

TMI-16-091
September 8, 2016

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Three Mile Island Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-50
NRC Docket No. 50-289

Subject: Response to Draft Request for Additional Information Regarding the Submittal of Relief Request RR-16-01 Concerning the Use of ASME Code Case N-722-2 for Three Mile Island Nuclear Station, Unit 1

- References:**
- 1) Letter from D. P. Helker (Exelon Generation Company, LLC) to the U.S. Nuclear Regulatory Commission, "Submittal of Relief Request RR-16-01 Concerning the Use of ASME Code Case N-722-2," dated May 27, 2016 (ADAMS Accession No. ML16148A109).
 - 2) E-mail correspondence from J. Poole (U.S. Nuclear Regulatory Commission) to S. J. Hanson (Exelon Generation Company, LLC), "Draft Request for Additional Information concerning Relief Request RR-16-01 regarding Alternate Examinations for Welds at the Bottom of the Reactor Vessel for Three Mile Island Nuclear Station, Unit 1," dated August 1, 2016 (ADAMS Accession No. ML16214A286).

By letter dated May 27, 2016, Exelon Generation Company, LLC (Exelon) requested approval to utilize Code Case N-722-2 in place of Code Case N-722-1 of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) as conditioned in Title 10, *Code of Federal Regulation* (10 CFR), Part 50, 10 CFR 50.55a(g)(6)(ii)(E) at Three Mile Island Nuclear Station, Unit 1. Exelon submitted Relief Request Number RR-16-01 regarding the alternate examination of nozzle-to-adapter welds at the bottom of the reactor vessel.

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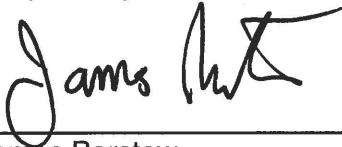
In the Reference 2 e-mail correspondence, the U.S. Nuclear Regulatory Commission (NRC) requested additional information (RAI) relating to Relief Request RR-16-01. In response to the RAI, Relief Request RR-16-01 is being submitted in accordance with 10 CFR 50.55a(z)(2) for approval of alternative to ASME, Section XI, Table IWB-2500-1.

The attached contains Exelon's response to the NRC request for additional information.

There are no regulatory commitments in this response.

If you have any questions concerning this response, please contact Stephanie J. Hanson at 610-765-5143.

Respectfully,



James Barstow
Director, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments:

1. Response to Draft Request for Additional Information Regarding the Submittal of Relief Request RR-16-01 Concerning the Use of ASME Code Case N-722-2 for Three Mile Island Nuclear Station, Unit 1
2. Revised Submittal of Relief Request RR-16-01 Concerning the Use of ASME Code Case N-722-2 (Revision 1)

cc: USNRC Region I, Regional Administrator
USNRC Senior Resident Inspector, TMI-1
USNRC Project Manager, TMI-1
R. R. Janati, Pennsylvania Bureau of Radiation Protection

ATTACHMENT 1

Three Mile Island Nuclear Station, Unit 1

Renewed Facility Operating License No. DPR-50

Docket No. 50-289

**Response to Draft Request for Additional Information Regarding the Submittal of Relief
Request RR-16-01 Concerning the Use of ASME Code Case N-722-2 for
Three Mile Island Nuclear Station, Unit 1**

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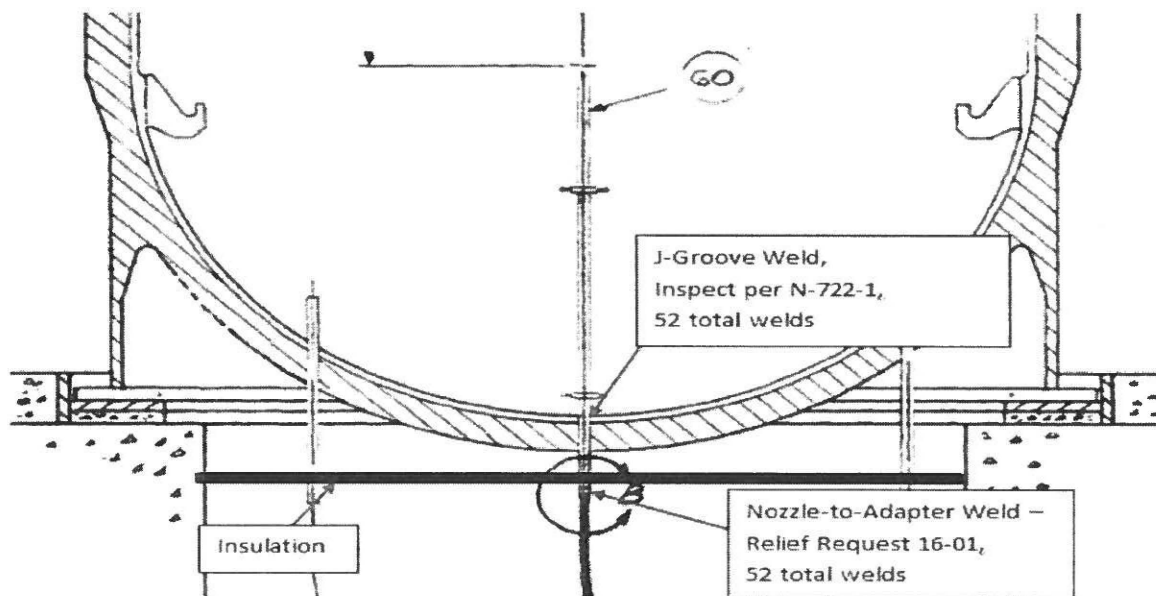
The NRC staff has determined that additional information is needed to complete its review. The specific requests for additional information (RAI) questions are restated below along with Exelon's response.

Question 1:

Table 1 of the relief request identifies weld number RCT0001INCORENOZZLES and number "52" as reactor vessel lower head incore penetrations. Discuss the total number of nozzle-to-adapter weld(s) that are covered under the relief request.

Response:

The number "52" in Table 1 represents the population of Incore Monitor Instrument penetration assemblies (incore penetrations). Each penetration includes the one (1) J-Groove Weld and the one (1) Nozzle-to-Adapter Weld. The Relief Request RR-16-01 covers the 52 Nozzle-to-Adapter welds. The identifier RCT00001INCORENOZZLES represents the 52 penetrations with 2 welds in each penetration. Therefore, the single identifier number applies to 104 welds. All 52 of the Nozzle-to-Adapter welds are covered under this relief request.



Question 2:

The licensee submitted Relief Request RR-16-01 pursuant to 10 CFR 50.55a(z)(1) which states that the proposed alternatives would provide an acceptable level of quality and safety. It is not clear to the NRC staff that the relief request would provide an acceptable level of quality and safety when the subject welds will not be inspected under the proposed alternative. The NRC staff suggests that the relief request be submitted under 10 CFR 50.55a(z)(2) which states that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Under 10 CFR 50.55a(z)(2), the licensee would need to discuss the hardship or unusual difficulty associated with performing examinations of the subject welds per ASME Code Case N-722-1.

Response:

Relief Request RR-16-01 has been revised to submit under 10 CFR 50.55a(z)(2). Attachment 2 provides a copy of the revised relief request which reflects the proposed change.

Question 3:

The licensee stated that a VT-2 visual examination will be performed on the subject welds to monitor leakage when the routine system leakage test is performed every refueling outage. The NRC staff understands that the area below the reactor vessel has high radiation and temperature. Describe in detail how the plant examiner performs the VT-2 visual examination of the subject welds. For example, does the plant examiner have the access to the bottom of the reactor vessel; where the examiner will be physically located to observe the welds; how will leakage be observed; does the examiner has a direct eye sight with short distance to the welds?

Response:

Three Mile Island has station procedures that include examination of the subject welds during reactor vessel pressure testing. The under-vessel area includes the Incore Monitoring piping (guide tubes) and the exposed subject nozzle-to-adapter welds. The welds are located several feet overhead with configuration preventing short distance direct sight inspection. Personnel enter the area under the reactor vessel for VT-2 exam of components and use IWA-5241 criteria (including IWA-5241(b)) inspecting insulation on the bottom of reactor vessel, accessible areas of incore monitoring guide tubes and the cavity floor and walls below the reactor vessel. Examination focuses on finding water or steam leakage from any pressure retaining boundary or insulation surrounding that boundary, evidence of leakage such as water or moisture collecting/flowing on walls/structures (e.g., puddles on the floor), boric acid residue, areas of general corrosion on pressure retaining components, or evidence of structural distress.

ATTACHMENT 2

Three Mile Island Nuclear Station, Unit 1

Renewed Facility Operating License No. DPR-50

Docket No. 50-289

**Revised Submittal of Relief Request RR-16-01 Concerning the Use of
ASME Code Case N-722-2 (Revision 1)**

10 CFR 50.55a Request Number RR-16-01

Proposed Alternative to Apply ASME Code Case N-722-2 for TMI, Unit 1
Incore Nozzle-to-Adapter Welds Containing Alloy 600/82/182
in Accordance with 10 CFR 50.55a(z)(2)

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1. ASME Code Component(s) Affected

Class 1 Reactor Coolant System Dissimilar Metal Welds Listed in Table 1 Below.

Table 1: TMI Unit 1 Class 1 Dissimilar Metal Welds

N-722-1 Item #	Size	Weld Number	Description
B15.80	<1"	RCT0001INCORENOZZLES	Reactor Vessel Lower Head Incore Penetrations (52)

Note: RCT0001INCORENOZZLES represents 52 Incore Monitor Instrument penetration assemblies with 104 total welds. There are 52 J-Groove welds and 52 nozzle-to-adapter welds. The nozzle-to-adapter weld is located below the Reactor Vessel insulation (Figure 1).

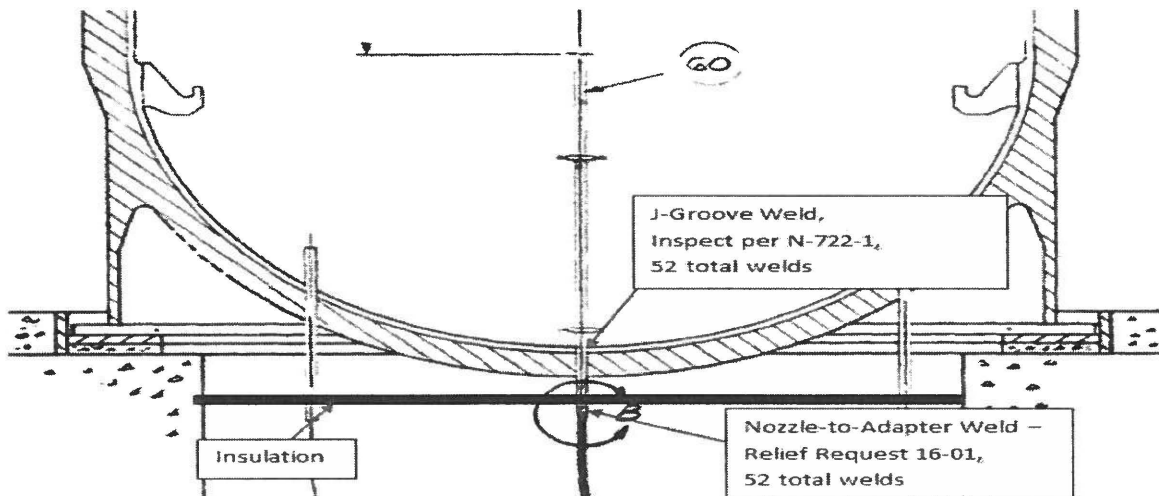


Figure 1: Bottom Mounted Nozzle Weld Configuration

2. Applicable Code Edition and Addenda

Three Mile Island Nuclear Station (TMI), Unit 1, complies with American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2004 Edition, No Addenda.

