April 26, 2005

Mr. L. M. Stinson
Vice President
Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
P.O. Box 1295
Birmingham, AL 35201

SUBJECT: REGARDING SOUTHERN NUCLEAR OPERATING COMPANY, INC. REQUEST FOR EXEMPTION FROM 10 CFR 72.124(c) - CRITICALITY MONITORS

Dear Mr. Stinson:

This is in response to your January 19, 2005, letter requesting an exemption from 10 CFR 72.124(c) for criticality monitors associated with operation of the Edwin I. Hatch Nuclear Plant (HNP) and Joseph M. Farley Nuclear Plant (FNP) Independent Spent Fuel Storage Installations (ISFSIs). For the reasons set forth below, we have concluded that an exemption from 72.124(c) is not necessary as the regulatory requirement would be satisfied by the HNP and FNP operational approach as described in your letter.

The provisions of 10 CFR 72.124(c) state that:

> "Criticality Monitoring. A criticality monitoring system shall be maintained in each area where special nuclear material is handled, used, or stored which will energize clearly audible alarm signals if accidental criticality occurs. Underwater monitoring is not required when special nuclear material is handled or stored beneath water shielding. Monitoring of dry storage areas where special nuclear material is packaged in its stored configuration under a license issued under this subpart is not required."

As noted in your request, both HNP and FNP have a need to maintain sufficient spent fuel storage capacity in their respective spent fuel pools to provide the capability for a full-core offload for all operating units. To do so requires loading of the spent fuel in U.S. Nuclear Regulatory Commission (NRC) approved casks into an ISFSI under the conditions of the applicable certificate of compliance (CoC).

Your exemption request was based on interpreting the applicability of 10 CFR 72.124(c) after the Multi-Purpose Canister (MPC) is loaded with spent fuel and placed in a transfer cask but before it might be considered in its stored configuration. Some guidance on when the provisions of 10 CFR 72.124(c) apply appeared in an NRC letter to Holtec International dated August 1, 2000, which stated that the spent fuel is not considered to be packaged in its stored configuration until the MPC is drained, dried, inerted, and the confinement boundary established, and until such a condition is reached criticality monitoring under the provisions of 10 CFR 72.124(c) would be required.

Based on the information contained in the enclosures submitted with your exemption request, the NRC staff noted that both HNP and FNP utilize radiation monitors in the spent fuel handling area in compliance with the General Design Criterion 63 of 10 CFR 50 Appendix A, which states that:

> "Appropriate systems shall be provided in fuel storage and radioactive waste systems and associated handling areas (1) to detect conditions that may result in loss of residual heat removal capability and excessive radiation levels and (2) to initiate appropriate safety actions"

These radiation monitoring features include the use of gamma radiation monitors that provide local audible and remote alarms if radiation levels are exceeded. Although the radiation monitors are not specifically designed to monitor for an inadvertent criticality, the radiation monitors in the spent fuel areas are set to alarm at a maximum setpoint of 20 mrem/hr per the Technical Specifications for both HNP and FNP and provide the capability of detecting the high radiation levels that would result from a criticality event. This alarm would audibly inform local personnel that evacuation of the area was necessary under your emergency response activities as well as inform the control room of the event.

In evaluating the exemption request, the NRC staff noted that HNP and FNP already have measures in place to prevent an inadvertent or accidental criticality through compliance with their 10 CFR Part 50 license and Technical Specifications, including geometric spacing of fuel assemblies in both the fuel storage areas and spent fuel pool, administrative controls imposed on fuel handling procedures, and the use of nuclear instrumentation. Furthermore, as stated in the HI-STORM 100 Final Safety Analysis Report (FSAR), Section 6.1, the highest reactivity encountered in the MPC is when it is fully flooded and contains a complete fresh fuel loading. No credit is taken for fuel burnup. Once the spent fuel is transferred from the spent fuel storage racks to the MPC, the MPC lid is placed on the transfer cask containing the loaded MPC and moved to the reactor head laydown area. No further changes are made to the configuration of the cask or its contents prior to removing it from the spent fuel cask pit other than removing the water in the MPC and welding on the lid. One noticeable difference is when loading an MPC-32 cask at FNP. The Technical Specifications allow for the addition of borated water to the MPC during MPC closure operations, however, the presence of the lid would inhibit any significant potential boron dilution in the MPC. In both cases, the action of removing the water during closure operations further reduces any criticality concerns of the cask due to under moderation of the cask system.

The applicant has analyzed the spent fuel storage casks and storage at Independent Spent Fuel Storage Installations (ISFSIs) used at HNP and FNP based on the criteria outlined in our Standard Review Plan (SRP) that evaluate normal and credible off-normal conditions of spent fuel cask operations, including the loading and unloading of spent fuel storage casks. Although the lid is not yet welded down during the period of time described in your exemption request letter, the lid is in place and no further handling of the individual fuel assemblies takes place, and the contents and all criticality control design features are in a static state and are not purposely modified or disturbed and are therefore bounded by the safety analyses.

Based on the administrative controls, bounding analyses of cask design and operation, and that the radiation monitoring features provided pursuant to General Design Criterion 63 are sufficient to notify personnel in the event of an unlikely inadvertent criticality, no exemption from the requirements of 10 CFR 72.124(c) is deemed necessary to allow normal cask loading and unloading operations at HNP and FNP during the potential gap identified by your staff and outlined above. Compliance would be assured by the measures described in the Southern Nuclear Operating Company supporting information for the exemption.

Note that although the radiation monitors are capable of fulfilling the role of criticality monitoring pursuant to 10 CFR 72.124(c) during the specific operations identified in your exemption request letter, and although they share many of the same features, the NRC staff has not concluded that they are capable of fulfilling the specific radiation detection requirements described in 10 CFR 70.24. Your exemption request identified specific conditions where criticality monitoring under 10 CFR 72.124(c) would be required. These conditions were sufficiently limited in scope to the loading and unloading operations that had been evaluated per the requirements of the SRP that the NRC has reasonable assurance based on the relative low risks of this operation that the criticality monitoring requirement is met by the described operations including the radiation monitoring already in place.

If you have any questions, please contact Mr. Jeremy Smith of my staff at 301-415-8500. The NRC staff is always willing to work with licensees in interpreting the regulations. Any future correspondence related to this action should reference Docket Numbers 72-36 and 72-42 and TAC Numbers L23803 and L23804 respectively.

Sincerely,

/RA/

Robert Lewis, Chief
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-36
72-42
TAC No. L23803
L23804

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Sincerely,

/RA/

Robert Lewis, Chief
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-36
72-42
TAC No. L23803
L23804

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