

10 CFR 50.55a

TMI-10-102
October 13, 2010

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: Submittal of Relief Request RR-10-01 Concerning Control Rod Drive Housing
Examinations Associated with the Third Inservice Inspection (ISI) Interval

Attached for your review is a relief request associated with the third Inservice Inspection (ISI) interval for Three Mile Island Nuclear Station (TMI), Unit 1. TMI, Unit 1 is requesting relief from Table IWB-2500-1, Examination Category B-O, Item Number B14.10, which requires volumetric or surface examination of the pressure retaining Control Rod Drive (CRD) butt welds in 10% of the peripheral CRD housings. The third interval of the TMI, Unit 1 ISI program complies with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1995 Edition, 1996 Addenda. We request your approval by October 13, 2011.

There are no regulatory commitments in this letter.

If you have any questions concerning this letter, please contact Tom Loomis at (610) 765-5510.

Respectfully,



Pamela B. Cowan
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment: Relief Request RR-10-01

cc: Regional Administrator, Region I, USNRC
USNRC Senior Resident Inspector, TMI
USNRC Project Manager, TMI

ATTACHMENT

Relief Request RR-10-01

**Relief Request RR-10-01 for Alternative Control Rod Drive Housing Examinations
in Accordance with 10 CFR 50.55a(a)(3)(i)
(Page 1 of 6)**

1. ASME Code Component(s) Affected

Code Class: 1
Reference: Table IWB-2500-1
Examination Category: B-O
Item Number: B14.10
Description: Selection of Control Rod Drive (CRD) housing welds for examination
Component Number: Various

2. Applicable Code Edition and Addenda

The Inservice Inspection (ISI) program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1995 Edition, 1996 Addenda.

3. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-O, Item Number B14.10 requires volumetric or surface examination of the pressure retaining CRD butt welds in 10% of the peripheral CRD housings.

4. Reason for Request

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative will provide an acceptable level of quality and safety.

TMI, Unit 1 has sixty-nine (69) CRD locations which have four butt welds each (shown in Figure RR-10-01.1 – welds “A”, “B”, “C”, and “D”). Twenty-four (24) of these CRD locations are categorized as “peripheral” per Examination Category B-O. Ten percent of the peripheral CRD housings equates to an examination of three (3) CRD locations. Peripheral housing welds with the “D” designator in Figure RR-10-01.1 are accessible for NDE examination through access ports in the reactor vessel closure head service structure and are not applicable to this relief request. CRD housing welds with an “A”, “B”, or “C” designator as shown in Figure RR-10-01.1 are only accessible for examination when a CRD is removed from the reactor vessel closure head. As shown in Figure RR-10-01.2, the “Service Structure” surrounding the CRDs causes interferences that result in the peripheral CRD housing welds being inaccessible for examination unless the CRD is removed to gain access.

Literal compliance with Table IWB-2500-1, Examination Category B-O requires that only welds on the peripheral CRD locations can be credited for meeting the code requirements. It is believed that the intent of this requirement was to provide greater flexibility in meeting the code by requiring examination of the peripheral locations as compared to the inner locations. Typically, examination of welds on non-peripheral CRD locations is limited due to access restrictions. However, the code did not account for some plants, such as TMI, Unit 1, that have a Service Structure that makes examination of the peripheral CRD locations more difficult.

**Relief Request RR-10-01 for Alternative Control Rod Drive Housing Examinations
in Accordance with 10 CFR 50.55a(a)(3)(i)
(Page 2 of 6)**

Over the course of a ten-year ISI interval, a small population of CRDs (though often not peripheral in location) are removed for various purposes which allows an opportunity to perform examinations. At this time, no peripheral CRDs are expected to be removed during the upcoming outage (Fall 2011). The Fall 2011 outage is the last outage in the third ISI interval.

During the third interval in the first period (2001), six (6) CRDs not in the periphery were examined and no indications were identified. There were no examination limitations reported for these welds. A review of ISI data for examinations of welds "A", "B", and "C" completed since 1986 identified no degradation. Visual examination of the flange region of all CRDs is completed using remote video each outage to assure there is no leakage from the mechanical joint. Small leakage from the welds above the flange that might not be evident during the normal Section XI VT-2 examination pressure tests would likely be observed during the flange video examinations.

The cost for removal and reinstallation of three peripheral CRDs in order to meet the literal compliance with this code requirement is estimated to be greater than \$80,000. The estimated dose for removing and re-installing three control rod drive mechanisms to perform the inspection is greater than 1.3 Rem.

A review of the operating conditions between the interior and peripheral CRD locations shows that the difference in operating temperatures is not significant.

The motor tube (RCS pressure boundary) weldments (welds "A", "B", and "C") are located above an internal thermal barrier which results in the welds being at a lower operating temperature as shown in Figure RR-10-01.3. The thermal barrier restricts the thermal circulation of hot, primary coolant and acts as an insulator between the reactor vessel and the drive. The maximum steady state operating temperature for the internal components above the thermal barrier is 470°F. Welds "A" and "B" are located slightly above the internal rotor assembly (further away from the top of the reactor vessel head) so their operating temperature is slightly lower. Additionally, an external water cooled stator-water jacket assembly is installed over the motor tube region of welds "A" and "B" for all 69 drives which leads to a relatively consistent temperature. Weld "C" is located approximately 165" above weld "B" and is the coolest of the three welds based on the lack of flow and distance from the RV closure head.

Accordingly, an examination sample of welds from interior drive locations is essentially equivalent to a sample of welds from the peripheral drive locations and will adequately represent the condition of the Examination Category B-O welds.

5. Proposed Alternative and Basis for Use

As a proposed alternative, TMI Unit 1 will credit the examinations of the "A", "B", and "C" designator welds on three non-peripheral (3) CRD housings, performed in the first period of the third interval. The examinations performed met the requirements of Table IWB-2500-1 Examination Category B-O for NDE methods, area examined, and acceptance.

**Relief Request RR-10-01 for Alternative Control Rod Drive Housing Examinations
in Accordance with 10 CFR 50.55a(a)(3)(i)
(Page 3 of 6)**

Examination of the CRD housing welds on any of the 69 CRD locations provides an equivalent level of quality and safety.

TMI, Unit 1 will complete the examination of the "D" designator welds shown in Figure RR-10-01.1 on three (3) peripheral CRD housings in accordance with Table IWB-2500-1 requirements.

TMI, Unit 1 will perform an ASME Section XI, Category B-O examination of the "A", "B", and "C" welds on at least one peripheral CRD housing during the first period of the fourth ISI interval and complete the remaining examinations during the interval as required by ASME Section XI. As an alternative to the first period examination, TMI, Unit 1 may replace the current population of CRDs with new CRDs during the first period of the fourth ISI interval and complete the subsequent fourth ISI interval examinations in accordance with ASME Section XI.

