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RBG-47826

March 5, 2018

Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: Request for Alternative in Accordance with 10 CFR 50.55a (g)(5)(iii) Proposed
Alternative to 10 CFR 50.55a Examination Requirements for Pressure Retaining
Welds in Control Rod Housings (RR- RBS-ISI-016)
River Bend Station, Unit 1
Docket No. 50-458
License No. NPF-47

REFERENCE: Supplement to RBS-ISI-016 and RBS-ISI-017, Requests for Relief from ASME
Code Section XI Inservice Inspection Requirements for Pressure Retaining
Welds in Control Rod Housings and Pressure Retaining Welds in Pumps and
Valves, RBG-47272 August 2, 2012

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (g)(5)(iii), Entergy requests relief from certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPV), Section XI, Sub Article IWB-2500 Inservice Inspection (ISI) requirements for Examination Category B-O, Pressure Retaining Welds in Control Rod Housings. This relief is requested for the third 10-year interval of the Inservice Inspection Program for the River Bend Station (RBS).

In accordance with 10 CFR 50.55a(g)(6)(i), the proposed relief to the referenced requirements may be approved by the NRC giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Entergy believes full compliance with the ASME Code, Section XI requirements is not practical. The specific details of the requested relief are enclosed in Attachment 1.

The NRC previously granted relief for these examinations in the Safety Evaluations listed in Section 8 (Precedents) of Attachment 1 listed below.

There are no regulatory commitments contained in this submittal. This submittal does reference a commitment made in 2012 (Reference 1). This commitment was retired per the Entergy Commitment Management Program and NEI 99-04 "Guidelines for Managing NRC Commitment Changes," Revision 0.

If you require additional information, please contact Mr. Tim Schenk at (225)-381-4177 or tschenk@entergy.com.

Sincerely,



TAS/alc

Attachments:

1. Third 10 Year Interval Inservice Inspection Program - Request For Relief
RBS-ISI-016

cc: (with Enclosure)

U. S. Nuclear Regulatory Commission
Attn: Lisa Regner
11555 Rockville Pike
Rockville, MD 20852

U.S. Nuclear Regulatory Commission
Region IV
1600 East Lamar Blvd.
Arlington, TX 76011-4511

NRC Resident Inspector
PO Box 1050
St. Francisville, LA 70775

Central Records Clerk
Public Utility Commission of Texas
1701 N. Congress Ave.
Austin, TX 78711-3326

Department of Environmental Quality
Office of Environmental Compliance
Radiological Emergency Planning and Response Section
Ji Young Wiley
P.O. Box 4312
Baton Rouge, LA 70821-4312

RB1-18-0014
LAR-2018-03

**ATTACHMENT 1
RBG-47826**

**RIVER BEND STATION – UNIT 1
THIRD 10 YEAR INTERVAL INSERVICE INSPECTION PROGRAM**

REQUEST FOR RELIEF

RBS-ISI-016

**RIVER BEND STATION - UNIT 1
THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF RBS-ISI-016
10 CFR 50.55a(g)(5)(iii)
Inservice Inspection Impracticability**

1. ASME Code Component(s) Affected

The River Bend Station, Unit 1 (RBS) Class 1, Reactor Vessel Pressure Retaining Welds in Control Rod Drive (CRD) Housings that are required for volumetric or surface Inservice Inspection (ISI) examinations that have been determined to be inaccessible are included in this relief request and the following Code Class, Examination Category, and Item Number apply.

Code Class:	1
Examination Category:	B-O, "Pressure Retaining Welds in Control Rod Drive Housings"
Item Number:	B14.10, "Reactor Vessel Welds in CRD Housings"

2. Applicable Code Edition and Addenda

The applicable ASME Boiler and Pressure Vessel Code of Record (hereafter referred to as the "Code") edition and addenda is ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, 2001 Edition through 2003 Addenda, Reference (1) used for the Third 10-Year Inservice Inspection (ISI) Interval (May 31, 2008 to November 30, 2017) at RBS as modified by 10 CFR 50.55a where applicable.

