

June 20, 1996

Mr. D. N. Morey  
Vice President  
Southern Nuclear Operating  
Company, Inc.  
P. O. Box 1295  
Birmingham, Alabama 35201

SUBJECT: ENVIRONMENTAL ASSESSMENT OF REQUEST FOR EXEMPTION FROM 10 CFR 70.24  
CRITICALITY MONITORING REQUIREMENTS - JOSEPH M. FARLEY NUCLEAR  
PLANT, UNITS 1 AND 2 (TAC NOS. M95496 AND M95497)

Dear Mr. Morey:

Enclosed for your information is a copy of an "Environmental Assessment and Finding of No Significant Impact." This assessment relates to your application dated May 31, 1996, which requested an exemption from certain requirements of 10 CFR 70.24, "Criticality Accident Requirements." This section requires a criticality monitoring system for the receipt, possession, inspection, and storage of special nuclear materials in the form of unirradiated fuel assemblies that are not handled or stored beneath water shielding, and requires maintaining emergency procedures for responding to the criticality monitoring system alarm, conducting drills to meet the emergency procedures, and designating responsible individuals to determine the cause of the alarm.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

Byron L. Siegel, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

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Docket Nos. 50-348  
and 50-364

Enclosure: Environmental Assessment

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script, appearing to read "Byron L. Siegel".

Byron L. Siegel, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-348  
and 50-364

Enclosure: Environmental Assessment

cc w/encl: See next page

Mr. D. N. Morey  
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Company, Inc.

Joseph M. Farley Nuclear Plant

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UNITED STATES NUCLEAR REGULATORY COMMISSION

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

DOCKET NOS. 50-348 AND 50-364

JOSEPH M. FARLEY NUCLEAR PLANTS, UNITS 1 AND 2

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from certain requirements of its regulations for Facility Operating License Nos. NPF-2 and NPF-8, issued to Southern Nuclear Operating Company, Inc. (the licensee), for operation of the Joseph M. Farley (Farley) Nuclear Plants, Units 1 and 2, located in Houston County, Alabama.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action:

The proposed action would exempt the licensee from the requirements of 10 CFR 70.24, which requires a monitoring system that will energize clearly audible alarms if accidental criticality occurs in each area in which special nuclear material is handled, used, or stored. The proposed action would also exempt the licensee from the requirements of 10 CFR 70.24(a)(3) to maintain emergency procedures for each area in which this licensed special nuclear material is handled, used, or stored to ensure that all personnel withdraw to an area of safety upon the sounding of the alarm and to conduct drills and designate responsible individuals for such emergency procedures.

The proposed action is in accordance with the licensee's application for exemption dated May 31, 1996.

The Need for the Proposed Action:

Power reactor license applicants are evaluated for the safe handling, use, and storage of special nuclear materials. The proposed exemption from criticality accident requirements is based on the original design for radiation monitoring at Farley. Exemptions from the requirements of 10 CFR 70.24(a) "Criticality Accident Requirements" were granted in the Special Nuclear Material (SNM) licenses for each unit as part of the 10 CFR Part 70 license. However, with the issuance of the Part 50 license this exemption expired because it was inadvertently omitted in that license. Therefore, the exemption is needed to clearly define the design of the plant as evaluated and approved for licensing.

Environmental Impacts of the Proposed Action:

The NRC staff has completed its evaluation of the proposed action and concludes that there is no significant environmental impact if the exemption is granted. Inadvertent or accidental criticality will be precluded through compliance with the Farley Technical Specifications, the geometric spacing of fuel assemblies in the new fuel storage facility and spent fuel storage pool, and administrative controls imposed on fuel handling procedures.

Inadvertent or accidental criticality of SNM while in use in the reactor vessel is precluded through compliance with the Farley Technical Specifications, including reactivity requirements (e.g., shutdown margins, limits on control rod movement), instrumentation requirements (e.g., reactor power and radiation monitors), and controls on refueling operations (e.g., control rod interlocks and source range monitor requirements). In addition, the operators' continuous attention directed toward instruments monitoring behavior of the nuclear fuel in the reactor assures that the facility is

operated in such a manner as to preclude inadvertent criticality. Finally, since access to the fuel in the reactor vessel is not physically possible while in use and is procedurally controlled during refueling, there are no concerns associated with loss or diversion of the fuel.