6. Duration of Proposed Alternative

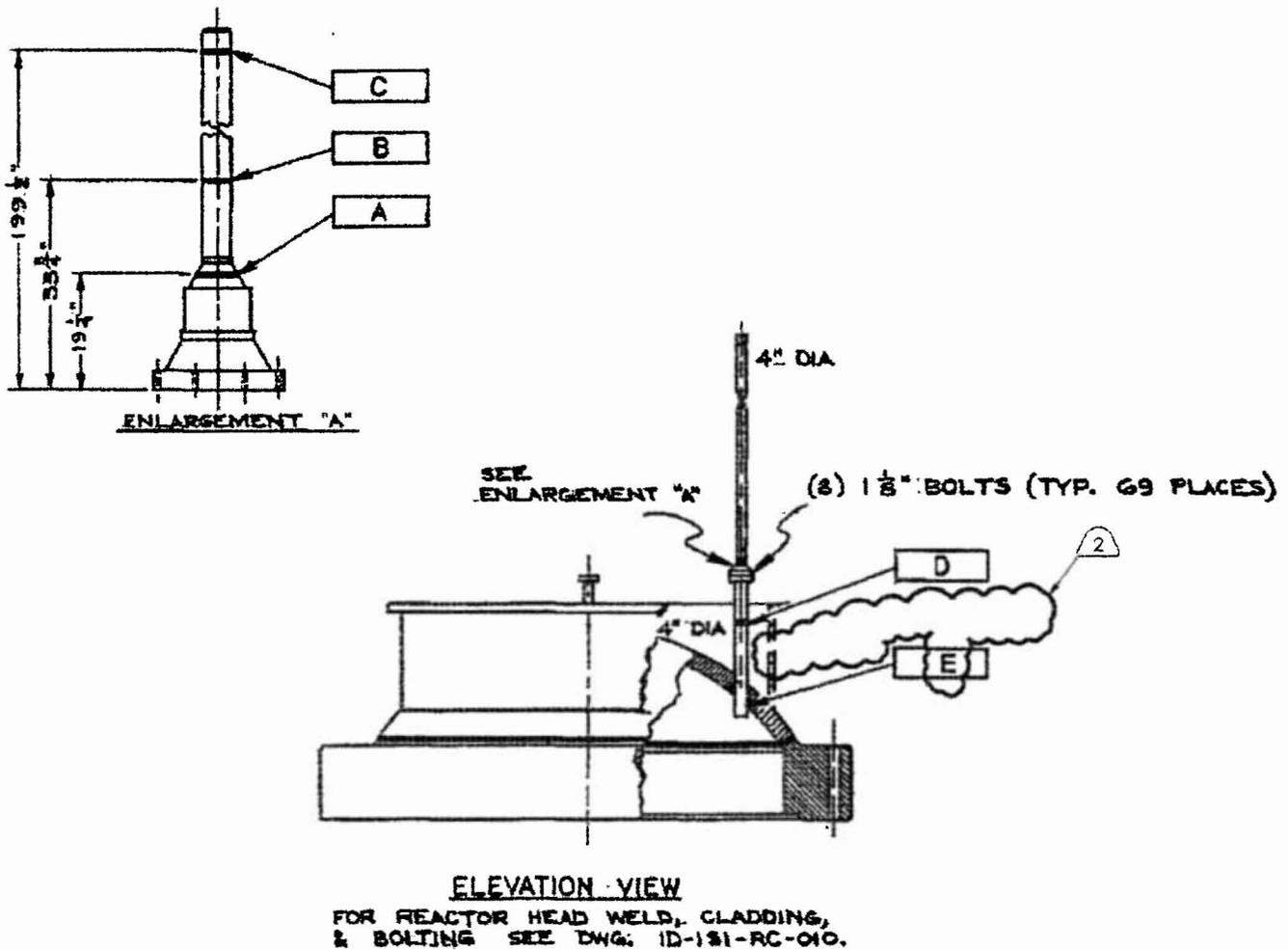
Relief is requested for the third ten-year ISI interval for TMI, Unit 1. The third ten-year interval began on April 20, 2001.

7. Precedents (Optional)

None.

Relief Request RR-10-01 for Alternative Control Rod Drive Housing Examinations
in Accordance with 10 CFR 50.55a(a)(3)(i)
(Page 4 of 6)

FIGURE RR-10-01.1
CRD Housing Weld Locations
(Excerpt from TMI drawing 1D-ISI-RC-011)



Relief Request RR-10-01 for Alternative Control Rod Drive Housing Examinations
in Accordance with 10 CFR 50.55a(a)(3)(i)
(Page 5 of 6)

