

June 26, 1995

Mr. T. Gary Broughton, Vice President
and Director - TMI-1
GPU Nuclear Corporation
Post Office Box 480
Middletown, PA 17057

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1) - ENVIRONMENTAL
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT REGARDING EXEMPTION FROM
10 CFR 50.44, 10 CFR 50.46, AND 10 CFR PART 50, APPENDIX K FOR
DEMONSTRATION FUEL ASSEMBLIES (TAC NO. M92441)

Dear Mr. Broughton:

Enclosed is a copy of an "Environmental Assessment and Finding of No Significant Impact" for your information. The assessment relates to your request dated June 1, 1995, for an exemption from 10 CFR 50.44, 10 CFR 50.46, and 10 CFR Part 50, Appendix K to enable the use of advanced cladding materials in two demonstration fuel assemblies during Cycles 11, 12, and 13 for TMI-1. The enclosed assessment relates to the requested exemption.

This assessment has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by

Ronald W. Hernan, Senior Project Manager Project
Directorate I-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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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Middletown, PA 17057

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A handwritten signature in black ink, reading "Ronald W. Hernan", is written over a horizontal line.

Ronald W. Hernan, Senior Project Manager
Project Directorate I-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

Mr. T. Gary Broughton
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

cc:

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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 the provisions of 10 CFR 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 to GPU Nuclear Corporation (GPUN; the licensee) for Three Mile Island Nuclear Station, Unit 1 (TMI-1), located in Dauphin County, Pennsylvania.

ENVIRONMENTAL ASSESSMENTIdentification of Proposed Action:

The proposed action would enable the licensee to use demonstration fuel assemblies that contain some fuel rods whose zirconium-based cladding composition is somewhat different from the zirconium based compound named zircaloy. These demonstration assemblies would be loaded into TMI-1 during the upcoming September 1995 refueling outage and irradiated through fuel Cycles 11, 12, and 13.

The proposed action is in accordance with the licensee's application for exemption of June 1, 1995.

The Need for the Proposed Action:

The proposed exemption to 10 CFR 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 is needed because these regulations specifically refer to light-water reactors containing fuel consisting of uranium oxide pellets

enclosed in zircaloy tubes. Zircaloy is a zirconium-based alloy currently in use as cladding for fuel pellets. A new zirconium-based cladding has been developed which is not the same chemical composition as zircaloy, and which the licensee wants to test in reactor operation. Since 10 CFR 50.46 and 10 CFR Part 50, Appendix K limit Emergency Core Cooling System (ECCS) calculations to zircaloy and 10 CFR 50.44 relates to the generation of hydrogen gas from a metal-water reaction with zircaloy, an exemption is required in order to place two demonstration assemblies in the core. The staff has reviewed the chemical composition of the new cladding and found no significant difference between the new composition and zircaloy. Therefore, pursuant to 10 CFR 50.12, a special circumstance exists in which application of these regulations is not necessary to achieve the underlying purpose of the regulations. The NRC staff finds that granting the requested exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Thus, an exemption is authorized by 10 CFR 50.12. The underlying purpose of 10 CFR 50.46 and 10 CFR 50 Appendix K is to establish requirements for calculations of emergency core cooling systems. The licensee addressed the safety impact of the demonstration assemblies on emergency core cooling system performance as part of the application for exemption and demonstrated that the new zirconium based cladding does not affect the ECCS calculations. The underlying purpose of 10 CFR 50.44 is to ensure that means are provided for the control of hydrogen gas that may be generated following a postulated loss-of-coolant accident. The licensee previously addressed hydrogen generation following a loss-of-coolant accident. The licensee's proposed action has no significant effect on the previous assessment of hydrogen gas production.

Environmental Impacts of the Proposed Action:

With regard to potential radiological impacts to the general public, the proposed exemption involves features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect the potential for radiological accidents and does not affect radiological plant effluents. The demonstration assemblies meet the same design bases as the fuel which is currently in the reactor. No safety limits have been changed or setpoints altered as a result of the use of these assemblies. The Final Safety Analysis Report (FSAR) analyses are bounding for the demonstration assemblies as well as the remainder of the core. The advanced zirconium-based alloys have been shown through testing to perform satisfactorily under conditions representative of a reactor environment. In addition, the relatively small number of fuel rods involved does not represent a prohibitively large inventory of radioactive material which could be released into the reactor coolant in the event of cladding failure. The only credible consequence of this change would be a failure of the demonstration claddings. Even in the case of gross fuel failure, the number of rods involved is less than 1% of the core and, thus, sufficiently small that environmental impact would be negligible and is bounded by previous assessments. The small number of fuel rods involved in conjunction with the chemical similarity of the demonstration cladding to zircaloy cladding ensures that hydrogen production would not be significantly different from previous assessments. As a result, the proposed exemption does not affect the consequences of radiological accidents. Consequently, the Commission concludes that there are no significant radiological impacts associated with the proposed exemption.

With regard to the potential environmental impacts associated with the

transportation of the demonstration assemblies, the advanced claddings have no impact on previous assessments determined in accordance with 10 CFR 51.52. With regard to potential nonradiological impacts, the proposed exemption does not affect nonradiological plant effluents and has no other environmental impact. Therefore, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed exemption.

Alternatives to the Proposed Action:

Because the Commission's staff has concluded that there is no significant environmental impact associated with the proposed exemption, any alternative to the proposed exemption will have either no significantly different environmental impact or greater environmental impact.

The principal alternative would be to deny the requested exemption. This would not reduce environmental impacts as a result of plant operations.

Alternative Use of Resources:

This action does not involve the use of resources not previously considered in connection with the Final Environmental Statement related to the operation of Three Mile Island Nuclear Station, Units 1 and 2, issued by the Commission in December 1972.

Agencies and Persons Consulted:

In accordance with its stated policy, the NRC staff consulted with Richard Janati of the Pennsylvania Department of Environmental Resources on June 9, 1995, regarding the environmental impact of the proposed action. Mr. Janati had no comments on behalf of the Commonwealth of Pennsylvania.

FINDING OF NO SIGNIFICANT IMPACT

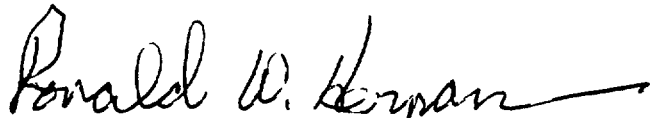
Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed exemption.

Based upon the foregoing environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for exemption dated June 1, 1995, which is available for public inspection at the Commission's Public Document Room, 2120 L Street, NW., Washington, DC 20555 and at the local public document room located at the Law/Government Publications Section, State Library of Pennsylvania, (REGIONAL DEPOSITORY) Walnut Street and Commonwealth Avenue, Box 1601, Harrisburg, PA 17105

Dated at Rockville, Maryland this 26th day of June, 1995

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, reading "Ronald W. Hernan", with a long horizontal flourish extending to the right.

Ronald W. Hernan, Acting Director
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation