September 11, 199

Docket No. 50-289

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Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
Post Office Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

SUBJECT: THREE MILE ISLAND, UNIT 1 - RELIEF FROM SECTION XI ASME CODE REQUIREMENTS (TAC NO. 80197)

By letter dated April 19, 1991, GPU Nuclear Corporation requested relief from the ASME Boiler and Pressure Vessel Code, Section XI, requirements that have been determined to be impractical at Three Mile Island, Unit 1 (TMI-1). The primary purpose of the letter was to submit the Inservice Inspection (ISI) program for the second 10-year period starting April 20, 1991, the second 10-year ISI interval. The April 19 letter also requested relief for certain inspections (hydrostatic tests) deemed impractical during the first 10-year interval.

Based on our review of your April 19 request, we have determined that the relief requested is appropriate. Pursuant to 10 CFR 50.55a(g)(6)(i), we have further determined that granting this relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. In making this determination, we have given due consideration to the burden that could result if the subject inspections were required to be performed. The results of our review are discussed in the enclosed Safety Evaluation.

This relief is granted pursuant to 10 CFR Part 50.55a(g)(6)(i).

Sincerely,

/s/

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

Enclosure:
Safety Evaluation

cc w/enclosure:
See next page

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Mr. T. Gary Broughton
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE FIRST TEN-YEAR INTERVAL INSERVICE INSPECTION

RELIEF REQUEST NOS. 1, 2, 3 AND 4

GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NUMBER 50-289

1.0 INTRODUCTION

Technical Specification 4.2 for Three Mile Island Nuclear Station, Unit 1 (TMI-1), states that the surveillance requirements for inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used if (1) the proposed alternatives would provide an acceptable level of quality or safety, or (2) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first ten-year interval comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) on the date twelve months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for his facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose

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alternative requirements that are determined to be authorized by law, will not endanger life, property or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

In a letter dated April 19, 1991, the Licensee, GPU Nuclear Corporation, submitted Requests for Relief 1, 2, 3 and 4 asking for relief from performing Code required hydrostatic tests for certain sections of piping during the First Ten-Year Interval Inservice Inspection (ISI) Program at TMI-1.

The staff has evaluated the above mentioned relief requests for Three Mile Island, Unit 1 with technical assistance from its Contractor, the Idaho National Engineering Laboratory (INEL).

2.0 EVALUATION

The information provided by the Licensee in support of the requests for relief from certain Section XI requirements has been evaluated and the bases for granting relief from those requirements are documented below. The applicable edition of the ASME Code for the TMI-1 first 10-year inservice inspection interval is the 1974 Edition through Summer 1975 Addenda (74S75).

A. Request for Relief No. 1, Hydrostatic Pressure Testing of Discharge Piping from Class 2 Makeup and Purification System Pumps

Code Requirement: Section XI, paragraph IWC-5220(a) requires that "the system hydrostatic test pressure shall be at least 1.25 times the system design pressure (P_D) and conducted at a test temperature not less than 100 F except as may be required to meet the test temperature requirements of IWA-5230."

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic pressure test of the piping from the discharge flange of pumps MU-P1A/B/C to valves MU-V74A/B/C and MU-V64A/B/C.

Licensee's Basis for Requesting Relief: The Licensee states that it was not possible to test the piping to the Code-required hydrostatic test pressure of 3813 psig from the discharge flange of MU-P1A/B/C to MU-V74A/B/C and MU-V64A/B/C because the pump suction piping is only designed for 505 psig. It is not considered desirable to blank flange the piping at the discharge of MU-P1A/B/C due to ALARA, and concerns regarding potential damage and leakage upon restoration.