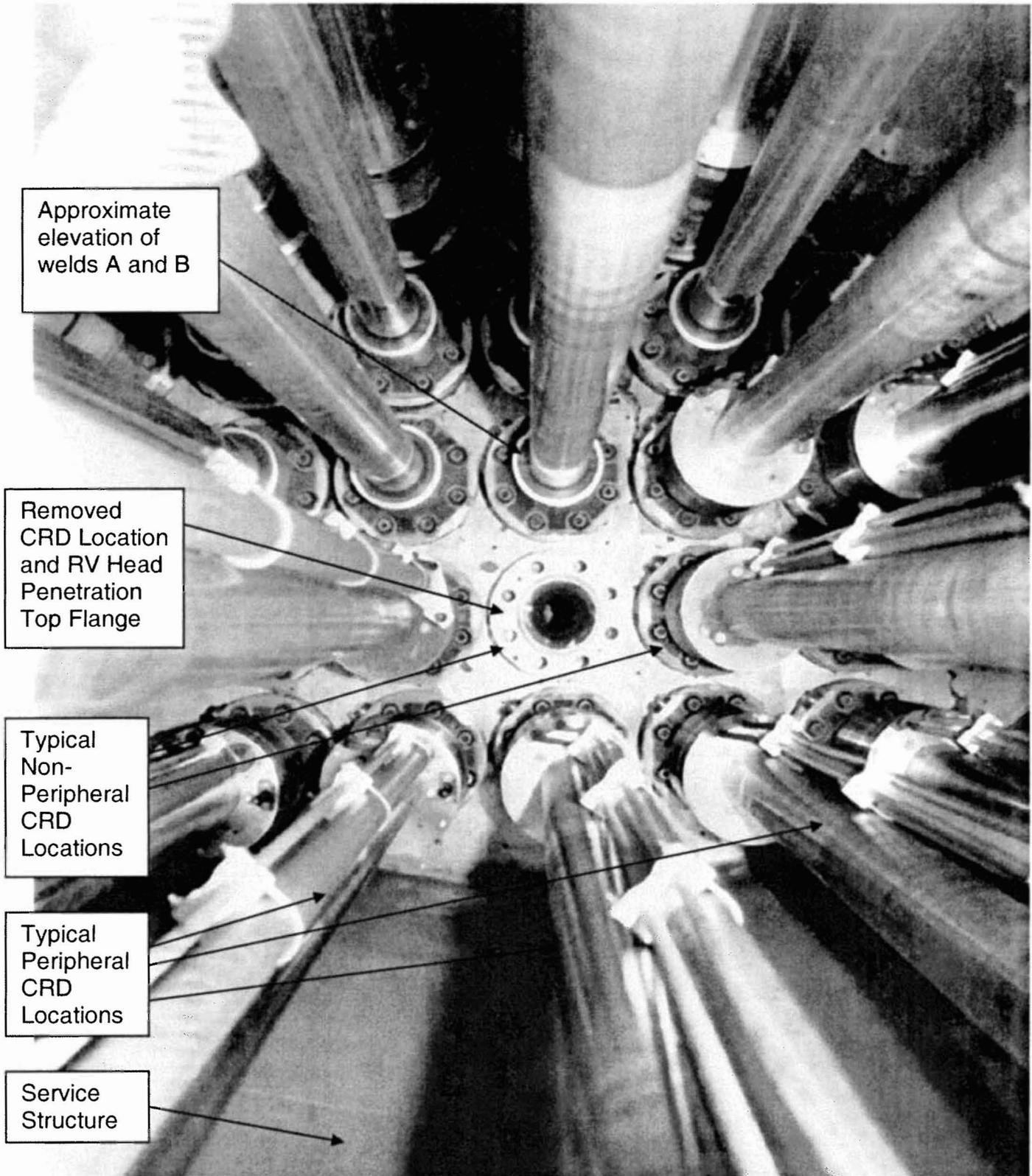


FIGURE RR-10-01.2
CRD Housings and Weld Locations
Photograph from Top of Service Structure Looking Down

Relief Request RR-10-01 for Alternative Control Rod Drive Housing Examinations
in Accordance with 10 CFR 50.55a(a)(3)(i)
(Page 6 of 6)

FIGURE RR-10-01.3
CRD Schematic and Materials

