



LOG. No. PI-NRR/CEI-07436

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

September 26, 1994

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Mr. Robert A. Stratman  
Vice President Nuclear - Perry  
Centerior Service Company  
P.O. Box 97, A200  
Perry, Ohio 44081

SUBJECT: EXEMPTION FROM 10 CFR 70.24 REGARDING CRITICALITY MONITORING  
SYSTEM REQUIREMENTS FOR NEW FUEL AT PERRY NUCLEAR POWER PLANT  
(TAC NO. M82974)

Dear Mr. Stratman:

In response to your letter dated February 28, 1992, the Commission has issued the enclosed Exemption from 10 CFR 70.24, "Criticality Accident Requirements." We conclude that your request for exemption from the requirements of 10 CFR 70.24 is appropriate and acceptable, as stated in the enclosed Exemption.

The Exemption applies to new, unirradiated fuel assemblies, and is issued subject to certain restrictions. The Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Jack W. Roe, Director  
Division of Reactor Projects, III and IV  
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosure: Exemption

cc w/encl: See Attached List

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
The Cleveland Electric Illuminating	)	Docket No. 50-440
Company, Centerior Service Company,	)	
Duquesne Light Company, Ohio	)	
Edison Company, Pennsylvania	)	
Power Company, and, Toledo Edison	)	
Company	)	

EXEMPTION

I.

The Cleveland Electric Illuminating Company, Centerior Service Company, Duquesne Light Company, Ohio Edison Company, Pennsylvania Power Company, and Toledo Edison Company (the licensees) hold Facility Operating License No. NPF-58, which authorizes operation of the Perry Nuclear Power Plant (PNPP), Unit No. 1. The license provides, among other things, that the facility is subject to all rules, regulations and orders of the Nuclear Regulatory Commission (the Commission) now and hereafter in effect. This facility is a boiling water reactor located on the shore of Lake Erie in Lake County, Ohio, approximately 35 miles northeast of Cleveland, Ohio, and approximately 23 miles southwest of Ashland, Ohio.

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 PNPP, Unit No. 1, shall be provided by two criticality detectors. However, exemptions may be requested pursuant to 10 CFR 70.24(d), provided that the licensee believes

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that good cause exists for the exemption. In particular, Regulatory Guide 8.12, Revision 2, "Criticality Accident Alarm System," states that it is appropriate to request an exemption from 10 CFR 70.24 if an evaluation determines that a potential for criticality does not exist, as for example where geometric spacing is used to preclude criticality.

By letter dated February 28, 1992, 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 2,602 kg of U-235 in uranium enriched to no more than 3.00 weight percent (<sup>w%</sup>~~w/o~~)), was granted to PNPP in NRC Materials License No. SNM-1928. The materials license was issued on March 7, 1985, and expired upon conversion of the construction permit to an operating license on November 13, 1986. The bases for the current exemption request is the same as for the original 1985 request. Specifically, the licensees propose to handle and store unirradiated fuel in the fuel handling building in the new fuel pool without having a criticality monitoring system with two separate criticality detectors as required by 10 CFR 70.24.

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The bases for the exemption is that the potential for accidental criticality is precluded because of the geometric spacing of fuel in the storage pool and administrative controls imposed in fuel handling procedures from the time the fuel is removed from approved shipping containers, until it is placed in specially designed storage racks. Administrative control encompass placing the assemblies in the fuel inspection stand, receipt inspection activities, and lifting and placement of the assemblies into specified locations into the new fuel storage vaults. Design of the new fuel racks precludes criticality, i.e., an effective multiplication factor of 0.95