SNM as nuclear fuel is stored in one of two locations—the spent fuel pool or the new fuel storage area. The spent fuel pool is used to store irradiated fuel under water after its discharge from the reactor. The pool is designed to store the fuel in a geometric array that precludes criticality. In addition, existing Technical Specification limits on  $k_{eff}$  are maintained less than or equal to 0.95, even in the event of a fuel handling accident.

The new fuel storage area is used to receive and store new fuel in a dry condition upon arrival on site and prior to loading in the reactor. The new fuel storage area is designed to store new fuel in a geometric array that precludes criticality. In addition, existing safety evaluations demonstrate that  $k_{eff}$  is maintained less than or equal to 0.95 when the new fuel racks are fully loaded and dry or flooded with unborated water and less than or equal to 0.98 for optimum moderation conditions (e.g., because of the presence of aqueous foam or mist) or in the event of a fuel handling accident.

Fresh fuel is shipped in a plastic wrap. In some cases the fuel is stored in the new fuel storage racks with the plastic wrap in place and in other cases the plastic wrap is removed prior to storage. In all cases where fuel is stored with the plastic wrap in place, the wrap either cannot hold water due to its design or it is rendered incapable of holding water prior to fuel storage. Therefore, there is no concern that the plastic wrap used as part of fresh fuel storage will hold water from flooding from overhead sources. Additionally, as discussed above, the new fuel storage racks have

been analyzed for a postulated flooded condition and the results showed that  $k_{eff}$  is maintained less than or equal to 0.95.

Both irradiated and unirradiated fuel is moved to and from the reactor vessel, and the spent fuel pool to accommodate refueling operations. Also, unirradiated fuel can be moved to and from the new fuel storage area. In addition, movements of fuel into the facility and within the reactor vessel or within the spent fuel pool occur. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. Moreover, previous accident analyses have demonstrated that a fuel handling accident (i.e., a dropped fuel element) will not create conditions which exceed design specification. In addition, the Technical Specifications specifically address the refueling operations and limit the handling of fuel to ensure against an accidental criticality and to preclude certain movements over the spent fuel pool and the reactor vessel.

In summary, exemptions from the requirements of 10 CFR Part 70, Section 70.24 approved by the NRC in connection with the SNM licenses for Farley Units 1 and 2 were based upon NRC's finding that the inherent features associated with the storage and inspection of unirradiated fuel established good cause for granting the exemption and that granting such an exemption at this time will not endanger public life or property or the common defense and security and is otherwise in the public interest. The training provided to all personnel involved in fuel handling operations, the administrative controls, the Technical Specifications on new and spent fuel handling and storage, and the design of the new and spent fuel storage racks in place preclude inadvertent or accidental criticality. Since the facilities, storage, and inspection and procedures currently in place are consistent with

those in place at the time the exemptions were granted in connection with the SNM licenses, an exemption from 10 CFR 70.24 is appropriate.

The proposed exemption will not affect radiological plant effluents nor cause any significant occupational exposures. Only a small amount, if any, of radioactive waste is generated during the receipt and handling of new fuel (e.g., smear papers or contaminated packaging material). The amount of waste would not be changed by the exemption.

With regard to potential nonradiological impacts, the proposed exemption involves systems located within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Accordingly, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

Since the Commission has concluded that there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. The principal alternative would be to deny the requested exemption. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the Final Environmental Statement related to the operation of Joseph M. Farley Nuclear Plant, Units 1 and 2, dated June 1972.



Agencies and Persons Consulted:

In accordance with its stated policy, on June 14, 1996, the staff consulted with the Alabama State official, Mr. Kirk Whatley, of the Alabama Department of Public Health, regarding the environmental impact of the proposed action. The State official had no comments.

FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated May 31, 1996, which is available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC and at the local public document room located at the Houston-Love Memorial Library, 212 W. Burdeshaw Street, Post Office Box 1369, Dolthan, Alabama.

Dated at Rockville, Maryland, this 20th day of June 1996.

FOR THE NUCLEAR REGULATORY COMMISSION



Byron L. Siegel, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation