

Regulatory Analysis for Rulemaking on  
Interim Storage for Greater than Class C Waste

1. STATEMENT OF THE PROBLEM AND OBJECTIVES

BACKGROUND

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<sup>1</sup>. 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 must be disposed of in a geologic repository unless approved for an alternative disposal method on a case-specific basis by the NRC.

The petitioner is an NRC-licensed utility responsible for the Trojan Nuclear Plant (Trojan). In the petition, the petitioner anticipated that during decommissioning of Trojan it would need to dispose of GTCC waste. The Trojan 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 GTCC waste also be stored at the ISFSI pending its 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

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<sup>1</sup> In 10 CFR Part 61.55, "Waste Classification," the NRC defines 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.

Part 72 should be amended to explicitly provide for the isolation and storage of GTCC waste in a licensed ISFSI.

The petitioner believes that storage of GTCC waste under 10 CFR Part 72 will ensure safe interim storage. This storage would provide identical public health and safety and environmental protection as required for spent fuel located at an ISFSI. For example, Subpart F of 10 CFR Part 72 (General Design Criteria) establishes design, fabrication, construction, testing, quality standards, maintenance, and performance requirements for structures, systems, and components important to safety.

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 similar manner to spent nuclear fuel. The revised definitions would only apply to the interim storage of GTCC waste under the authority of 10 CFR Part 72.

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. The Nuclear Energy Institute 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.

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 criteria in this part. As discussed in this draft rulemaking plan, licensees

are authorized to store GTCC waste pursuant to the regulations in 10 CFR Part 30 and/or Part 70. Therefore, the draft rulemaking plan discussed an additional option to store GTCC waste under 10 CFR Part 72 while maintaining the 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 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 requested Agreement State input relative to their likelihood of relinquishing authority for licensing when an ISFSI or a Monitored Retrievable Storage Installation (MRS) is involved in storing GTCC waste. Three of the four state commenters indicated that they would not voluntarily relinquish their authority.

## 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 pursuant 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 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. 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 §§ 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 policies will be helpful in developing 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 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 and to preclude storage of liquid GTCC waste.

Therefore, as discussed in the Federal Register notice, NRC is specifically requesting additional input from the public and DOE to develop a more effective rulemaking with respect to commingling of GTCC waste and spent fuel (in an ISFSI) or spent fuel, high-level waste, and GTCC waste (in an MRS).

## 2. IDENTIFICATION AND ANALYSIS OF ALTERNATIVE APPROACHES

There are three alternatives the NRC considered to resolve the petition from the Portland General Electric Company. All three are protective of public health and safety, but differ in implementation and resources. For the reasons discussed, the NRC is proposing to implement alternative three.

ALTERNATIVE 1: Deny the petition. The first option is to clarify that NRC's existing regulations allow storage of GTCC waste co-located at the licensee's ISFSI under a 10 CFR Part 30 or Part 70 license conferred as part of their 10 CFR Part 50 license. However, upon termination of the 10 CFR Part 50 license it would be necessary to apply for a specific 10 CFR Part 30 or Part 70 license (or under equivalent Agreement State 10 CFR Part 30 or Part 70 regulations) if GTCC waste is to remain at the ISFSI. Under this option, the petition would be denied because no changes to NRC's regulations are necessary to meet the specific requirements of the petitioner. The NRC could issue an Information Notice or issue a clarifying rule change to 10 CFR Part 72 that makes it clear that GTCC waste can be stored at an ISFSI under a 10 CFR Part 50 license during reactor operations, or under a 10 CFR Part 30 or Part 70 license either during operations or after the Part 50 license is terminated.

However, the applicable regulations do not provide any explicit criteria for this unique waste type. Therefore, the licensee, in their license application, would need to propose site-specific criteria and the NRC would need to review each license application on a case-by-case basis or the NRC could develop generic criteria.

This alternative is the least resource intensive in the short term (i.e., no rulemaking would be undertaken), but the NRC believes there are several disadvantages. First, since each licensee would propose site-specific criteria, the licensing process could be more complicated for the licensee (need to develop appropriate criteria) and for the NRC to review and approve this criteria on a case-by-case basis. This could also result in numerous regulatory proposals throughout the country. Second, these site-specific criteria could be raised as issues during potential hearings on the 10 CFR Part 72 license. And third, after termination of the 10 CFR Part 50 license, licensees would need multiple licenses to store GTCC waste in the same location as spent fuel.

Although this alternative saves resources in the short term, the NRC believes that denying the petition would impose an unnecessary regulatory burden on reactor licensees and would require more NRC resources in the long-term than developing a rulemaking as discussed in alternatives two and three.