3. Applicable Code Requirements

ASME Section XI requires in Table IWB-2500-1, Examination Category B-O, Pressure Retaining Welds in CRD Housings, Item No. B14.10, Reactor Vessel Welds in CRD Housings, that a volumetric or surface examination of 10% of the peripheral CRD housing welds as defined by Figure IWB-2500-18, be examined once each inspection interval.

As previously defined in 10 CFR 50.55a(g)(6)(ii)(A)(2) now removed, and ASME Code Case N-460, Reference (2), as approved in Regulatory Guide 1.147, the Code Case states that essentially 100% means more than 90% of the examination volume or required surface area of each weld where the reduction in coverage is due to interference by another component or part geometry and has been applied at RBS. Additional guidance in NRC Information Notice 98-42, Reference (3), has also been applied at RBS on how ASME Section XI should meet examination coverage criteria in Code Case N-460. However, limited coverage did not apply to the lower (Weld #1s) that are the subject of this relief request because they are not accessible for the required volumetric or surface examination.

4. Reason for Request

Impracticality of Compliance

10 CFR 50.55a(g)(5)(iii), states in part, that licensees may determine that conformance with certain code requirements is impractical and that the licensee shall notify the U.S. Nuclear Regulatory Commission (NRC or Commission) and submit information in support of the determination. Determination of impracticality in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the code requirements during the inservice inspection interval for which the request is being submitted. Requests for relief made in accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial 120-month inspection interval or subsequent 120-month inspection interval for which relief is sought.

Pursuant to 10 CFR 50.55a(g)(5)(iii) described above and 10 CFR 50.55a(g)(iv), the required submittal of this relief request is due on or before November 30, 2018 for RBS, because Entergy has determined that compliance with the code requirements of examining the lower (Weld #1) on the 4 selected peripheral CRD housings cannot be performed and to examine this weld is impractical for RBS. This relief request is based on actual demonstrated limitations experienced when attempting to comply with the code requirements in the performance of the lower (Weld #1s) listed in this relief request.

Based on the Second 10-Year ISI Interval Relief Request RBS-ISI-016 and the NRC Safety Evaluation Report (SER) for that request, Reference (4), Entergy made a commitment to the NRC that stated:

“Entergy will continue to investigate and evaluate for suitability alternative inspection methods, such as the remote camera suggested by the NRC, for the third and subsequent ISI intervals as long as the impracticality remains.”

Because of this commitment a surface examination technique using a Liquid Penetrant (PT) method was developed for the upper (Weld #2) during the Third 10-Year ISI Interval and the required surface examination of this weld was performed on the 4 scheduled CRD housings during RF19 and no indications were identified. Thus, (Weld #2) has now met the code requirements for the Third 10-Year ISI Interval at RBS and no longer requires relief for impracticality.

The as-installed configuration of the 36 peripheral CRD housings makes performance of the 4 required weld examinations on the lower (Weld #1) in the required 10% or 4 of the 36 peripheral CRD housings impractical for the following reasons. The housings are laterally proximate to the reactor vessel support pedestal, which limits access to the lower welds on the outer circumference of the housings. Next, the subject welds are below the lower reactor insulation support structure where the housings pass through a series of closely-spaced CRD housing support beams and associated hanger rods, which further limit access to the welds of the lower portion of the housings. Access to the lower welds from below is also limited by a series of CRD housing support bars, grid plates and grid clamps. Access to the lower welds from the housing inside diameter requires removal of the CRD mechanisms and sleeves. However, earlier attempts to examine these lower welds from the Inside diameter when the CRDs were disassembled for maintenance during the First,

Second, and now the Third 10-Year ISI Intervals have proven to be impractical, See Diagrams 1 – 5.

