

## POLICY ISSUE INFORMATION

April 26, 2001

SECY-01-0076

FOR: The Commissioners

FROM: William D. Travers  
Executive Director for Operations

SUBJECT: RETRIEVABILITY OF SPENT FUEL FROM DRY STORAGE CASKS

### PURPOSE:

To inform the Commission of current staff practices and position on spent nuclear fuel retrievability for spent fuel storage, under 10 CFR Part 72, with attention to the fact that the U.S. Department of Energy (DOE) will be undertaking disposal of the spent nuclear fuel.

### BACKGROUND:

Section 141(b)(1)(C) of the Nuclear Waste Policy Act of 1982, as amended (NWPAA), requires that “[e]ach [monitored retrievable storage facility] shall be designed - (C) to provide for the ready retrieval of such spent fuel and waste for further processing or disposal.” In consideration of this NWPAA requirement, the Commission amended Part 72 in 1989 to include § 72.122(l): “*Retrievability*. Storage systems must be designed to allow ready retrieval of spent fuel or high-level radioactive waste for further processing or disposal.” 53 FR 31651. The Commission explained in its proposed rule: “Not only must the MRS be designed for removal of the spent fuel or high-level radioactive waste, but an ISFSI must meet the same criteria for the stored spent fuel. The spent fuel at an ISFSI must also be retrievable for transport to either the MRS or HLW repository whenever they become available.” 51 FR 19108 (1986). In 1990, the Commission further amended Part 72 to add § 72.236(m): “To the extent practicable in the design of storage casks, consideration should be given to compatibility with removal of the stored spent fuel from a reactor site, transportation, and ultimate disposition by the Department of Energy.” 55 FR 29181.

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The U.S. Nuclear Regulatory Commission (NRC) staff has developed technical review guidance related to spent fuel retrievability and the treatment of damaged fuel, for use in licensing Interim Spent Fuel Storage Installations and certifying spent nuclear fuel storage cask designs. In accordance with current staff guidance in Interim Staff Guidance -1, "Damaged Fuel," any assembly that contains fuel rods with cladding defects greater than pinhole leaks or hairline cracks is considered to be a damaged fuel assembly. Damaged spent fuel assemblies are to be canned, and thus are individually retrievable from the storage canister in which they are placed. An individual can contains any gross fuel particles such that the canned assembly remains retrievable. Several cans may then be placed inside a storage canister, along with intact (uncanned) assemblies.

Staff practice has been to consider damaged fuel assemblies retrievable if they are placed into individual cans. The staff believes this practice is consistent with the retrievability requirements of 10 CFR 72.122(l) and 72.236(m).

DOE's plans for final disposal at the high-level waste repository may involve repackaging of the spent fuel, upon receipt at the national repository, into a specially designed disposal canister ("Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada," DOE/EIS-0250D, July 1999).

#### DISCUSSION:

The staff would like to inform the Commission that it has received two licensing requests to authorize storage of damaged fuel assemblies in dry storage casks, without the licensee first placing the damaged assemblies in individually retrievable cans. One request, currently under staff review, asked the staff to consider allowing storage of uncanned damaged assemblies if the applicant could demonstrate that each assembly would maintain its structural integrity under normal and off-normal accident conditions. Further, the applicant stated that even if the assemblies did not maintain their structural integrity, the cask design and analyses would demonstrate that the cask maintains its safety under thermal, shielding, and criticality considerations.

The second request asked the staff to consider allowing storage of uncanned damaged assemblies, but stated that screens would be placed on both ends of the basket fuel cell so that any gross particles would be contained in the individual basket cells. Individual basket cells cannot be removed from a canister, unlike individual cans. The applicant planned to demonstrate that if the assemblies did not maintain their structural integrity, the cask design would maintain its safety under thermal, shielding, and criticality considerations. The applicant for this second request has withdrawn this design consideration, but the staff needs to develop a position on retrievability regarding an uncanned assembly or canister.

Staff has determined, as a modification to the current practice, that a damaged fuel assembly may be considered retrievable from a canister if it can be demonstrated to remain structurally intact during the storage period and during off-normal events. An assembly is structurally intact if it can be handled (and thus retrieved) by normal means.

DOE spent fuel management operations are discussed in the Draft Environmental Impact Statement (DEIS) for the geologic repository at Yucca Mountain. The DEIS assumes that spent nuclear fuel arriving in shipping casks or dual-purpose casks would be opened and repackaged at the repository, with each individual assembly being handled. According to the DOE DEIS, the assemblies would be placed in a smaller disposal canister with more

restrictive heat load limits than the dual-purpose casks certified by NRC. Most currently approved spent fuel storage and transportation designs contain significantly more assemblies and are certified to much larger heat loads. This trend in storage and transportation cask designs is not anticipated to change to the smaller design DOE considered in the DEIS.

The current staff treatment of spent fuel retrievability will continue to ensure, under normal and off-normal storage conditions, that handling of individual assemblies or canned assemblies can be accomplished safely through normal means.

Staff is initiating interagency discussions on spent nuclear fuel retrievability to determine if an alternative option is viable, and to understand the potential ramifications, if any, on DOE's schedule for acceptance of reactor licensee spent fuel that may be damaged or only confined within the canister. Until there are such discussions, staff will maintain the position that retrievability requires that each individual assembly or canned assembly be retrievable, from the canister, using normal means of handling. If, through communications with DOE, it appears that another definition of retrievability is a viable option, then staff will notify the Commission of any recommended courses of action.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

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