



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO RELIEF FROM CERTAIN REQUIREMENTS OF SECTION XI OF THE ASME CODE

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 Technical Specifications for the Three Mile Island Unit 1 (TMI-1) require that inservice examination of ASME Code Class 1, 2 and 3 components shall be performed in accordance with Section XI of the ASME Code as required by 10 CFR 50.55a(g)(4) except where specific written relief has been granted by the Commission. Because some plants were designed in conformance to early editions and addenda of this Code section, certain requirements of later editions and addenda of Section XI are impractical to perform due to the plant's design, component geometry, and material of construction. Consequently, paragraph 10 CFR 50.55a(g)(6)(i) authorizes the Commission to grant relief from those requirements upon making the necessary findings. In addition, 10 CFR 50.55a(g)(4)(iv) allows the Commission to approve the use of later approved Code editions or addenda provided all the related requirements of the respective editions or addenda are met.

In letters dated August 20, 1986 and October 20, 1986, the GPU Nuclear Corporation (GPU or the licensee), identified specific ASME Code requirements that GPU determined to be impractical to perform at TMI-1 and requested relief from these requirements. The NRC staff evaluated the licensee's supporting technical justification and transmitted the staff evaluation in a letter dated March 20, 1987. The staff did not have sufficient information to complete the review of relief request No. 7. In a letter dated August 31, 1987, the licensee provided additional supporting information. The objective of this Safety Evaluation is to complete the staff's review of this issue.

2.0 EVALUATION

The current TMI-1 Inservice Inspection (ISI) Program is based on the ASME Code, Section XI, 1974 Edition including Addenda through Summer 1975. Additionally, GPU has adopted certain portions of ASME Section XI, 1977 Edition, including Addenda through Summer 1978 (specifically, IWA-2200, IWA-2300, and IWA-3000) as described in their letter dated July 6, 1981.

The licensee requested relief from specific ISI requirements and provided supporting technical information. We have reviewed this information as related to the design, geometry, and materials of construction of the components. The relief request is characterized below with a summary of the NRC staff's evaluation.

Relief Request No. 7, Examination Categories C-F and C-G, ASME Code Class 2, Pipe Branch Connection Welds, Item C2.3

Code Requirement: ASME Section XI, 1974 Edition, including Addenda through Summer 1975, requires a volumetric examination of these welds.

Code Relief Request: The licensee requests relief to perform a surface examination of 26 main steam system welds and 4 decay heat removal system welds, all of which are ASME Class 2 non-exempt.

Reason for Request: The subject welds are of the standard weldolet design, or as in the case of some main steam welds, they are weldolet design with an adjacent reinforcing pad as shown in figures provided to the NRC staff. The design of this joint is such that ultrasonic examination from the branch side of the connection cannot be performed due to lack of space required to apply the transducer and due to a constantly changing contour.

Ultrasonic examination from the outside surface of the main pipe run would not be in the correct direction to detect service induced inside diameter flaws and would be less sensitive to outside diameter flaws than surface examination techniques. Also, in the case of welds with reinforcing pads, sound would be prevented from penetrating the required volume.

Radiographic examination of these welds is best performed with access to the inside of the piping. But in this case, without access, less than optimum examination results would be obtained. Surface examination only of these welds meets later editions of the Section XI Code (Summer 1978 and later) and Code Case N-408. Therefore, the licensee believes that the alternative examination is justified and meets the intent of the ASME Code.

STAFF EVALUATION

The licensee identified the 30 branch connections in the decay heat and main steam systems that are the subject of this request. Sixteen of the branch lines contain a welded reinforcement pad that completely covers the pressure retaining nozzle weld. The reinforcement saddles include vent holes to detect degradation of the pressure retaining boundary. The staff finds that the design configuration of the reinforcement pad makes volumetric examination impractical.

The other branch lines range from 6" to 18" in diameter. The licensee provided a figure showing a typical weldolet design. Based on this information the staff determined that ultrasonic examination would be difficult and that optimum results for the detection flaws originating from inside diameter would not be obtained because of the constantly changing welded contour and the limited scanning surface on the fitting side.

Paragraph 10 CFR 50.55a(g)(4)(iv) states "Inservice examination of components, tests of pumps and valves and system pressure tests may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of this section subject to the limitations and modifications listed in paragraph (b) of this section, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met."

The licensee intends to use provisions from a later approved ASME Code edition and addenda. Even though the extent and/or method of examinations have been reduced, other licensees with ISI programs based on the later ASME Code documents are following these requirements pursuant to 10 CFR 50.55a(g)(4). The staff has reviewed the licensee's request and has determined that the licensee proposes to use all related requirements of the later approved Code edition and addenda.

3.0 CONCLUSION

The staff has reviewed the licensee's letters dated August 20, 1986, October 20, 1986 and August 31, 1987 based on provisions of 10 CFR 50.55a(g)(4)(iv) and determined that proposed surface examination meets a later approved Code edition and addenda and is acceptable.

Dated: March 25, 1988

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