Burden Caused by Compliance

To comply with the code required examination volume or surface area for obtaining essentially 100% coverage for the lower (Weld #1) of the 4 selected peripheral CRD housings listed in this relief request, See Table 1, the welds, the adjacent housing supports and their structures would have to be physically modified and/or disassembled beyond their current design. Overall, the CRD housings and flange fittings associated with the lower welds listed in this relief request are constructed of standard design items meeting typical national standards that specify required configurations and dimensions. To replace these items with items of alternate configurations to enhance examination coverage would require unique redesign and fabrication. Because these items are in the Class 1 boundary and form a part of the reactor coolant pressure boundary, their redesign and fabrication would be an extensive effort based on the limitations that exist.

The required volumetric or surface examination methods to be used for lower (Weld #1) on the 4 scheduled peripheral CRD housings described in this relief request were reviewed to determine if any coverage at all could be achieved by improving the required methods using newly developed techniques and none could be identified.

Additionally, even though the welds of the selected 4 peripheral CRD housings are required to be examined to meet the 10% code requirement, it makes no difference which 4 peripheral CRD housings are selected to have their welds examined as the restrictions and limitations are the same for all 36 peripheral CRD housings and their lower (Weld #1).

Therefore, RBS has determined that obtaining essentially 100% coverage for the examination of the lower (Weld #1) on the 4 peripheral CRD housings selected for examination is not feasible and is impractical without adding additional burden consisting of significant redesign work, increased radiation exposure, and/or potential damage to the plant or the component itself.

5. Proposed Alternative and Basis for Use

Proposed Alternative

- 1) Periodic system pressure tests and VT-2 visual examinations will continue to be performed in accordance with ASME Section XI, Examination Category B-P, for the Class 1 pressure retaining welds and items each refueling outage in accordance with Table IWB-2500-1, which includes the CRD housing welds.

Basis for Use

RBS has attempted to perform ISI examinations of the selected welds in this relief request in accordance with the requirements of 10 CFR 50.55a, plant technical specifications, and the 2001 Edition through the 2003 Addenda, of the ASME Boiler and Pressure Vessel Code, Section XI. When a component or item is found to have condition(s), which limits the required examination volume or surface area, RBS is required to submit this information to

the enforcement and regulatory authorities having jurisdiction at the plant site. This relief request has been written to address the areas where these types of conditions exist specifically as related to the lower (Weld #1) where the housing tube-to-flange is stainless steel for the 4 selected peripheral CRD housings that are not accessible for examination.

10 CFR 50.55a(g)(4) recognizes that throughout the service life of a nuclear power facility, components which are classified as ASME Code Class 1, Class 2 and Class 3 must meet the requirements set forth in the ASME Code to the extent practical within the limitations of design, geometry and materials of construction of the welds and items as those listed in Table 1 and as shown in Diagrams 1 - 5.

The following RCS leakage detection equipment and requirements help to ensure the early identification of any leakage of these welds during Reactor Coolant System (RCS) operation. Even though the welds associated with the examinations identified in this relief request could not be surface or volumetrically examined there is instrumentation in place to assure that early detection of any RCS pressure boundary leakage is identified. This is accomplished by the leakage monitoring systems inside the drywell at RBS where the RCS leakage detection systems are required to be operable per the Limiting Condition for Operation (3.4.7). The system's instrumentation consists of the drywell or pedestal floor drain sump monitoring system, the drywell atmospheric monitoring system or atmospheric gaseous monitoring system, and the drywell air cooler flow rate monitoring system. These systems are used to quantify any unidentified leakage from the RCS and to meet the RBS Technical Specifications Limiting Condition for Operation in (3.4.5) associated with RCS Operational Leakage. RCS Surveillance Requirements (SR, 3.4.7.1, 3.4.7.2, 3.4.7.3, and 3.4.5.1) require the Limiting Conditions for Operation of the RCS leakage detection systems and for the identification of any RCS operational leakage that states: "RCS Operational Leakage shall be limited to (a) No pressure boundary leakage; (b) ≤ 5 gallons per minute (gpm) unidentified leakage; (c) ≤ 30 gpm total leakage averaged over the previous 24 hour period; and (d) ≤ 2 gpm increase in unidentified leakage within the previous 24 hour period in MODE 1.

