

March 15, 1994

Docket No. 50-289

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

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RHernan

Dear Mr. Broughton:

SUBJECT: ISSUANCE OF AMENDMENT - TSCR NO. 232 (TAC NO. M88062)

The Commission has issued the enclosed Amendment No. 183 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit No. 1, in response to your letter dated August 26, 1993.

The amendment revises the TMI-1 Technical Specifications (TSs) to accommodate fuel reconstitution based on NRC Generic Letter (GL) 90-02, Supplement 1, and NRC-approved generic Babcock & Wilcox Fuel Company (BWFC) Topical Report BAW-2149, "Evaluation of Replacement Rods in BWFC Fuel Assemblies." Allowing this limited substitution for fuel rods in fuel assemblies that are found to be leaking during outage or are possible sources of future leakage may result in reductions in future occupational radiation exposure and plant radiological releases.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

Ronald W. Hernan, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 183 to DPR-50
- 2. Safety Evaluation

cc w/enclosures:
See next page

OFFICE	LA:PDI-4	PDI-4	PM:PDI-4	D:PDI-4	OGC
NAME	SNorris	CChung:bf	RHernan	JStolz	JGorgensen
DATE	12/17/93	12/20/93	12/20/93	12/21/93	3/8/94

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 15, 1994

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Sincerely,

A handwritten signature in black ink that reads "Ronald W. Hernan".

Ronald W. Hernan, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 183 to DPR-50
2. Safety Evaluation

cc w/enclosures:
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 COMMISSION
WASHINGTON, D.C. 20555-0001

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER & LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

GPU NUCLEAR CORPORATION

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 183
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by GPU Nuclear Corporation, et al. (the licensee), dated August 26, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.c.(2) of Facility Operating License No. DPR-50 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 183, are hereby incorporated in the license. GPU Nuclear Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance, to be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stolz, Director
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 15, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 183

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove

5-4
5-5

Insert

5-4
5-5

5.3 REACTOR

Applicability

Applies to the design features of the reactor core and reactor coolant system.

Objective

To define the significant design features of the reactor core and reactor coolant system.

Specification

5.3.1 REACTOR CORE

5.3.1.1 A fuel assembly normally contains 208 fuel rods arranged in a 15 by 15 lattice. The reactor shall contain 177 fuel assemblies. Each assembly shall consist of a matrix of zircaloy or ZIRLO fuel rods with an initial composition of natural or slightly enriched uranium dioxide as fuel material. Limited substitutions of zirconium alloy or stainless steel filler rods for fuel rods, in accordance with NRC-approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff-approved codes and methods, and shown by tests or analyses to comply with all fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in non-limiting core regions. The details of the fuel assembly design are described in TMI-1 UFSAR Chapter 3.

5.3.1.2 The reactor core shall approximate a right circular cylinder with an equivalent diameter of 128.9 inches. The active fuel height is defined in TMI-1 UFSAR Chapter 3.

5.3.1.3 The core average and individual batch enrichments for the present cycle are described in TMI-1 UFSAR Chapter 3.

5.3.1.4 The control rod assemblies (CRA) and axial power shaping rod assemblies (APSRA) are distributed in the reactor core as shown in TMI-1 FSAR Chapter 3. The CRA and APSRA design data are also described in the UFSAR.

5.3.1.5 The TMI-1 core may contain burnable poison rod assemblies (BPRA) and gadolinia-urania integral burnable poison fuel pellets as described in TMI-1 UFSAR Chapter 3.

5.3.1.6 Reload fuel assemblies and rods shall conform to design and evaluation data described in the UFSAR. Enrichment shall not exceed a nominal 5.0 weight percent of U^{235} .

5.3.2 REACTOR COOLANT SYSTEM

5.3.2.1 The reactor coolant system shall be designed and constructed in accordance with code requirements. (Refer to UFSAR Chapter 4 for details of design and operation.)

