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10 CFR 50.55a

July 6, 2001
5928-01-20197

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

SUBJECT: THREE MILE ISLAND, UNIT 1
FACILITY OPERATING LICENSE NO. DPR-50
NRC DOCKET NO. 50-289
SUBMITTAL OF RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION CONCERNING THE IMPLEMENTATION OF THE PERFORMANCE DEMONSTRATION METHODS

References:
1) Letter from J. J. Hagan (PECO Energy Company, AmerGen Energy Company, LLC) to NRC, dated December 21, 2000

2) Letter from J. J. Hagan (Exelon Generation Company, LLC and AmerGen Energy Company, LLC) to NRC, dated February 20, 2001

3) Letter from T. G. Colburn (NRC) to M. E. Warner (AmerGen Energy Company, LLC) to NRC, dated June 7, 2001

Dear Sir/Madam:

In the Reference 1 and 2 letters, pursuant to 10 CFR 50.55a(a)(3)(i), and 10 CFR 50.55a(g)(6)(i), AmerGen Energy Company, LLC (Licensee under Facility Operating License No. DPR-50 for Three Mile Island, Unit 1) requested approval of proposed alternatives and a proposed relief request. These proposed alternatives and relief request concern performance demonstration methods for ultrasonic examination systems. In the Reference 3 letter, NRC requested additional information concerning Relief Request VIII-3. Attached is our response to that request.

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If you have any questions, please contact us.

Very truly yours,

James A. Hutton
Director - Licensing
Mid-Atlantic Regional Operating Group

Enclosures

cc: H. J. Miller, USNRC, Administrator, Region I
J. D. Orr, USNRC, Senior Resident Inspector, TMI Unit 1
T. G. Colburn, USNRC, Senior Project Manager, TMI Unit 1
File No. 01002

ENCLOSURE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION CONCERNING RELEF REQUEST VIII-3, WELDS EXAMINED FROM THE INSIDE SURFACE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
RELIEF REQUEST VIII-3
WELDS EXAMINED FROM THE INSIDE SURFACE

Question 1:

What is the end date of the current ISI interval at TMI-1? Are the requested reliefs being requested for both the second and third 10-year interval?

Response:

This relief request has been revised (attached) to state that the relief is being requested for both the second and the third ISI intervals at TMI-1. Although the second interval concluded April 19, 2001, as allowed by ASME Section XI IWA-2430, TMI is has taken an extension to the time necessary to perform the second interval exams for welds CF-0001, CF-0020, RC-0001, RC-0052, RC-0087, and RC-0106. Examinations performed in the second interval are performed in accordance with the requirements of the ASME Section XI Code, 1986 Edition. RC-0033 and RC-0054 are being examined to the requirements of the ASME Section XI Code, 1995 Edition, with 1996 Addenda, which is the applicable code for the third interval.

Question 2:

In the licensees submittal, the following welds are identified:

Core Flood System Pipe-to-Safe-end welds
(Examination Category B-J?, Item Number B9.11?)
CF-0001
CF-0020

Reactor Coolant System Nozzle-to-Pipe welds
(What examination Category? Item Number?)
RC-0001
RC-0033
RC-0052
RC-0054
RC-0087
RC-0106

Provide a list for the welds involved in this relief request. Include weld ID (inside diameter), configuration base materials (steel, stainless steel, or dissimilar materials), weld materials, and weld anomalies. Weld anomalies are anything that would mask the indications being inspected and could be on either the ID or OD (outside diameter) of the

weld. Also, identify the ISI requirement in Table IWB-2500-1, Examination Category and item number, for these welds. List applicable current interval relief requests, if any, for the specified welds. Please provide the date when approved. Please also provide representative drawings.

Response:

Welds CF-0001, CF-0020, RC-0001, RC-0033, RC-0052, RC-0054, RC-0087, and RC-0106 are all Category B-J Item Number B9.11, Class 1, similar metal piping welds. The following table provides a listing of information requested for each weld involved in this relief request:

Weld ID	Configuration	Materials	Anomalies	ISI Requirement And Figures	ISI Interval	Pipe ID
CF-0001	Pipe to Safe-end	Wrought austenitic stainless to austenitic stainless	ID Counterbore	1986 Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Second	11.50"
CF-0020	Pipe to Safe-End	Wrought austenitic stainless to austenitic stainless	ID Counterbore	1986 Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Second	11.50"
RC-0001	Nozzle to Pipe	Wrought carbon to carbon with austenitic stainless ID clad	None	1986 Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Second	36.00" from clad surface
RC-0033	Pipe to Nozzle	Wrought carbon to carbon with austenitic stainless ID clad	None	1995 w/96 Add. Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Third	28.00" from clad surface
RC-0052	Pipe to Nozzle	Wrought carbon to carbon with austenitic stainless ID clad	None	1986 Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Second	28.00" from clad surface
RC-0054	Nozzle to Pipe	Wrought carbon to carbon with austenitic stainless ID clad	None	1995 w/96 Add. Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Third	36.00" from clad surface
RC-0087	Pipe to Nozzle	Wrought carbon to carbon with austenitic stainless ID clad	None	1986 Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Second	28.00" from clad surface
RC-0106	Pipe to Nozzle	Wrought carbon to carbon with austenitic stainless ID clad	None	1986 Section XI Fig. IWB-2500-8(c) (See attached Figure 1 for weld details)	Second	28.00" from clad surface

In a U. S. Nuclear Regulatory Commission Safety Evaluation Report dated October 8, 1992, a relief request was granted from the requirements of ASME Section XI, 1986

Edition, Table IWB-2500-1. This relief request permits the examination of the above identified welds from the inside surface utilizing automated tooling. This relief allows full volumetric examination of these welds using automated ultrasonic examination tooling from the inside surface in lieu of the code required outer diameter surface examination.

Question 3:

For the specified welds, have they been UT (ultrasonic testing) examined from the ID in previous inspection intervals? How successful were these examinations?

Response:

The following are the results of the previous inspections:

Weld ID	Previously examined from the ID with UT	Comments
CF-0001	No	Not examined (1)
CF-0020	No	Not examined (2)
RC-0001	Yes	Successful
RC-0033	Yes	Successful
RC-0052	Yes	Successful
RC-0054	Yes	Successful
RC-0087	Yes	Successful
RC-0106	Yes	Successful

(1) During the 1991 reactor vessel examination, remnants from an initially installed flow venturi prevented the tooling from scanning the required weld volume. The examination was aborted (no Section XI credit was used) and a weld outside the primary shield wall was chosen for examination as allowed by ASME Section XI and 10CFR50.55a (b)(2)(ii). It is expected that the tooling to be used during the 2001 examination will not be effected by these remnants, however, if similar difficulties are encountered the examination will be aborted and an alternate weld will be chosen for examination as allowed by ASME Section XI and 10CFR50.55a(b)(2)(ii).

(2) During the 1991 reactor vessel examination, remnants from an initially installed flow venturi prevented the tooling from scanning the required weld volume on a similar weld in the same system (CF-0001). The examination on that weld was aborted and a weld outside the primary shield wall was chosen for examination as allowed by ASME Section XI and 10CFR50.55a (b)(2)(ii). It is expected that the tooling to be used during the 2001 examination will not be effected by these remnants, however, if similar difficulties are encountered the examination will be aborted and an alternate weld will be chosen for examination as allowed by ASME Section XI and 10CFR50.55a (b)(2)(ii).

Question 4:

A case must be made that the UT technique that will be used is the same (similar) technique that was used for previous examinations or was shown to provide the same results. Identify when the previous examinations occurred (refueling outage #). Reference the paragraphs in the ASME Code or state the differences from the ASME Code in a discussion of the technique that was and/or will be used (i.e., scanning angles, scan directions, calibration, coverage, and demonstrations, if any).

Response:

The Reactor Coolant welds will be examined from the inner diameter utilizing techniques similar to those used during the past examination. The Core Flood welds will be examined using similar techniques as the Reactor Coolant welds. This is the first examination for the Core Flood welds since the preservice examination and this examination will serve as a new baseline. Current plans are to perform the ultrasonic examinations with Framatome's URSULA manipulator and Core Flood Nozzle Examination tool. This equipment has been successfully used at other sites to perform these examinations.

Previous examination of the Reactor Coolant welds was performed during refueling outage 9R, in the Fall of 1991, with Framatome's ARIS manipulator. The data acquisition system and the search unit package (various angles and modes) remain essentially unchanged for these welds.

The core flood welds have not received an ASME Section XI examination since the preservice examination prior to initial plant operation. However, the planned examination techniques have been demonstrated on BWOG core flood mockups containing cracks in both the axial and circumferential orientations. Because these welds have not been examined since the early 1970's the Outage 1R14 examination would essentially establish a new baseline because examination techniques and personnel qualification requirements have vastly improved since the era when the original baseline was performed. As stated previously, during the 1991 reactor vessel examination, remnants from an initially installed flow venturi prevented the tooling from scanning the required weld volume on the Core Flood welds. It is expected that the tooling to be used during the 2001 examination will not be effected by these remnants, however, if similar difficulties are encountered the examination will be aborted and an alternate weld will be chosen for examination as allowed by ASME Section XI and 10CFR50.55a(b)(2)(ii).

The 1991 examination of the reactor coolant pipe welds used 45 degree shear wave and 70 degree L-wave transducers in four beam directions (two axial directions and two circumferential directions). Similar examination and calibration techniques are planned for use again during the upcoming examination. Current plans are to examine the austenitic welds with 45 degree, 55 degree and 70 degree L-wave transducers, and to scan the welds from four beam directions (two axial directions and two circumferential

directions). The examination volume for these welds will include the weld and adjacent base material for ½" on each side of the weld through the entire wall thickness (See Figure 1).

Question 5:

Describe the full volume examination listed as the alternative examination for this relief request. Use diagrams. Explain how you plan to utilize Supplements 4 and 6 of Appendix VIII of Section XI of the ASME Code as stated in the alternative examination.

Response:

A full volume ultrasonic examination will be performed using Framatome's URSULA reactor vessel ultrasonic examination manipulator in conjunction with the ACCUSONEX data acquisition and analysis system. The techniques employed will require the manipulator to reach into each applicable nozzle and deliver the search unit package to the inside diameter of the subject piping welds. A diagram of the defined volume of interest is included in Figure 1.

The search unit package for the core flood welds contains 45, 55, and 70 degree longitudinal search units. The search unit package for examination of the reactor coolant welds will contain 45 degree shear wave and 70 degree longitudinal wave search units.

As stated in our relief request, the personnel evaluating the examination data for the subject welds will be qualified to the requirements of Appendix VIII Supplements 4 and 6 for the reactor vessel examinations. Although Supplements 4 and 6 concern different welds than in Supplements 2 and 3, using examiners that are qualified to Supplements 4 and 6 provides additional confidence in the qualifications of the individuals that will be performing the examinations of the subject welds from the inside surface.

RELIEF NUMBER VIII-3
WELDS EXAMINED FROM THE INSIDE SURFACE
REVISION 0
Three Mile Island, Unit 1

COMPONENT IDENTIFICATION

Code Class:	Class 1
Reference:	ASME, Section XI, Table IWB-2500-1 (1986 Edition), for welds CF-0001, CF-0020, RC-0001, RC-0052, RC-0087, and RC-0106. and ASME Section XI, Table IWB-2500-1 (1995 Edition, with 1996 Addenda) for welds RC-0033 and RC-0054
Examination Categories:	B-J
Item Numbers:	B9.11
Description:	Alternate requirements to Appendix I of Section XI (1995 and 1996 Addenda), "Ultrasonic Examination," concerning examination of welds from the inside surface.
Component:	Core Flood system pipe-to-safe-end welds CF-0001 and CF-0020, and Reactor Coolant system nozzle-to-pipe welds RC-0001, RC-0033, RC-0052, RC-0054, RC-0087, and RC-0106

CODE REQUIREMENTS

10 CFR 50.55a(g)(6)(ii)(C) mandates that Supplements 2 and 3 to Appendix VIII of ASME Section XI (1995 Edition with 1996 Addenda) are required to be implemented by May 22, 2000.

ASME Code, Section XI (1995 Edition with 1996 Addenda), Appendix I, requires that welds in piping be examined using personnel, procedures and equipment qualified to the requirements of Appendix VIII, Supplements 2 and 3.

RELIEF REQUESTED

10 CFR 50.55a mandates the implementation of PDI via the 1995 Edition, with 1996 Addenda of ASME Section XI, Appendix VIII, Supplements 2 and 3. This document requests relief from the qualification requirements mandated in Supplements 2 and 3.

Approval of relief from currently impractical requirements of the ASME Code is requested in accordance with the provisions of 10 CFR 50.55a(g)(6)(i).

BASIS FOR RELIEF

Presently, the approved qualifications to the PDI program only address weld examinations performed from the outside surface. The subject welds are located inside the primary shield wall surrounding the Reactor Vessel. Access into this area would require removal of sand plugs, scaffold erection, insulation removal, and weld surface preparation prior to performing the outside surface examinations. The dose estimate to perform the above mentioned tasks, including performing the examinations, is approximately 87 person-rem. The expected high radiation dose and cost associated with performing the outside surface examinations are not commensurate with an increase in safety.

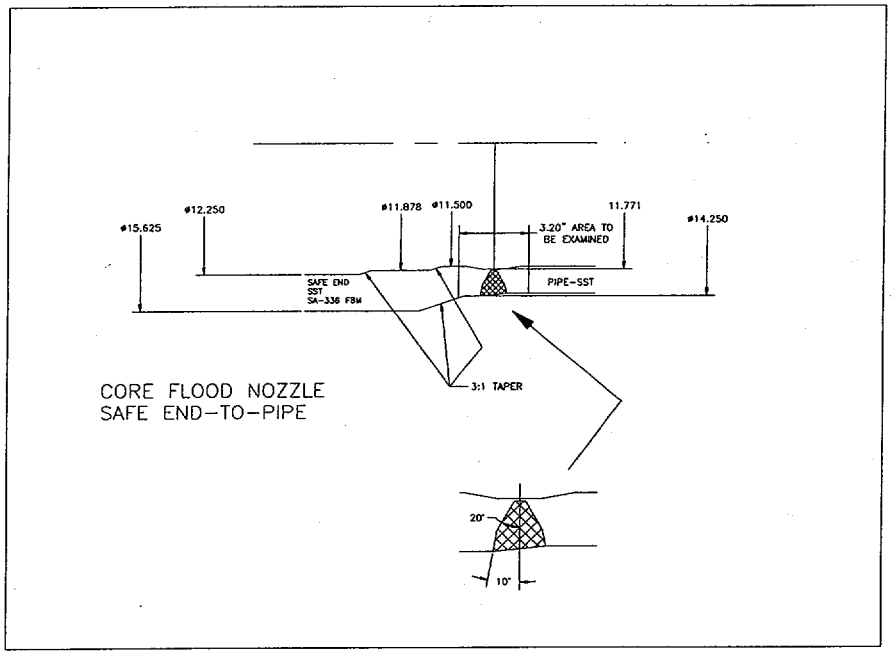
ALTERNATIVE EXAMINATIONS

Perform a full volume (the weld and adjacent base material for ½" on each side of the weld from the ID surface to the OD surface) during the currently scheduled September 2001 outage using an automated ultrasonic examination system. The personnel evaluating the examination data for these piping welds will be qualified to evaluate automated examination data in accordance with Appendix VIII, Supplements 4 and 6, of ASME Section XI (1995 Edition with 1996 Addenda).

APPLICABLE TIME PERIOD

Relief is requested for the examinations currently scheduled for the Fall 2001 outage at Three Mile Island, Unit 1.

FIGURE 1
WELD DETAILS



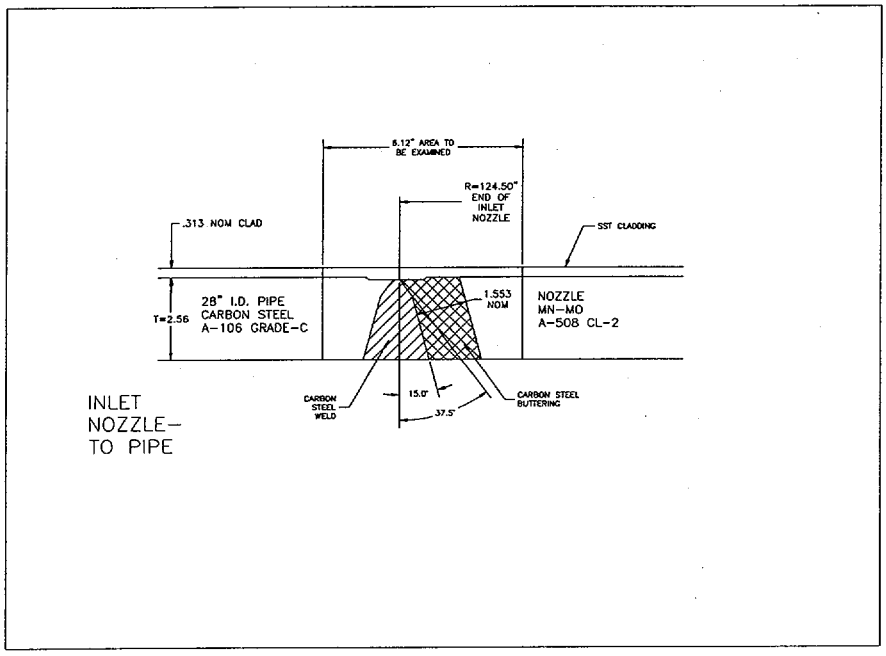
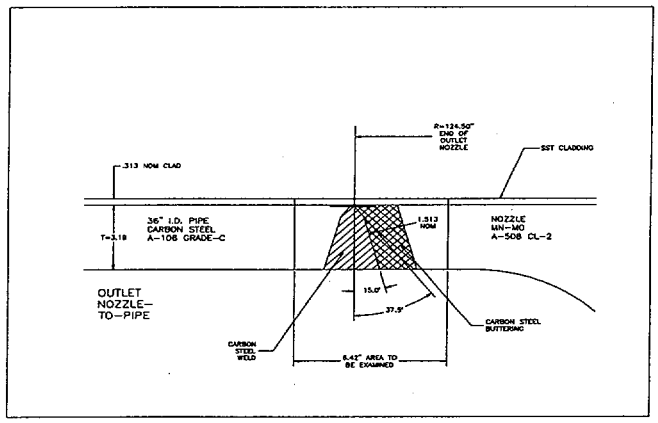



FIGURE 1
WELD DETAILS