The Licensee notes that the 74S75 Code does not contain a test boundary statement. GPU Nuclear (GPUN) proposes to adopt the requirements of Subparagraph IWA-5224(d) of the 1986 Edition of Section XI which states, "Where the respective system primary pressure ratings on the suction and discharge sides of system pumps differ, the system test boundary shall be divided into two separate boundaries (such as the suction side and discharge side test boundaries). In the case of positive displacement pumps,

the boundary interface shall be considered as the pump. In the case of centrifugal pumps, the boundary interface shall be the first shutoff valve on the discharge side of the pump." MU-P1A/B/C are centrifugal pumps; therefore, relief is requested to use the above test boundary statement.

Licensee's Proposed Alternative Examination: The Licensee proposes to use Subparagraph IWA-5224(d) of the 1986 Edition. The Licensee states that the subject piping was hydrostatically tested to 1.25 times the design pressure of the suction piping for pumps MU-P1A/B/C. The suction piping is designed for 505 psig, therefore, the hydrostatic test pressure was 632 psig.

The Licensee's position is that a VT-2 visual examination during normal pump operation (approximately 3000 psig) is adequate to assure the pressure retaining capability, structural integrity, and leak tightness of this piping.

Staff Evaluation: The system design does not permit hydrostatic testing of the suction piping of the pumps to the Code-required discharge side test pressures. The Code Committee realized the impracticality and revised the Code requirement in a later edition of the Code. If the Code requirement were imposed, the system would have to be redesigned or the pumps would have to be replaced. The Licensee's proposed alternative test, at normal operating pressure of approximately 3000 psig, will provide reasonable assurance of the continued inservice structural integrity. Pursuant to 10 CFR 50.55a(g)(6)(i) and based on the impracticality of complying with the 74S75 Code requirement, the burden on the Licensee if the Code requirement were imposed, and considering the proposed VT-2 visual examination at normal operating pressure, relief is granted as requested.

B. Request for Relief No. 2, Hydrostatic Pressure Testing of Class 2 Piping in the Makeup and Purification System

Code Requirement: Section XI, paragraph IWC-5220(a) requires that "the system hydrostatic test pressure shall be at least 1.25 times the system design pressure (P_D) and conducted at a test temperature not less than 100 F except as may be required to meet the test temperature requirements of IWA-5230."

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the makeup and purification piping section from MU-V64C to MU-V193C.

Licensee's Basis for Requesting Relief: The Licensee states that between valves MU-V64C and MU-V193C there is no vent or instrument tap that will allow connection of the hydrostatic test pump.

Licensee's Proposed Alternative Examination: None. The Licensee states that a system leakage test with makeup and purification pump MU-P1C operating (approximately 3000 psig) has assured that the pressure retaining capability, structural integrity and leaktightness of this piping is maintained.

Staff Evaluation: As shown in ISI Drawing No. 1D-ISI-FD-017, the systems described in Request for Relief No. 1 are redundant. Systems "A" and "B" receive the Code required examination because the piping between MU-V64A/B and MU-V193A/B contains a vent which allows connection of the hydrostatic test pump. System "C" does not have a vent or instrument tap. The system design, therefore, makes the Code-required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, the subject line would require design modifications and installation of a connection for the hydrostatic test pump. The increase in plant safety would not compensate for the burden placed on the Licensee that would result from imposition of the requirement.

Because the "C" system sees the same operating and environmental conditions as the "A" and "B" systems, which receive the Code-required hydrostatic test, a reasonable assurance of the continued structural integrity has been attained. Based on the above, and pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted as requested.

C. Request for Relief No. 3, Hydrostatic Test of Class 3 Piping of the Intermediate Closed Cooling System

Code Requirement: Section XI, Article IWD-5000 requires "the system test pressure shall be at least 1.10 times the system design pressure."

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic pressure test of the Class 3 piping in the Intermediate Closed Cooling System from valves IC-V77A/B/C/D to IC-V78A/B/C/D.

