

June 27, 1997

Mr. James W. Langenbach, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P.O. Box 480
Middletown, PA 17057

SUBJECT: ENVIRONMENTAL ASSESSMENT OF REQUEST FOR EXEMPTION FROM
10 CFR 70.24 CRITICALITY ACCIDENT REQUIREMENTS -
THREE MILE ISLAND NUCLEAR GENERATING STATION, UNIT 1 (TMI-1)
(TAC NO. M97961)

Dear Mr. Langenbach:

Enclosed for your information is a copy of an "Environmental Assessment and Finding of No Significant Impact." This assessment relates to your application dated February 7, 1997, as supplemented March 26 and June 5, 1997, which requested an exemption from certain requirements of 10 CFR 70.24, "Criticality Accident Requirements."

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

Sincerely,

ORIGINAL SIGNED BY:

Bart C. Buckley, Senior Project Manager
Project Directorate 1-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure: Environmental Assessment

cc w/encl: See next page

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Three Mile Island Nuclear Station, Unit No. 1

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UNITED STATES NUCLEAR REGULATORY COMMISSIONGPU NUCLEAR CORPORATIONDOCKET NO. 50-289THREE MILE ISLAND NUCLEAR STATION, UNIT 1ENVIRONMENTAL ASSESSMENT AND FINDING OFNO 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 No. DRP-50 issued to GPU Nuclear Corporation (the licensee), for operation of Three Mile Island Nuclear Station, Unit 1 (TMI-1) located in Dauphin County, Pennsylvania.

ENVIRONMENTAL ASSESSMENTIdentification of Proposed Action:

The proposed action would exempt the GPU Nuclear Corporation from the requirements of 10 CFR 70.24(a), which requires a monitoring system that will energize clear 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 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, to familiarize personnel with the evacuation plan, and to designate responsible individuals for determining the cause of the alarm, and to place radiation survey instruments in accessible locations for use in such an emergency.

The proposed action is in accordance with the licensee's application for exemption dated February 7, 1997, as supplemented March 26 and June 5, 1997.

The Need for the Proposed Action:

The purpose of 10 CFR 70.24(a) is to ensure that if a criticality were to occur during the handling of special nuclear material, personnel would be alerted to that fact and would take appropriate action. At a commercial nuclear power plant, the inadvertent criticality with which 10 CFR 70.24 is concerned could occur during fuel handling operations. The special nuclear material that could be assembled into a critical mass at a commercial nuclear power plant is in the form of nuclear fuel; the quantity of other forms of special nuclear material that is stored on site is small enough to preclude achieving a critical mass. Because the fuel is not enriched beyond 5.0 weight percent Uranium-235 and because commercial nuclear plant licensees have procedures and design features that prevent inadvertent criticality, the staff has determined that inadvertent criticality is not likely to occur due to the handling of special nuclear material at a commercial power reactor. The requirements of 10 CFR 70.24(a), therefore, are not necessary to ensure the safety of personnel during the handling of special nuclear materials at commercial power reactors.

Environmental Impacts of the Proposed Action:

The Commission 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 TMI-1 Technical Specifications (TS), the design of the fuel storage racks providing geometric spacing of fuel assemblies in their

storage locations, and administrative controls imposed on fuel handling procedures. TS requirements specify reactivity limits for the fuel storage racks and minimum spacing between the fuel assemblies in the storage racks.

Appendix A of 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," Criterion 62, requires that criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations. This is met at TMI-1, as identified in Section 5.4.1 of the TS. TMI-1 TS Section 5.4-1 states that new fuel will normally be stored in the fuel storage vault or spent fuel pools.

For the new fuel storage vault, the fuel assemblies are stored in racks in parallel rows having a nominal center to center distance of 21-1/8 inches in both directions. The spacing in the new fuel storage vault is sufficient to maintain K_{eff} less than 0.95 based on storage of fuel assemblies in clean unborated water or less than 0.98 based on storage in an optimum hypothetical low density moderator (fog or foam) for fuel assemblies with a nominal enrichment of 5.0 weight percent U^{235} . When fuel is being stored in the new fuel storage vault, twelve (12) storage locations (aligned in two rows of six locations each; transverse row numbers four and eight) must be left vacant of fissile or moderating material to provide sufficient neutron leakage to satisfy the NRC maximum allowable reactivity value under the optimum low moderator density condition.

For Spent Fuel Pool "A," the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 11.1 inches in both directions for the Region I racks and 9.2 inches in both directions for

the Region II racks. The spacing in the Spent Fuel Pool "A" storage locations for both Regions I and II is adequate to maintain K_{eff} less than 0.95. Region I will store fuel with a maximum 5.0 percent initial enrichment. Region II will store new fuel with low enrichment. When fuel is being moved in or over the Spent Fuel Storage Pool "A" and fuel is being stored in the pool, a boron concentration of at least 600 ppmb must be maintained to meet the NRC maximum allowable reactivity value under the postulated accident condition.

For Spent Fuel Pool "B," the fuel assemblies are stored in racks in parallel rows, having nominal center to center distance of 13-5/8 inches in both directions. This spacing is sufficient to maintain a K_{eff} less than 0.95 based on fuel assemblies with a maximum enrichment of 4.37 weight percent U^{235} . When fuel is being moved in or over the Spent Fuel Storage Pool "B" and fuel is being stored in the pool, a boron concentration of at least 600 ppmb must be maintained to meet the NRC maximum allowable reactivity value under the postulated accident condition.

The proposed exemption would not result in any significant radiological impacts. The proposed exemption would not affect radiological plant effluent nor cause any significant occupational exposures since the TS, design controls, including geometric spacing of fuel assembly storage spaces, and administrative controls preclude inadvertent criticality. The amount of radioactive waste would not be changed by the proposed exemption.

The proposed exemption does not result in any significant non-radiological environmental impacts. The proposed exemption involves features located entirely 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. As an alternative to the proposed exemption, the staff considered denial of the requested exemption. Denial of the request would result in no change in current environmental impacts. 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 TMI-1 dated December 1972.

Agencies and Persons Consulted:

In accordance with its stated policy, on June 27, 1997, the staff consulted with the Pennsylvania State official, Mr. Maingi, Department of Environmental Protection, Bureau of Radiation Protection, 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 February 7, 1997, as supplemented March 26 and June 5, 1997, which are available for public inspection at the Commission's Public Document Room, which is located at The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Law/Government Publications Sections, State Library of Pennsylvania, Walnut Street and Commonwealth Avenues, Harrisburg, Pennsylvania.

Dated at Rockville, Maryland, this 27th day of June 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

Bart C. Buckley

Bart C. Buckley, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation