



GPU Nuclear Corporation
 Route 441 South
 P.O. Box 480
 Middletown, Pennsylvania 17057-0480
 (717) 944-7621
 Writer's Direct Dial Number:

717-948-8005

April 16, 1993
 C311-93-2031

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

Gentlemen:

Subject: Three Mile Island Nuclear Station Unit 1, (TMI-1)
 Docket No. 50-289
 Operating License No. DPR-50
 Relief from ASME Section XI Code Inservice Inspection (ISI)
 Requirements

10 CFR 50.55a(a)(3) states that proposed alternatives to the Section XI requirements may be used when authorized by the NRC and the applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety, or that compliance with the requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC Safety Evaluation Report (SER) dated October 8, 1992 responded to GPU Nuclear's April 19, 1991 submittal of basis documents for the revised Inservice Inspection (ISI) Program for the Second 10-Year Interval. The current ISI program was based on compliance with the 1986 Edition of the ASME Section XI Code. The SER granted relief from Code requirements found to be impractical. Certain requests for relief were denied, wholly or in part.

Attached is a request for relief from Code requirements submitted in accordance with 10CFR50.55a(g)(5)(iii) which meets the criteria of 10 CFR 50.55a(a)(3). This request is an extension of Relief Request No. 14, which was approved in part by the SER. Approval was granted to permit removal of the bolt nearest to the leak, rather than all of the bolts from a bolted connection where evidence of leakage is found during a Code inspection performed in accordance with ASME Section XI. GPU Nuclear requests relief from the absolute requirement [ASME Section XI, IWA-5250(a)(2)] to remove one bolt from a Class 1 bolted connection in all cases where there is evidence of leakage.

It is GPU Nuclear's position that evaluation of pressure test results for Class 2 and 3 bolted connections are addressed by Section XI paragraphs IWC-3516 and IWD-3000 which do not reference the paragraph, IWA-5250, that requires bolt removal.

9304220161 930416
 PDR ADCK 05000289
 PDR
 G

00019

A047
 11

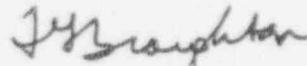
In certain cases where the connection cannot be isolated, bolt removal could cause a delay in startup or require a plant shutdown, imposing an unnecessary thermal transient on the plant. An unnecessary shutdown or delay in startup would present a hardship or unusual difficulty and could result in unnecessary personnel exposure without a compensating increase in the level of quality and safety. Under these circumstances, an engineering evaluation should be permitted to demonstrate whether removal of a bolt for examination may be deferred until the next outage of opportunity.

As an alternative to the Code requirements under these circumstances, GPU Nuclear proposes to apply appropriate criteria to evaluate whether leakage found during a VT-2 examination is an indication of degradation or will cause degradation prior to the next outage of opportunity. If the evaluation were inconclusive, one or more bolts would be removed and a VT-1 examination performed. Further details of the evaluation criteria and its justification are provided in the attachment.

The ASME Section XI Code Committee has recognized the hardship created by imposition of these requirements, especially during plant startup. A Code Case is being prepared which will alleviate the undue burden imposed by the absolute requirements for bolt removal introduced by the 1986 Code Edition. For this reason, temporary relief is requested through the next cycle of operation. GPU Nuclear anticipates that a Code Case will be approved by the end of TMI-1 Operating Cycle 10, scheduled for September 1995. Therefore, use of the evaluation procedure described in the attachment would be limited to one cycle of operation pending approval of evaluation criteria by the Code Committee.

Several system hydrostatic tests and operational leakage tests are scheduled to be completed before the end of the current 36 month ISI period which ends April 19, 1994. VT-2 examinations associated with these tests are planned before the Cycle 10 Refueling Outage (10R). Relief is requested by July 1993 to support the schedule for Section XI Pressure Tests that are planned before shutdown for the 10R outage.

Sincerely,



T. G. Broughton
Vice President and Director, TMI-1

MRK

Attachment

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

RELIEF REQUEST

COMPONENT DESCRIPTION: Bolted Connections
ISI CLASS: 1
DESIGN PRESSURE: Pressures up to 3050 psig
NORMAL OPERATING PRESSURE: Pressures up to 3050 psig

CODE REQUIREMENTS:

The 1986 Edition of ASME Section XI, IWA-5250(a)(2) introduced a requirement to remove Class 1 bolting and perform a VT-3 examination at bolted connections identified as leaking during an ASME Section XI system pressure test.

The NRC's SER has granted partial relief, but requires removal and VT-3 examination of the bolt closest to the leakage. If the bolt that was removed has evidence of degradation, the SER requires removal of all remaining bolts in the connection, VT-3 examination, and evaluation.

RELIEF BEING REQUESTED:

GPU Nuclear requests temporary relief for approval to allow the performance of an engineering evaluation in certain cases before removing bolting from a bolted connection where evidence of leakage was found during a Code inspection in accordance with ASME Section XI and the connection cannot be isolated without delaying startup or shutting down the plant.

Removal of bolting for examination to identify degradation would not be required:

1. Where the bolted connection was disassembled during the current plant or system outage and the bolts/studs have been replaced or inspected (VT-1) with little or no exposure to service conditions¹,
2. For non-face adjacent bolted connections where the bolt shanks are not hidden by the flange. In this case there is sufficient access and visibility to inspect the bolting without removal. As shown in Figure 1, the RCP flanges are an example of non-face adjacent bolted connections, where the bolt shanks are not hidden by the flanges. Gasket leakage would be visible. Because the gasket joint is adjacent to the shank, there would be no corrosion on the hidden portion of the shank without evidence of leakage on the visible portion of the shank.

¹ This position is supported by the ASME Interpretation XI-1-92-01 (File: IN90-023), dated September 10, 1991.

When bolt removal would require a delay in plant startup or shutdown because the connection cannot be isolated, and an engineering evaluation concludes that the materials involved:

- a) will not degrade from leakage of the process fluid, or
- b) will not degrade appreciably before the next scheduled plant or system outage,

removal of a bolt for VT-1 examination may then be deferred to the next time the portion of the system containing the bolted connection is out of service, but no later than the next refueling outage.

The engineering evaluation² used to justify continued service by deferring bolt removal will determine assurance of system operability and integrity of the bolted connection using as a minimum the following criteria:

1. Type of bolted connection (i.e., flange, bonnet, or manway), orientation, and the presence of insulation.
2. Size of the bolted connection. (The size of the connection would determine the potential consequences as result of failure at the connection).
3. Type of materials involved.
4. The temperature, pressure, and chemical corrosiveness of the process fluid on the stud/bolt material.
5. The amount of leakage and its influence on degradation of the stud/bolt (or confirmation that leakage has stopped).³
6. Stress load on the stud/bolt, including the potential for Intergranular Stress Corrosion Cracking (IGSCC).⁴
7. Visual evidence of corrosion on the stud/bolt.
8. Documented history of leakage at the joint in question.

² Evaluations conducted in accordance with this requirement will be traceable to the respective VT-2 examination which prompted the evaluation.

³ Allowable leakage is evaluated in accordance with Section XI paragraph IWB-3142, not to exceed TMI-1 Technical Specifications leakrate limits.

⁴ TMI-1 Corrective Maintenance Procedure 1410-Y-72, "Bolt/Nut Torquing and Sequences."

9. Documented history where degradation has occurred in a similar environment.
10. Other relevant considerations with regard to personnel, radiological, or nuclear safety.

Periodic evaluation of a leaking condition, including observation, will be required at least monthly where practical. Extension of the frequency of periodic evaluation will be determined based upon radiological conditions (location of the connection inside the Reactor Building or inside the D-Ring) and the likelihood that leakage will increase. Monitoring by Closed Circuit TV (CCTV) would be considered as an alternative. An increase in the leakage rate will require confirmation of the evaluation conclusions.

If the engineering evaluation is inconclusive or indicates a need for visual examination, the bolt closest to the source of the leakage will be removed, receive a VT-1 Examination,⁵ and be evaluated in accordance with IWA-3100(a).

If upon removal for examination the bolt fails the VT-1 acceptance criteria, all remaining bolting shall be removed, VT-1 examined, and evaluated in accordance with IWA-3100(a).

BASIS FOR RELIEF:

This request is an extension of Relief Request 14 from GPU Nuclear's submittal of April 19, 1991 which was approved in part by SER.

GPU Nuclear requests relief from the absolute requirement to remove one bolt from a bolted connection where there is evidence of leakage unless an engineering evaluation concludes that removal of a bolt is warranted. In cases where the connection cannot be isolated, bolt removal could require a delay in plant startup or a shutdown, imposing an unnecessary thermal transient on the plant. An unnecessary shutdown or delay in plant startup would present a hardship or unusual difficulty and potentially unnecessary personnel exposure without a compensating increase in the level of quality and safety.

Relief is requested from the Code requirements in order to apply appropriate criteria to evaluate whether evidence of leakage found during an examination is an indication of unacceptable bolting degradation. Removal of bolting for examination would clearly not be necessary where the bolts had been replaced during the current outage, or where the materials involved are not subjected to an environment that would be expected to cause degradation. Also, if evidence exists which indicates that the leakage found is not a

⁵ VT-1 is a more conservative examination than VT-3 and consistent with other bolting examinations.

