

## **GPU Nuclear Corporation**

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December 13, 1993 C311-93-2163 5000-93-0071

U. S. Nuclear Regulatory Commission Attention: Document Control Desk Washington, DC 20555

Gentlemen:

Subject: Three Mile Island Nuclear Station, Unit 1 (TMI-1) Operating License No. DPR-50 Docket No. 50-289 GPU Nuclear Response to RAI Regarding Generic Letter (GL) 92-01 Revision 1 (TAC No. M83741), "Reactor Vessel Structural Integrity"

On July 19, 1993, NRC issued a request for additional information (RAI) for GPU Nuclear Corporation (GPU Nuclear) response to GL 92-01 in order to complete its assessment of compliance with the requirements set forth in Appendices G and H to 10 CFR Part 50 regarding reactor vessel structural integrity.

The RAI requested responses to the following three (3) items:

1 - GL 92-01 Question 2a (Cv-USE for Welds):

Confirmation that the B&W Owners Group (B&WOG) reports on USE equivalent margin analysis regarding beltline welds with low USE values for service levels A&B and for service levels C&D will be used as the licensing bases to demonstrate that all of the TMI-1 beltline welds will meet the USE requirements of Appendix G, 10 CFR 50.

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2 - GL 92-01 Question 2a (CV-USE for Plate):

Provide information to demonstrate that all beltline <u>plates</u> will meet the USE requirements of Appendix G, 10 CFR 50.

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3 - GL 92-01 Question 2b (Initial RT , for Welds):

Provide justification for not using the generic mean IRT value of 0  $^\circ$ F suggested by 10 CFR 50.61 for the initial RT<sub>ndt</sub> value for the TMI-1 weld metals.

The GPU Nuclear responses to these questions are as follows:

1 - GL 92-01 Question 2a (Cv-USE for Welds):

The B&WOG has submitted three (3) reports which are applicable to the TMI-1 vessel and which evaluate the integrity of the vessel for welds which have low upper shelf toughness. GPU Nuclear confirms that these reports are to be used as the licensing bases to demonstrate that all of the beltline welds will meet the USE requirements of Appendix G, 10 CFR 50. The reports are:

a) <u>BAW-2148 Rev. 1 "Low Upper-Shelf Toughness Fracture Analysis</u> of Reactor Vessels of Zion Units 1 & 2 for Load Level A & B Conditions."

This report was issued as a lead plant analysis for the low upper shelf issue.

b) <u>BAW-2192 Rev. 0 "Low Upper-Shelf Toughness Fracture Analysis</u> of Reactor Vessels of B&W Owners Group Reactor Vessel Working Group for Load Level A & B Conditions."

This report was issued to demonstrate and document that the results of BAW-2148 Rev. 1 bound all of the B&WOG Reactor Vessel Working Group vessels, including the TMI-1 vessel.

Recently, an error was noted in the content of this report which affects the TMI-1 vessel evaluation but does not change the conclusion regarding the results being bounding for TMI-1. The error is in the use of the WF-8 weld instead of the SA-1526 weld as the limiting longitudinal weld. The lower bound  $J_{0,1}$  value for the longitudinal weld, in Table No. 5-2 decreases from 673 lb/in to 558 lb/in, and in Table No. 5-3, the respective margin values decrease from 1.42 and 1.23 to 1.18 and 1.02. A revision of this report will be issued shortly by the B&WOG. C311-93-2163 Page 3

> c) <u>BAW-2178 Rev. 0 "Low Upper-Shelf Toughness Fracture</u> <u>Mechanics Analysis of Reactor Vessels of B&W Owners Reactor</u> <u>Vessel Working Group for Level C & D Service Loads."</u>

This report provides an evaluation of the vessel integrity during bounding B&WOG NSSS systems service level C & D transient and design basis event conditions.

## 2 - GL 92-01 Question 2a (Cv-USE for Plate):

The B&WOG submittal in response to GL 92-01 provides an appropriate value for the initial Cv-USE of the plate materials and refers to BAW-10046 Rev 3. This initial Cv-USE value was obtained from five (5) different plates which have been used in the fabrication of the B&WOG vessels. The individual initial Cv-USE values are contained in BAW-10046 as well as in BAW-1820 ("B&WOG 177-FA Reactor Vessel and Surveil ance Program Materials Information") report, dated December 1984, which had been submitted to the NRC and which may contain the requested information in a more concise form.

The TMI-1 vessel beltline plates are made of SA-302 Gr. B, modified by ASME Code Case 1339. One of the capsules reported in BAW-1820 (dated December 1984), submitted by B&WOG, is the TMI-1 surveillance capsule for an upper shell plate designated as C-2789-2. The initial CV-USE for that plate is 98 ft-lbs in the transverse direction. The copper content in that plate is 0.09 wt%. Two irradiated capsules have already been evaluated and reported in the TMI-1 capsule report (BAW-1901) which was submitted by GPU Nuclear letter dated May 5, 1986.

The B&WOG submittal also appropriately stated that the Cv-USE for the plate materials will not fall below 50 ft-lbs before 32 EFPY is achieved.

## 3 - GL 92-01 Question 2b (Initial RT dt for Welds):

In response to this item we refer you to the recent GPU Nuclear Technical Specification Change Request (TSCR-207) for the TMI-1 Operating P/T Limits which provides ample discussion regarding appropriate unirradiated RT values which should be utilized for evaluating the limiting TMI-I reactor vessel weld metals. C311-93-2163 Page 4

GPU Nuclear believes that adequate demonstration has been provided regarding compliance with the applicable requirements to assure the integrity of the TMI-1 reactor vessel. We trust that this response provides all of the additional information which has been requested.

If you have any questions concerning the information provided, please contact Mr. Michael Laggart, Manager, Corporate Nuclear Licensing at (201) 316-7968.

Sincerely,

Sector

R. W. Keaten Vice President and Director, Technical Functions

cc: Administrator, Region I TMI-1 Senior Project Manager TMI-1 Senior Resident Inspector