October 28, 1996

Mr. E. E. Fitzpatrick, Vice President
Indiana Michigan Power
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: EXEMPTION FROM 10 CFR 70.24 CRITICALITY MONITORING REQUIREMENTS - DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 (TAC NOS. M95197 AND M95198)

Dear Mr. Fitzpatrick:

The Commission has issued the enclosed exemption from the requirements of 10 CFR 70.24, "Criticality Accident Requirements," for the Donald C. Cook Nuclear Plant, Units 1 and 2. This exemption is related to your application dated April 8, 1996.

We find that granting this exemption from the requirements of 10 CFR 70.24 is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.

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

Sincerely,

Original signed by:
John B. Hickman, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosure: Exemption

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cc:

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Attorney General
Department of Attorney General
525 West Ottawa Street
Lansing, Michigan 48913

Township Supervisor
Lake Township Hall
P.O. Box 818
Bridgman, Michigan 49106

Al Blind, Site Vice President
Donald C. Cook Nuclear Plant
1 Cook Place
Bridgman, Michigan 49106

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
7700 Red Arrow Highway
Stevensville, Michigan 49127

Gerald Charnoff, Esquire
Shaw, Pittman, Potts and Trowbridge
2300 N Street, N. W.
Washington, DC 20037

Mayor, City of Bridgman
Post Office Box 366
Bridgman, Michigan 49106

Special Assistant to the Governor
Room 1 - State Capitol
Lansing, Michigan 48909

Drinking Water and Radiological
Protection Division
Michigan Department of
Environmental Quality
3423 N. Martin Luther King Jr Blvd
P. O. Box 30630 CPH Mailroom
Lansing, Michigan 48909-8130

Mr. Steve J. Brewer
Indiana Michigan Power
Nuclear Generation Group
500 Circle Drive
Buchanan, Michigan 49107

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Indiana Michigan Power Company	)	Docket Nos. 50-315
	)	and 50-316
(D.C. Cook Nuclear Plant, Units 1 and 2)	)	
	)	

EXEMPTION

I.

Indiana Michigan Power Company (IMPCo, the licensee) is the holder of Facility Operating License Nos. DPR-58 and DPR-74 which authorize operation of the Donald C. Cook Nuclear Plant, Units 1 and 2, respectively. The Cook facilities are pressurized water reactors located at the licensee's site in Berrien County, Michigan. The license provides, among other things, that the facility 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 (SNM) shall maintain in each area where such material is handled, used, or stored, an appropriate criticality monitoring system.

In accordance with the Technical Specifications for D. C. Cook, Units 1 and 2, the monitoring requirements of 10 CFR 70.24(a)(2) are applicable. Subsection (a) of 10 CFR 70.24 also requires that emergency procedures be maintained for each area in which licensed SNM is handled, used, or stored to ensure that all personnel withdraw to an area of safety upon the sounding of the alarm. These procedures must include the conduct of drills to familiarize

personnel with the evacuation plan, designation of responsible individuals for determining the cause of the alarm, and placement of radiation survey instruments in accessible locations for use in such an emergency. 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 April 8, 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 SNM, including reactor fuel assemblies [maximum amount of 2313 kg of U-235 in uranium enriched to no more than 3.15 weight percent (w/o)], was granted to Indiana and Michigan Power Company for D.C. Cook Unit 2 in NRC Materials License No. SNM-1753. The materials license was issued on August 18, 1977. No similar exemption was issued for the Unit 1 materials license; however, the fuel storage facilities were common to both units. The previously issued exemption expired when the materials license expired upon conversion of the construction permit to an operating license on December 23, 1977, for Unit 2. 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 or emergency procedures 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 Cook 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 Cook 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., refueling boron concentration 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 vault. 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 vault 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 under full water density flooded conditions. The effective multiplication factor is also less than or equal to 0.98 under optimum moderation conditions. The new fuel vault 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 new fuel vault.

The new fuel vault is protected from the effects of natural phenomena, including earthquakes, tornadoes, hurricanes, floods, and external missiles. The auxiliary building which houses the new fuel vault is designed to Seismic Class I by a dynamic analysis using Response Spectrum and Modal Analysis Procedure to maintain structural integrity after a safe shutdown earthquake (SSE) or following a postulated hazard, such as fire, internal missiles, or pipe break. The new fuel racks are designed to Seismic Class III by an analysis using the procedures of the Uniform Building Code.

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. Fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. 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 Indiana Michigan Power Company an exemption as described in Section II above from 10 CFR 70.24, "Criticality accident requirements," for D.C. Cook, 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 39672).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 28th day of October 1996.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by:

Frank J. Miraglia, Acting Director
Office of Nuclear Reactor Regulation

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