed material must be considered in the structural and stability analyses.

- The thermal analysis must consider (1) the added heat from these components and (2) the effects of heat transfer within and to/from the fuel assembly by the addition or absence of these components. This would ultimately affect the maximum predicted cladding temperature.

- In terms of a criticality evaluation, absent direct physical measurements, no credit should be assumed for any negative reactivity from residual neutron absorbing material remaining in the control components. A bounding analysis would assume that no control components are present. Credit for water displacement may be taken provided adequate structural integrity and placement under accident conditions is demonstrated. Also, the reviewer may need to consider the effects of displacing borated water, if applicable.

To the degree that comparable reactor technologies have similar attributes (burnable poisons, bypass flow restricting devices, and sources), the reviewer should similarly accept that the material may be stored in a DCSS as noted above.

The Standard Review Plans (NUREG-1536 at citation noted above, and NUREG-1567, at Section 4.4.1.1) should be revised to clearly state those rod cluster control assemblies, burnable poison (rod) assemblies, thimble plugging assemblies and primary and secondary source assemblies may be stored in a DCSS, evaluated appropriately, and the proposed contents included in the license, certificate of compliance, or technical specification.

Approved

E. William Brach
Date (posted on web site June 18. 1999)

1. It should be noted that if a license, certificate of compliance, or technical specification has already been issued and does not specifically allow storage of these components, there is no other regulatory relief to allow new contents other than an amendment. Therefore, the applicant should seek to amend its license, certificate of compliance, or technical specification.

Note to reader of this EPRI report: Please read the easily overlooked comment which appears after the signature line, as it bears directly on the storage of certain GTCC components.

H
EXTENDED STORAGE OF SEALED SOURCES

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

July 8, 1993

NRC INFORMATION NOTICE 93-50: EXTENDED STORAGE OF SEALED SOURCES

Addressees

All licensees authorized to possess sealed sources.

Purpose

The U.S. Nuclear Regulatory Commission is issuing this information notice to inform addressees of what information NRC considers necessary for placing a license into a possession-only status, if extended storage of sealed sources is necessary. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to provide all necessary information when requesting possession-only licenses. However, suggestions contained in this information notice are not new NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

A number of licensees who possess sealed sources have gone out of business or allowed their licenses to expire for various reasons. These licensees are finding it difficult, and sometimes impossible, to dispose of their radioactive sources. There have been several incidents where licensees having financial difficulty have abandoned their sources in violation of NRC regulations.

Disposal is especially difficult for greater-than-Class-C (GTCC) sealed sources. The requirements for classifying waste for near-surface disposal are provided in 10 CFR 61.55. This regulation states that GTCC waste is generally not acceptable for near-surface disposal and must be disposed of in a geologic repository, pursuant to Part 60, unless another disposal method is approved by NRC. Many sealed source users have discovered that they have no place to ship their GTCC sources for disposal, because no geologic repository is currently available.

The Low-Level Radioactive Waste Policy Amendments Act of 1985 designates the Federal Government as responsible for disposal of GTCC wastes. Congress has designated the Department of Energy (DOE) as the responsible agency for disposal of GTCC waste. NRC has been working with DOE to establish an interim storage facility for GTCC waste, until a geologic repository is available. DOE estimates that a storage facility may be available by the end of 1997. However, further delays in meeting this schedule may occur.

Discussion

If a licensee with sealed sources wishes to terminate its license, but cannot find any way to dispose of its sources, the licensee can request an amendment to restrict its license to possession-only, incident to license termination. Under current annual fee regulations, this will exempt the licensee from the requirement to pay an annual fee under 10 CFR Part 171 for the fiscal year following issuance of the license amendment authorizing possession only, and each year thereafter. (Each fiscal year begins on October 1.) The licensee will continue to be subject to licensing and inspection fees under 10 CFR Part 170. The inspection frequency for possession-only licenses is once every 3 years under current NRC inspection procedures.

Extended Storage of Sealed Sources

The annual fee waiver is intended for licensees who have permanently ceased licensed operations. The annual fee will not be waived for licensees who wish to put their licenses, certificates, approvals, or registrations in an inactive status, on a temporary basis, with the intent of reactivating them as needed. The following information is needed to process requests for possession-only licenses:

1. Identification of each sealed source to be placed in storage, including the manufacturer's name, model number, serial number, isotope, and activity.

2. A detailed description of efforts made to dispose of the sources, including telephone calls, letters, facsimiles, personal contacts, etc.

3. A statement that the licensee has permanently ceased licensed operations and a commitment not to use the sources for any purpose pending disposition and license termination.

4. A physical description of the facilities where the sealed sources will be stored, if it is different from storage facilities already approved in the license. Identify any facility changes that are planned after the sources are placed in storage and provisions to maintain exposure to radiation as low as reasonably achievable (ALARA).

5. Identification of the individual who will be responsible for maintaining control of the stored sources. Provide a resume of training and experience, if this information has not already been provided.

6. A description of the accountability program to be implemented by the licensee to ensure that its sources remain in secure storage and are not used. The program should provide reasonable assurance that the licensee can maintain security and account for the sources (inventory at least annually).

7. A description of planned changes to the licensee's radiation safety program as a result of placing the sources in storage. These changes may include, but are not limited to, the following:

a. dosimetry services b. worker training programs c. instrument calibration services d. quarterly inventories e. internal audits f. maintenance and visual inspection of equipment and storage facilities g. maintenance of utilization logs

8. A commitment to leak-test the sources at least once every 3 years and immediately before transfer to an authorized recipient.

9. A commitment to maintain the license in an active state. (Note that amendment, renewal, and inspection fees will continue to apply.)

When a storage/disposal facility becomes available, it is expected that licensees with possession-only licenses will transfer their sealed sources and request license termination.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the contacts listed below or the appropriate regional office.

/s/'d by Carl J. Paperiello

Richard E. Cunningham, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical contacts:	Jack Whitten, RIV	(817) 860-8197
	Kevin Ramsey, NMSS	(301) 504-2534
Fee contact:	Doug Weiss, OC	(301) 492-7225

Target:
Nuclear Power

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EPRI • 3412 Hillview Avenue, Palo Alto, California 94304 • PO Box 10412, Palo Alto, California 94303 • USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com