- 5.3.2.2 The reactor coolant system and any connected auxiliary systems exposed to the reactor coolant conditions of temperature and pressure, shall be designed for a pressure of 2,500 psig and a temperature of 650°F. The pressurizer and pressurizer surge line shall be designed for a temperature of 670°F.
- 5.3.2.3 The reactor coolant system volume shall be less than 12,200 cubic feet.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 183 TO FACILITY OPERATING LICENSE NO. DPR-50

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER & LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

1.0 INTRODUCTION

The NRC issued GL 90-02 on January 29, 1990, to implement a line-item improvement to plant Technical Specifications (TSs) by providing alternate requirements for fuel assemblies in the design features section of the TSs. The generic letter states that, on a plant-specific basis, "the staff has approved changes to these requirements that provide flexibility for improved fuel performance by permitting timely removal of fuel rods that are found to be leaking during a refueling outage or are determined to be probable sources of future leakage." The NRC issued Supplement 1 to GL 90-02 on July 31, 1992, to clarify the limitations on the application of NRC-approved analytical methods related to fuel assembly reconstitution. Supplement 1 also withdrew and replaced the model TS recommended in the initial GL 90-02 to be consistent with realistic reconstitution configurations. The model TS change in GL 90-02, Supplement 1, is also reflected in NUREG-1430, Revision 0 (September 1992), which is the Standard TS for plants of the Babcock & Wilcox (B&W) design.

In a separate action, the NRC issued a letter to the B&W Owners Group on April 12, 1993, approving use of B&W Topical Report No. BAW-2149, "Evaluation of Replacement Rods in BWFC Fuel Assemblies," as a basis for fuel assembly reconstitution for reload applications.

The GPU Nuclear Corporation (the licensee) submitted a request on August 26, 1993, for changes to the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1) TSs. The requested changes would revise the TMI-1 TSs to accommodate limited fuel reconstitution based on NRC Generic Letter (GL) 90-02, Supplement 1.

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2.0 EVALUATION

The approval of reconstitution methodology in BAW-2149 is only applicable for those fuel assembly designs which incorporate no more than ten solid type 304 stainless steel replacement rods. The licensee's request states that the TS changes would provide flexibility for improved fuel performance by permitting timely removal of fuel rods found to be leaking during a refueling outage or determined to be possible source of future leakage. The improvement in fuel performance program would provide for reductions in future occupational radiation exposure and plant radiological releases. The proposed changes also add a provision for the use of a limited number of lead test assemblies in non-limiting core regions.

The proposed change to TMI-1 TS 5.3.1.1 (Page 5-4) is a line-item TS change and is essentially consistent with the guidance contained in NRC GL 90-02, Supplement 1 (with one minor exception discussed below), and with NUREG-1430, Revision 0. In a telephone call on December 17, 1993, the licensee agreed to clarify its request by replacing the words "zirconium alloy" with the words "zircaloy and ZIRLO." This clarification is within the scope of the action noticed in the Federal Register on November 10, 1993, and does not alter the staff's initial determination of no significant hazards determination. Therefore, the wording of the TS change approved by this amendment would be slightly different than that requested by the licensee.

As noted in the licensee's submittal, the use of material other than type 304 stainless steel, zircaloy or ZIRLO for fuel assembly reconstitution would require a formal exemption from NRC regulations. Specifically, 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light water nuclear power reactors," specifies "zircaloy or ZIRLO" cladding material in the core. ZIRLO is the trade name for a specific zirconium alloy and was incorporated into the NRC's regulations on August 31, 1992. The licensee's amendment request used the words "zirconium alloy" to describe the cladding material. The NRC staff's position is that the TS design description in Section 5.3.1.1 should also state "zircaloy or ZIRLO" instead of "zirconium alloy" to be consistent with 10 CFR 50.46. The licensee agreed to this minor change during a telephone call on December 17, 1993.

The reconstitution methodology in BAW-2149 has been found acceptable by the NRC in that it satisfies the generic fuel design criteria described in Section 4.2 of the Standard Review Plan. Fuel assemblies are limited to those fuel designs that have been analyzed with applicable NRC-approved codes and methods, and shown by tests or analyses to comply with all fuel safety design bases. Neutronic, thermal-hydraulic, and mechanical analyses, demonstrating that the inclusion of filler rods in fuel assemblies with the actual configurations and core locations chosen for specific reload fuel cycle is acceptable with respect to overall fuel performance and safety considerations. The staff approved the methodology used in BAW-2149 for this purpose using only solid Type 304 stainless steel replacement rods and no more than 10 such rods per fuel assembly. As discussed above, the methodology for fuel reconstitution using other than Type 304 stainless steel, zircaloy or ZIRLO would also require an exemption from the regulations. The latest generation

of fuel assemblies used at TMI-1 are specifically designed to allow fuel reconstitution.

With the one minor change discussed above incorporated into the proposed TS revision, the staff finds that the licensee's request complies with the guidance provided in GL 90-02, Supplement 1. On that basis, we conclude that the proposed changes to TMI-1 TS 5.3.1.1 are acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts or types of effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 59751). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: C. Chung

Date: March 15, 1994