3. Applicable Code Requirement

- As required by 10CFR50.55a(g)(6)(ii)(E), Code Case N-722-1, "Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials Section XI, Division 1" is utilized as amended by 10CFR50.55a(g)(6)(ii)(E).

10 CFR 50.55a Request Number RR-16-01

Proposed Alternative to Apply ASME Code Case N-722-2 for TMI, Unit 1
Incore Nozzle-to-Adapter Welds Containing Alloy 600/82/182
in Accordance with 10 CFR 50.55a(z)(2)

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(Throughout this request ASME Code Case N-722-1 is referred to CC N-722-1)

4. Reason for Request

Relief Request RR-16-01 is submitted under 10 CFR 50.55a(z)(2) since continued inspection of the 52 Incore nozzle-to-adapter welds is conducted in a substantive radiation field. The alternative to continued compliance with CC N-722-1 inspection for the nozzle-to-adapter welds (Item B15.80) eliminates the radiological hardship and overall station personnel exposure without an adverse reduction in the level of quality and safety.

TMI asserts that continued inspection of the nozzle-to-adapter welds per CC N-722-1 is a hardship without a compensating increase in the level of quality and safety because the welds operate below the temperature of increased primary water stress corrosion cracking susceptibility (525 °F). Visual inspection (VT-2) of the welds will continue during reactor vessel pressure testing conducted at normal operating temperature and pressure each refueling outage. As such, VT-2 examination per Section XI maintains an acceptable level of quality and safety in lieu of the CC N-722-1.

CC N-722-1 was revised to CC N-722-2 in 2010 and provides alternate examination requirements to those in CC N-722-1. These alternative requirements are consistent with CC N-770-1 as welds at operating temperatures less than 525 °F are removed from scope. This request is intended to utilize Note 2 of CC N-722-2 and remove the nozzle-to-adapter welds from the examination scope as the operating temperature is less than 525 °F.

5. Proposed Alternative and Basis for Use

Exelon Generation Company, LLC (EGC) proposes to utilize Note 2 of CC N-722-2 to remove welds less than 525 °F from the examination scope. Utilization of this Note from CC N-722-2 will result in the following change to the TMI, Unit 1 ISI Program.

- Remove the nozzle-to-adapter welds located under the Reactor Vessel insulation from examination under TMI, Unit 1 component number RCT0001INCORENOZZLES, Code Case N-722-1 and N-722-2 item number B15.80. The nozzle-to-adapter welds are removed from the examination scope because the temperature is less than 525 °F and is exempted by Note 2 of Code Case N-722-2.

The TMI, Unit 1 ISI Program modifications discussed above are justified based on the following:

- The BMN nozzle-to-adapter welds are less susceptible to Primary Water Stress Corrosion Cracking (PWSCC) due to the lower temperatures associated with the weld. The exclusion of welds 525 °F or less is consistent with the requirements of CC N-770-1, approved for use by the NRC.

10 CFR 50.55a Request Number RR-16-01

Proposed Alternative to Apply ASME Code Case N-722-2 for TMI, Unit 1
Incore Nozzle-to-Adapter Welds Containing Alloy 600/82/182
in Accordance with 10 CFR 50.55a(z)(2)

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- Additionally, the Incore Tubes from the Reactor Vessel to the Incore Table are within the RCS System Pressure Test (VT-2) examination boundary that is performed every refueling outage. Leakage from these welds would be visible during the RCS pressure test as no insulation is installed over the welds.

6. Duration of Proposed Alternative

The proposed relief request to utilize Note 2 of CC N-722-2 is applicable for the TMI, Unit 1 fourth ISI interval which ends April 19, 2022. The use of Note 2 from CC N-722-2 is requested until the NRC publishes the code case in a future revision of Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," or a later version of 10CFR50.55a.

7. References

1. ASME Code Case N-722-1, "Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials Section XI, Division 1."
2. ASME Code Case N-722-2, "Visual Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials, Section XI, Division 1."
3. ASME Code Case N-770-1, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated With UNS N062082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1."
4. ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2004 Edition, No Addenda.