

July 31, 2007

MEMORANDUM TO: Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Peter Bamford, Project Manager */ra/*
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: THREE MILE ISLAND UNIT NO. 1 - ELECTRONIC TRANSMISSION,
DRAFT REQUEST FOR ADDITIONAL INFORMATION REGARDING
RELIEF REQUEST NO. 2007-TMI-1, STRUCTURAL WELD OVERLAYS
OF DISSIMILAR METAL WELDS (TAC NO. MD5427)

The attached draft request for additional information (RAI) was transmitted by electronic transmission on July 30, 2007, to Mr. Thomas Loomis, at AmerGen Energy Company, LLC (AmerGen). This draft RAI was transmitted to facilitate the technical review being conducted by the Nuclear Regulatory Commission (NRC) staff and to support a conference call with AmerGen in order to clarify certain items in the licensee's submittal. The draft RAI is related to AmerGen's submittal dated May 1, 2007, regarding Three Mile Island, Unit 1, planned and contingency repairs for various dissimilar metal welds in the reactor coolant system pressure boundary. The draft questions were sent to ensure that the questions were understandable, the regulatory basis for the questions was clear, and to determine if the information was previously docketed. Additionally, review of the draft RAI would allow AmerGen to determine and agree upon a schedule to respond to the RAI. This memorandum and the attachment do not represent an NRC staff position.

Docket No. 50-289

Enclosure: As stated

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REQUEST FOR ADDITIONAL INFORMATION
RELIEF REQUEST NO. 2007-TMI-01
AMERGEN ENERGY CO. LLC
THREE MILE ISLAND, UNIT 1

- 1) On page 4 of 23 of the licensee's submittal, the licensee states that a liquid penetrant (PT) examination will be performed of the overlay area with an acceptance criteria that no indications greater than 1/16" is permitted. When will the PT examination be performed? Is it prior to the overlay and then again after the overlay? Please explain. Which welds will be subject to PT examinations and at what steps in the overlay process? Identify and discuss which welds will receive ultrasonic examination. Indicate when the identified welds will receive ultrasonic examination (i.e. before and/or after the overlay is installed).
- 2) Please discuss why the evaluation to determine if additional exams will be conducted if an unacceptable service induced flaw in weld DH-498 as identified at the bottom of page 4 of 23 would be limited to the elements in the same segment. Please clarify if additional segments will be included in the evaluation if they are subject to the same root cause conditions. Describe what examinations will be performed on weld DH-498 prior to SWOL.
- 3) The licensee states that flaw evaluations in accordance with Code Case N-504-2(g)(2) and shrinkage stress effects analyses in accordance with Code Case N-504-2(g)(3) will be addressed through the approved overlay designs that are currently in development. These documents will be completed and approved for use prior to application at TMI, Unit 1.
 - a) Discuss what is meant by the approved overlay designs that are currently in development. How were the overlay designs approved?
 - b) Will the subject documents be submitted for NRC approval prior to application at TMI, Unit 1? How will the documents be approved for use?
- 4) The licensee states that "Prior to installation of the SWOL, TMI Unit 1 will complete a bare metal visual examination of the PZR surge and decay heat drop line nozzles immediately after the insulation is removed in the area around the nozzle and dissimilar metal weld are to ensure that no through wall cracks exist prior to applying the overlay."
 - a) Discuss what criteria will be used to determine through wall cracks.
 - b) If a through-wall crack or cracks are identified, what process will the licensee follow? Discuss if a SWOL will still be used and if there will be any difference to a SWOL installed over a weld with through a through wall crack compared to a SWOL installed over a weld without through wall indications.

ENCLOSURE

- c) The bare metal visual examination of the pressurizer surge and decay heat drop line will not be able to detect flaws that initiate from the inside surface of the pipe and do not connect with the outside surface of the pipe. Also, once the weld overlay is installed on/over the original weld, the ultrasonic examination is only qualified to detect flaws in the outer 25 percent of the pipe thickness. Therefore, the integrity of the original weld/base metal region will not be able to be verified. Code Case N-740 of the ASME Code, Section XI provides requirements for crack growth calculations to demonstrate the structural integrity of the inner 75 percent pipe wall region. Discuss how the integrity of the original welds at TMI-1 will be demonstrated and what effects the assumed flaws will have on the SWOL design.
- 5) The licensee states that “The PZR spray nozzle dissimilar metal welds will receive bare metal visual and ultrasonic examinations and will only be overlay repaired if examination results indicate repair is necessary.”
 - a) Discuss and justify what criteria will be used to determine if a repair is necessary.
 - b) Describe the design of the SWOL that will be used to repair the PZR spray nozzle, include the differences between the design for SWOL for question 4(b) and 4(c) above.
 - 6) Describe how the licensee will monitor and control the heat input during welding.
 - 7) List which of the welds covered by Relief Request Number 2007-TMI-01 are covered by Leak-Before-Break (LBB) analysis, if any. Evaluate and discuss if the LBB analysis is still valid with the proposed structural weld overlay for each of the welds covered in LBB analysis.
 - 8) On the bottom of page 4 and the top of page 5 of Attachment 2 of the May 1, 2007 submittal, the licensee discusses the weld overlay of stainless steel weld DH-498. Clarify when and how weld DH-498 will be treated as part of the risk-informed ISI program. What subsequent ISI program will cover weld DH-498 once it has been overlaid.
 - 9) Discuss the acceptance criteria to disposition detected indications in the proposed overlays and base metal and the original welds during preservice and/or acceptance examination, and subsequent ISI examinations.
 - 10) Describe the ISI program plans for the proposed SWOL population. Discuss the frequency, population and examination techniques.