Licensee's Basis for Requesting Relief: The Licensee states that the piping from IC-V77A/B/C/D to IC-V79A/B/C/D is designed for 2500 psig. Therefore, the Class 3 hydrostatic test pressure is 2750 psig. There is no pressure tap between IC-V77A/B/C/D (manual maintenance isolation valve) and IC-V78A/B/C/D (check valve). If IC-V78A/B/C/D experienced no seat leakage or if the isolation valves IC-V77A/B/C/D were to leak during the test, the approximately one foot of pipe between IC-V77A/B/C/D and IC/V78A/B/C/D would not experience the hydrostatic test pressure of 2750 psig. The piping upstream of IC-V77A/B/C/D is only designed for 175 psig; therefore, it is not desirable to supply 2750 psig hydrostatic test pressure upstream of IC-V78A/B/C/D.

The Licensee notes that the Class 3 portion of this system does not meet the Category D-A, D-B, or D-C criteria of the 1986 Edition of Section XI,

which exempts NPS 4-inch and smaller, and therefore the pressure testing requirements of Section XI do not apply for subsequent inspection intervals.

Licensee's Proposed Alternative Examination: The piping between IC-V77A/B/C/D and IC-V78A/B/C/D was hydrostatically tested to 193 psig (the test pressure upstream of IC-V77A/B/C/D).

Staff Evaluation: Positive isolation of the piping upstream of IC-V77A/B/C/D during hydrostatic testing to 2750 psig is not possible. The system design, therefore, makes the Code required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, the subject lines would require design modifications to provide isolability. The increase in plant safety would not compensate for the burden placed on the Licensee that would result from imposition of the requirement.

GPU Nuclear Corporation's proposed alternative to perform the hydrostatic test at 193 psig to verify the structural integrity and leaktightness of this piping will provide reasonable assurance of the continued inservice structural integrity. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted as requested.

D. Request for Relief No. 4, Hydrostatic Test of a Portion of the Class 1 Reactor Coolant System (Auxiliary Pressurizer Spray)

Code Requirement: Section XI, paragraph IWB-5210 requires that the components be subjected to a system hydrostatic pressure test at or near the end of each inspection interval.

Licensee's Code Relief Request: Relief is requested from performing the Code required hydrostatic pressure test on approximately 4 feet of 1-1/2 inch diameter piping between valves RC-V23 and RC-V4.

Licensee's Basis for Requesting Relief: The Licensee states that there is no pressure tap, therefore, no way to connect a hydrostatic test pump to this short section of pipe.

Licensee's Proposed Alternative Examination: None. A VT-2 examination will be performed during the system inservice leak test.

Staff Evaluation: Valve RC-V4 is the Class 1/Class 2 system boundary. RC-V23 is a check valve which allows flow from the Class 2 Decay Heat Spray Line to the Pressurizer. The subject section of pipe cannot be pressurized from the Class 1 side because the check valve prevents flow. It is not desirable to pressurize from the Class 2 side because of the possibility of pressurized thermal shock on the Class 1 pressurizer system. The system design, therefore, makes the Code required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, the subject line would require design

modifications or installation of a pressure tap. The increase in plant safety would not compensate for the burden placed on the Licensee that would result from imposition of the requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted as requested.

3.0 CONCLUSION

Paragraph 10 CFR 50.55a(g)(4) requires that components (including supports) that are classified as ASME Code Class 1, 2, and 3 meet the requirements, except design and access provisions and preservice requirements, set forth in applicable editions of ASME Section XI to the extent practical within the limitations of design, geometry, and materials of construction of the components. Pursuant to 10 CFR 50.55a(g)(5)(iii), the Licensee determined that conformance with certain Code requirements is impractical for his facility and presented requests for relief in a submittal dated April 19, 1991. Pursuant to 10 CFR 50.55a(g)(6)(i), the staff concludes that the requirements of the Code are impractical and relief may be granted as requested. Such relief is authorized by law and will not endanger life, property, or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the Licensee that could result if the requirements were imposed on the facility.

Principal Contributor: T. McLellan

Date: September 11, 1991