

July 31, 1996

Mr. D. N. Morey  
Vice President - Farley Project  
Southern Nuclear Operating Company  
Post Office Box 1295  
Birmingham, Alabama 35201-1295

SUBJECT: 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:

The Commission has issued the enclosed exemption from the requirements of 10 CFR 70.24, "Criticality Accident Requirements" for the Joseph M. Farley Nuclear Plant, Units 1 and 2. This exemption is related to your application dated May 31, 1996.

A copy of the exemption 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

Docket Nos. 50-348  
and 50-364

Enclosure: Exemption

cc w/encl: See next page

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\*\*see concurrence on exemption

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DATE	7/9/96	7/9/96	7/10/96	7/9/96	7/10/96	7/11/96	7/17/96

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 31, 1996

Mr. D. N. Morey  
Vice President - Farley Project  
Southern Nuclear Operating Company  
Post Office Box 1295  
Birmingham, Alabama 35201-1295

SUBJECT: 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:

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A copy of the exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

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: Exemption

cc w/encl: See next page

Mr. D. N. Morey  
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Joseph M. Farley Nuclear Plant

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U.S. Nuclear Regulatory Commission  
7388 N. State Highway 95  
Columbia, Alabama 36319

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
SOUTHERN NUCLEAR OPERATING COMPANY	)	Docket Nos. 50-348 and 50-364
	)	
(Joseph M. Farley Nuclear Plant,	)	
Units 1 and 2)	)	

EXEMPTION

I.

The Southern Nuclear Operating Company, et al. (SNC or the licensee) is the holder of Facility Operating License Nos. NPF-2 and NPF-8 for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Farley). The licenses provide, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

II.

Subsection (a) of 10 CFR 70.24, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material shall maintain in each area where such material is handled, used, or stored, an appropriate criticality monitoring system. In accordance with Subsection (a)(1) of 10 CFR 70.24, coverage of all such areas at Farley shall be provided by two criticality detectors. However, exemptions may be requested pursuant to 10 CFR 70.24(d), provided that the licensee believes that good cause exists for the exemption.

By letter dated May 31, 1996, the licensee requested an exemption from the requirements of 10 CFR 70.24. A previous exemption from the provisions of 10 CFR Part 70.24 for the storage of special nuclear material, including reactor fuel assemblies [maximum amount of 1,900 kg of U-235 in uranium enriched to no more than 3.15 weight percent (w/o)], was granted to Alabama Power Company for Farley Unit 1 in NRC Materials License No. SNM-1647 and for Farley Unit 2 in NRC Materials License No. SNM-1868. The materials licenses were issued on July 20, 1976, for Unit 1 and March 12, 1980, for Unit 2.

The materials licenses expired upon conversion of the construction permits to operating licenses, which was June 26, 1977, for Unit 1 and March 31, 1981, for Unit 2, respectively. The basis for the current exemption request is the same as for the original request. Specifically, the licensee proposes to handle and store unirradiated fuel without having a criticality monitoring system as required by 10 CFR 70.24.

The basis for the exemption is that 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 Special Nuclear Materials (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' 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 (NFSA). 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 NFSA design precludes criticality by maintaining an effective multiplication factor less than or equal to 0.95 when the racks are fully loaded and in the normal dry condition or flooded with unborated water. The effective multiplication factor is also less than or equal to 0.98 under optimum moderation conditions (e.g., because of the presence of aqueous foam or mist). The NFSA is used to receive and store new fuel in a dry condition upon arrival on site and prior to loading in the reactor. Administrative controls encompass placing the assemblies in the fuel inspection stand, performing inspection activities, and lifting and placement of the assemblies into specified locations in the NFSA.

The NFSA is protected from the effects of natural phenomena, including earthquakes, tornadoes, hurricanes, floods, and external missiles. The NFSA is designed to perform its intended function and maintain structural integrity after a safe shutdown earthquake (SSE) or following a postulated hazard, such as fire, internal missiles, or pipe break.

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 in accordance with the Receipt of New Fuel Procedure 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 due to flooding from overhead sources. Additionally, as discussed above, the new fuel storage racks have been analyzed by the licensee 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 and within the spent fuel pool occur. 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 specifications. 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.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical. The circumstances for granting an exemption to 10 CFR 70.24 are met because criticality is precluded with the present design configuration, Technical Specifications requirements, administrative controls, and the fuel handling equipment and procedures. Therefore, the staff concludes that the licensee's request for an exemption from the requirements of 10 CFR 70.24 is acceptable and should be granted.

### III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 70.14, this exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby grants Southern Nuclear Operating Company an exemption as described in Section II above from 10 CFR 70.24, "Criticality Accident Requirements" for Farley Units 1 and 2.



Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the quality of the human environment (61 FR 33781).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By  
WILLIAM T. RUSSELL

William T. Russell, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this 31st day of July 1996.

\* see previous concurrence

*Not required*

OFFICE	LA:PD22:DRPE	E	PM:PDII-2	SRXB*	SPLB*	PERB *	OGC*
NAME	LBerry		BSiegel:cdw	RJones	TMarsh	CMiller	AHodgdon
DATE	7/31/96		/ /96	07/01/96	07/05/96	/ /96	07/01/96
OFFICE	D:PDII-2 *		D:DRPE *	ADP *	D:NRR		
NAME	HBerkow		SVarga	RZimmerman	WRussell		
DATE	7/9/96		7/10/96	7/11/96	7/17/96	/ /96	/ /96

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Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the quality of the human environment (61 FR 33781).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



William T. Russell, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this 31st day of July 1996.