



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**

WASHINGTON, D.C. 20555-0001

April 16, 1997

MEMORANDUM TO: Cynthia D. Pederson, Director  
 Division of Nuclear Materials Safety  
 Region III

FROM: Jack W. Roe, *Jack W. Roe*  
 Director  
 Division of Reactor Projects III/IV  
 Office of Nuclear Reactor Regulation

SUBJECT: TASK INTERFACE AGREEMENT 96-0440; DEFINING DRY CASK STORAGE  
 TERMS (TAC NOS. M97346 AND M97347)

In response to your request dated November 26, 1996, NRR/DRPW and NMSS/SFPO have discussed the questions raised and offer the following clarifications regarding the terms ready retrieval and structural defects.

The two basic reasons to return a cask to the spent fuel pool and unload the spent fuel assemblies are either to (1) retrieve the fuel assemblies for further processing or disposal, or (2) respond to an event or condition that has potentially degraded the design requirements established for the cask. The staff has not identified the unloading of a cask as a required protective measure to be taken within a specified time in order to limit the offsite consequences of an accident involving the release of radioactive material from a storage cask.

In regard to the requirements that cask designs must allow retrieval of the spent fuel for further processing or disposal (10 CFR 72.122(1)), the NRC has consistently taken a position that licensees can satisfy this requirement without maintaining the capability to retrieve the spent fuel from a cask within a specified period of time, and may, if necessary, develop alternate options for fuel retrieval if a cask unloading cannot be immediately supported due to a shortage of space in a spent fuel pool. This is considered acceptable because licensees have a great deal of flexibility in their ability to schedule and plan for the transfer of spent fuel from a storage cask to another cask for storage or shipment.

Several of the actions required by ISFSI technical specifications or cask certificates of compliance specify that, in the case of certain events or conditions, a cask may need to be unloaded, or otherwise returned to a safe storage condition. The NRC staff has stated that the potential need to unload a cask in response to an event or condition in the technical specifications or certificates of compliance does not require licensees to maintain a continuous ability to unload a cask within a specified time. This position is based on the absence of an identified event or condition involving the storage casks that would result in an immediate threat to public health and safety. The position is reflected in past NRC decisions such as the acceptability of (1) licensees not having to maintain space in spent fuel pools to accommodate

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unloading of a cask, and (2) several licensees sharing a single cask transport vehicle between different reactor sites.

In the specific case of the Prairie Island ISFSI, the NRC staff, in its Safety Evaluation Report dated July 1993, stated that its review of the accident analyses determined that, "Dose equivalent consequences, from a single cask, to any individual, from direct or indirect radiation and gaseous activity release after postulated accident events, are less than the 50 mSv (5 rem) limit established in 10 CFR 72.106(b)." Additionally, in its Environmental Assessment, dated July 28, 1992, the staff assessed the accident dose at the site boundary as, "... a small fraction ... of the criteria specified...." and found that, "The doses are also much less than the Protective Action Guides established by the Environmental Protection Agency (EPA) for individuals exposed to radiation as a result of accidents." Because it has been shown that the dose equivalent to any individual from postulated accidents involving a single cask is below levels required for taking protective actions to protect public health, the NRC staff considers that a time-urgent unloading of a TN-40 cask is a highly unlikely event. However, following certain events or conditions, the licensee is required to take corrective actions to ensure safe storage conditions and to perform inspections to ensure a cask continues to meet applicable design requirements. This may include returning a cask to the Auxiliary Building and/or the spent fuel pool. However, once the cask is in the spent fuel pool, it does not have to be unloaded immediately to maintain safe storage conditions. The licensee would have time to consider available options, required precautions, and other special considerations that may be involved in the required unloading of a cask.

The storage methods for spent fuel must protect against degradation of fuel assemblies or casks that would create operational safety problems during unloading. Operational safety problems are those that involve gross rupture of the fuel cladding such that significant quantities of fuel material and fission products are released to the storage environments. The design requirement to maintain fuel cladding integrity during storage leads to restrictions on the fuel assemblies that can be initially loaded into the casks. Acceptance criteria for fuel assemblies to be stored pertain to heat generation rates, initial enrichments, assembly geometry, and other characteristics that establish boundary conditions for the analysis of fuel assembly performance during normal storage and potential off-normal conditions. The wording of Prairie Island ISFSI Technical Specification 3.1.1.(6) and the safety analysis report should be interpreted in light of the regulatory background set forth in this paragraph.<sup>1</sup> In addition, a

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<sup>1</sup>TS 3.1.1.(6)- Fuel assemblies known or suspected to have structural defects or gross cladding failures (other than pinhole leaks) sufficiently severe to adversely affect fuel handling and transfer capability shall not be loaded into the cask for storage.

SAR 3.1.1- ...Physical Configuration/Condition: fuel assembly shall be intact, shall have no known cladding defects and shall not have physical damage which would inhibit insertion or removal from the cask fuel basket.

definition for "gross cladding defect" has been incorporated into NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems," which was recently issued in final form.

In the specific case of Prairie Island, neither 10 CFR 72.122(1) or specific ISFSI technical specifications introduce additional requirements for the fuel handling equipment used to actually load or unload the fuel assemblies into the cask since such matters are addressed under existing 10 CFR Part 50 regulations and licenses.<sup>2</sup> The structural requirements defined by the ISFSI SAR and technical specification are satisfied even if it is necessary to use a special handling tool to overcome problems in lifting selected fuel assemblies, provided that these assemblies do not have gross cladding failures and will otherwise maintain fuel assembly geometries assumed in the design-basis analyses performed for the cask. The adequacy of the licensee's actions should be judged in the context of the regulations in 10 CFR Part 50 and the associated reactor facility operating license. If the licensee's actions are reasonable for the handling of fuel within the spent fuel pool, those same actions can be credited in the determination of whether the licensee satisfies the structural integrity requirements of the ISFSI technical specification and fuel retrievability requirement of 10 CFR 72.122(1). If, on the other hand, the licensee's corrective actions are deemed inadequate or the special fuel handling procedure increases the probability of a fuel handling accident within the reactor facility, actions or inquiries from the NRC staff should be presented in the context of regulations such as Appendix B to 10 CFR 50 or 10 CFR 50.59.

The NRC Office of the General Counsel has reviewed this response and has no legal objections.

Please contact William Reckley of my staff at (301) 415-1314 if you have any additional questions or concerns regarding this matter.

cc (w/incoming): C. Hehl, RI  
B. Mallett, RII  
R. Scarano, RIV

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<sup>2</sup> Prairie Island ISFSI Technical Specification 1.3.2, "Fuel and Cask Handling Activities," states:

Fuel and cask movement and handling activities which are to be performed in the Prairie Island Nuclear Generating Plant Auxiliary Building will be governed by the requirements of the Prairie Island Nuclear Generating Plant Facility Operating Licenses DPR-42 and DPR-60 and associated technical specifications.