ALTERNATIVE 2: Change the regulations in 10 CFR Parts 72 and 171 to allow interim storage of NRC-licensed reactor-related GTCC waste within an ISFSI or MRS licensed by the NRC, or the appropriate Agreement State, using criteria in 10 CFR Part 72. The alternative 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. Storage and licensing requirements would be fully contained in 10 CFR Part 72. Interim storage of GTCC waste would be permitted under a 10 CFR Part 72 specific license. This alternative would meet the request of the petitioner. Under this alternative, the NRC would change the compatibility level of 10 CFR Part 72 to allow Agreement States to license reactor-related GTCC waste in a manner similar to the NRC. In a non-Agreement State only one license would be needed for storage of spent fuel and GTCC waste under 10 CFR Part 72. Within an Agreement State, after termination of the 10 CFR Part 50 license, the licensee would need a license from the NRC for spent fuel and a license from the Agreement State for GTCC waste. However, having two agencies responsible for licensing and inspecting the same facility is not the most efficient use of resources. This disadvantage is further elaborated on in the discussion of alternative three which reserves all reactor-related GTCC waste licensing to the NRC.

The NRC believes that this alternative does provide a more efficient means (relative to alternative one) of implementing storage of GTCC waste co-located at an ISFSI or an MRS than what is currently permitted by the regulations. That is, revising the regulations to allow storage of GTCC waste under 10 CFR Part 72 does not preclude storing it under 10 CFR Part 30 or Part 70. 10 CFR Part 72 was developed specifically for an ISFSI and an MRS. The licensing process will be clearer and more straightforward by having all related licensing under one part. Criteria in 10 CFR Part 72 would be used for the GTCC waste. Although the GTCC waste would meet requirements in 10 CFR Part 72, the individual waste types are different than spent fuel. The GTCC waste is in a solid form (i.e., mostly activated metals) such as reactor

internals, nozzles, and in-core instrumentation. Specific criteria will be added to 10 CFR Part 72 to preclude storage of liquid GTCC waste within an ISFSI or an MRS. If necessary, liquid GTCC waste could be stored under a 10 CFR Part 30 and/or 70 license with appropriate conditions.

ALTERNATIVE 3: Change the regulations in 10 CFR Parts 72, 150, and 171 to allow interim storage of NRC-licensed reactor-related GTCC waste within an ISFSI or MRS licensed only by the NRC. This alternative is the same as alternative two except that licensing the storage of reactor-related GTCC waste would be reserved to the NRC. Therefore, an additional change is being proposed for 10 CFR Part 150. Licensing would be reserved to the NRC regardless of whether the GTCC waste was licensed under 10 CFR Part 30, 70, or 72.

Because 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 will likely end up in a geologic repository with spent fuel. 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 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. This alternative will allow the licensee to obtain only one 10 CFR Part 72 license for storage of spent fuel and GTCC waste.

### 3. ESTIMATE AND EVALUATION OF VALUES AND IMPACTS

The NRC has not quantitatively evaluated the cost savings of alternative three. Alternative three has the advantages of providing the most consistent licensing while also being the least costly option in the long term. The NRC estimates that about one staff year will be needed to develop this rulemaking. There are currently 31 ISFSIs either operating or under development. The NRC spends an estimated 20 staff years evaluating specific licenses and

amendments under 10 CFR Part 72. The incremental resources to include the review of GTCC waste within a license application or amendment is estimated to be 120 hours (0.06 staff years). To review a separate 10 CFR Part 30 or Part 70 license, with unknown criteria, could take significantly longer. If a significant number of ISFSIs apply for a 10 CFR Part 72 license to store GTCC waste, the savings to NRC would easily out way the resources to complete this rulemaking. The savings to licensees is not estimated, but given that the six commenters all supported this petition, the NRC believes that the benefit to licensees is also significant.

#### 4. DECISION RATIONALE

The NRC is proposing to amend 10 CFR Parts 72, 150, and 171. The NRC believes that the proposed rule would have the following benefits: (1) allowing licensees the option of storing GTCC waste under 10 CFR Part 72, while not precluding licensees from developing their own criteria as allowed under existing regulations; (2) providing that for reactor-related GTCC waste the licensing will be with the Federal government from generation through disposal; (3) allowing reactor licensees to have only one 10 CFR Part 72 license for both their spent fuel and GTCC waste; and (4) minimizing the use of total NRC, Agreement State, and licensee resources by having only one agency license and inspect ISFSIs.

In summary, the NRC believes that the proposed rule change would allow a more cost effective means of storing this waste with no significant impact to public health and safety.

#### 5. IMPLEMENTATION

Unless significant concerns are raised during the public comment period, a final rule should be completed during FY2000.