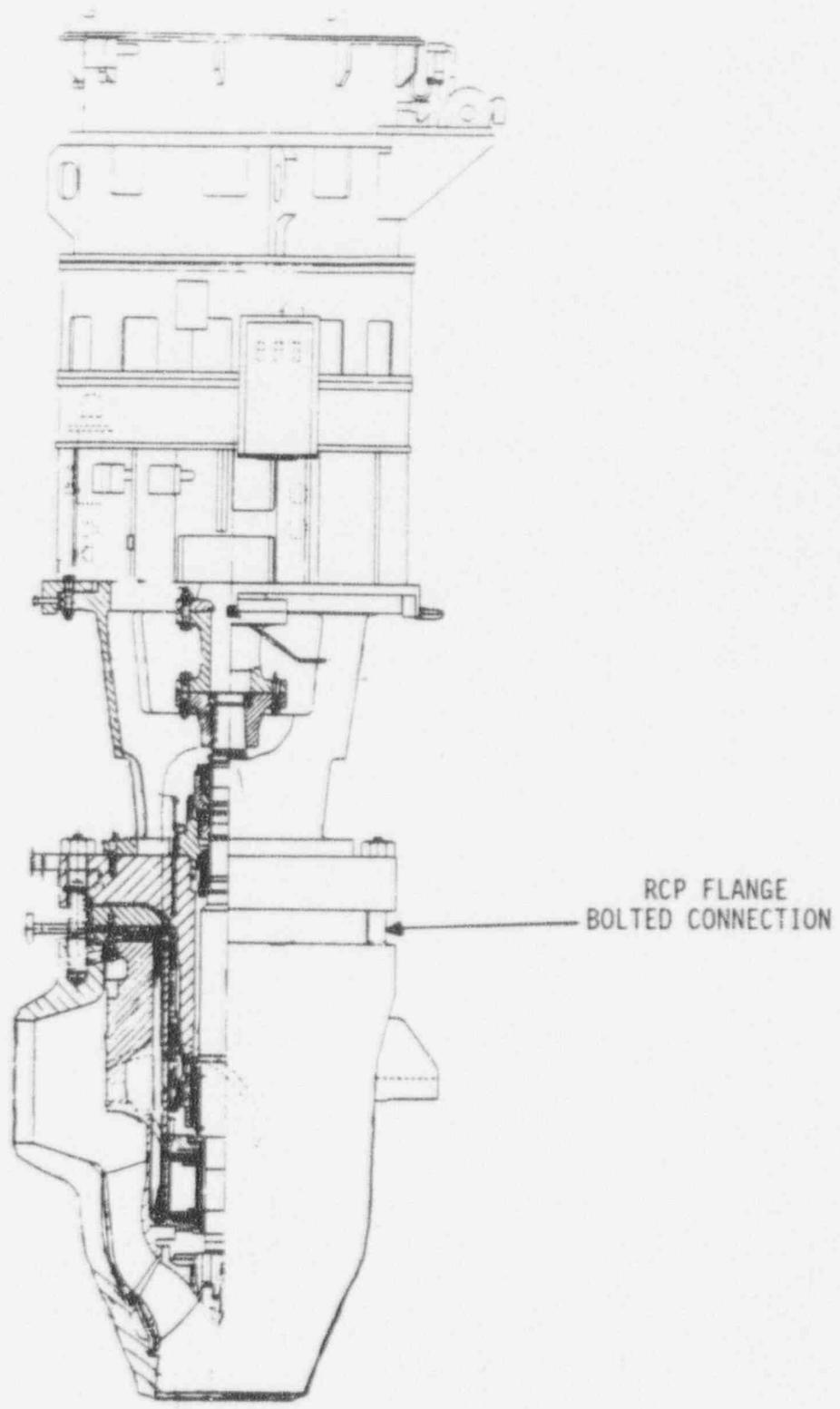
preexisting condition and the leakage has been stopped, the concern for corrosion of the bolting material is reduced.

As shown in Figure 1, the RCP flanges are an example of non-face adjacent bolted connections where the bolt shanks are not hidden by the flanges and therefore sufficiently exposed to permit an adequate visual examination. Periodic monitoring of the leaking connection will ensure that the basis for the evaluation conclusions do not change.

The ASME Section XI Code Committee has recognized the hardship imposed by required removal of bolting, especially during plant start-up. A Code Case is being drafted which will alleviate the undue burden imposed by requirements for bolt removal introduced in the 1986 Section XI Code Edition. For this reason temporary relief is requested for one cycle of operation, with the belief that a Code Case will be approved by the ASME and NRC by end of Operating Cycle 10, scheduled for September 1995.

Several system hydrostatic tests and operational leakage tests are scheduled to be completed before the end of the current 36 month ISI period which ends April 19, 1994. VT-2 examinations associated with these tests are planned before the Cycle 10 Refueling Outage (10R). Relief is requested by July 1993 to support the schedule for Section XI Pressure Tests that are planned before shutdown for the 10R outage.

FIGURE 1



TMI-1 REACTOR COOLANT PUMP (RCP)