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or less in the normal dry condition or abnormal completely water flooded condition. Criticality during optimal moderation (foam, small droplets, spray, or fogging) is precluded by storing new fuel assemblies in the new fuel vaults in alternate rows and columns. Administrative controls will prevent placement of each fuel assembly in adjacent storage cells. Restrictions on this exemption ensure that personnel are trained, equipment is operable, an assembly storage plan is developed, reviewed, and approved, and verification is undertaken by the Reactor Engineer or licensed Senior Reactor Operator at the completion of each fuel assembly transfer to ensure criticality is precluded. These restrictions are listed in the enclosure as items 1, 2, 3, and 4. Restriction 5 requires performing and maintaining criticality analyses documenting that the maximum effective multiplication factor for each fuel assembly does not exceed 0.95 when optimally moderated and fully reflected by water. Restriction 6 limits maximum fuel enrichment to 5 <sup>w/o</sup> ~~w/o~~ of U-235 independent of the results of analyses performed in accordance with Restriction 5. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high (Restriction 7). No more than three fuel assemblies shall be outside their shipping containers or storage racks at any one time (Restriction 8). The minimum edge-to-edge distance between the group of three fuel assemblies and all other fuel assemblies shall be 12 inches (Restriction 9).

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Based upon the information provided, there is reasonable assurance that unirradiated fuel will remain subcritical because of the new fuel pool design and administrative controls. The special circumstances for granting an exemption to 10 CFR 70.24 are met because criticality is precluded with the present design configuration, Technical Specification requirements, and the

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restrictions placed upon the exemption. Therefore, the staff concludes that the licensee's request for an exemption from the requirements of 10 CFR 70.24 for unirradiated fuel in the fuel handling building is acceptable and should be granted. This exemption is subject to the restrictions listed in the enclosure.

## III.

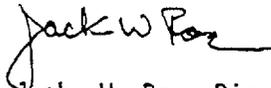
Accordingly, the Commission has determined that, pursuant to 10 CFR 70.14, an exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest.

Accordingly, the Commission hereby grants an exemption as described in Section II above from 10 CFR 70.24, "Criticality Accident Requirements," such that the licensee is exempt from providing two criticality detectors. This exemption is subject to the restrictions in the enclosure.

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 (59 FR 47363).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Dated at Rockville, Maryland  
the 26th day of September 1994

## ENCLOSURE

EXEMPTION RESTRICTIONS

1. The following training program shall be completed by each individual prior to participation in the radiation safety and/or fuel handling programs:
  - (a) All radiation safety personnel involved in new fuel receipt, inspection and storage shall be trained in radiation safety and in PNPP, Unit 1, radiation protection procedures related to the receipt, handling, and/or storage of new fuel assemblies prior to receipt of the new fuel.
  - (b) All operations and contractor personnel involved in the receipt, handling, and/or storage of new fuel assemblies shall receive training in the related procedures including the <sup>health</sup> ~~health~~ and safety aspects of the activities prior to receipt of new fuel. ← per and ink corrections per NRC telcom 10/7/94 B.F. Farrell
2. All preoperational (function) testing for components associated with receipt, inspection, movement, and storage of new fuel assemblies shall have been completed prior to commencing receipt of new fuel assemblies.
3. Prior to storing fresh fuel assemblies in the New Fuel Storage Vaults, the licensee shall develop a documented fuel assembly storage plan indicating the specific storage location of each assembly. The plan shall show that the fuel assemblies are stored only in alternate rows and columns and be approved by the Reactor Engineer or by the Plant Operations Review Committee (PORC).
4. The Reactor Engineer or a licensed Senior Reactor Operator shall verify that proper spacing is maintained between assemblies during receipt and inspection of new fuel assemblies and ensure each assembly is placed in an authorized storage location at the completion of each new fuel assembly transfer to ensure that analyzed configurations are maintained to prevent inadvertent criticality.
5. Criticality analyses shall be performed and maintained that document the maximum effective multiplication factor for each fuel assembly must not exceed 0.95, when optimally moderated and fully reflected by water.
6. Fuel assemblies shall have a maximum enrichment of 5 <sup>w/o</sup> ~~w/o~~ U-235. ←
7. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high.
8. No more than three fuel assemblies shall be outside their shipping containers or storage racks at any one time.
9. The minimum edge-to-edge distance between the group of three fuel assemblies and all other fuel assemblies shall be 12 inches.