Based upon satisfactory examination results of the upper (Weld #2) surface examination performed on each of the 4 selected peripheral CRD housings, where no PT indications were identified, coupled with applicable leakage monitoring and required system pressure tests with VT-2 visual examinations, no further action can be taken by Entergy at this time to improve the examinations of the lower (Weld #1) without applying impractical options. Therefore, the proposed alternatives in this relief request will provide assurance of an acceptable level of quality and safety by providing reasonable assurance of structural integrity.

6. Conclusion

Entergy believes that the requirements of 10 CFR 50.55a(g)(5)(iii) have been satisfied by the contents and descriptions of the limitations in this relief request. The RBS Third 10-Year ISI Interval ended on November 30, 2017 and all the limited examinations contained in this relief request are required to be submitted to the NRC on or before 12 months after this date, which would be November 30, 2018. Thus, Entergy requests that review and granting of this relief request be completed before the start of the first Fourth 10-Year ISI Interval examinations that are scheduled to commence sometime in the fall of 2019.

7. Duration of Proposed Alternative

This relief request covers the examinations of the required (Weld #1) on the 4 peripheral CRD housings that cannot be examined for the Third 10-Year ISI Interval that started on May 31, 2008 and ended on November 30, 2017.

8. Precedents

Note: Industry requests for relief due to impracticality associated with CRD housing welds are common, but vary in regards to the proposed alternatives by licensees due to their specific designs. Some of the more recent NRC approvals of these relief requests are listed below and more have been submitted that have not been granted to date:

- 1 NRC Safety Evaluation Report (SER) for Brunswick Steam Electric Plant, Units 1 and 2 – Relief Request Number RR-46 for the Third 10-Year Inservice Inspection Interval (TAC NOS. ME1249 and ME1250), Dated: April 7, 2010, [ADAMS Accession No. ML100491269]
- 2 NRC Safety Evaluation Report (SER) for Clinton Power Station, Unit No. 1 – Relief Request (RR) 4220, Specifically for the Control Rod Drive Housing (CRDH) Welds, Regarding Examination Coverage for the Second 10-Year Inservice Inspection (ISI) Interval (TAC NOS. ME4183, ME4184, ME4185, ME4186, ME4187, ME4188 and ME4189), Dated June 17, 2011, [Adams Accession No. ML15195A495]

9. References

- (1) ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, 2001 Edition through 2003 Addenda.
- (2) ASME Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds Section XI, Division 1.
- (3) NRC Information Notice 98-42, Implementation of 10 CFR 50.55a(g) Inservice Inspection Requirements, Dated: December 1, 1998.
- (4) NRC Safety Evaluation Report (SER) for River Bend Station, Unit 1 – Request for Alternative (RBS-ISI-016 for CRD Housing Welds) and (RBS-ISI-017 Not Applicable to This Relief Request), Proposed Alternative to 10 CFR 50.55a Examination Weld Requirements for Reactor Vessel Weld Inspections (TAC NOS. ME1507 and ME6844), Dated: August 31, 2012, [ADAMS Accession No. ML12235A308].

**RIVER BEND STATION – UNIT 1
THIRD 10 YEAR INTERVAL INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF**

TABLE 1 – AFFECTED COMPONENTS

COMPONENT NO	CATEGORY	ITEM NUMBER	DESCRIPTION⁽¹⁾
B13-DOO8-04/17-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/17-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/21-WELD-1 ⁽²⁾	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/21-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/25-WELD-1 ⁽²⁾	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/25-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/29-WELD-1 ⁽²⁾	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/29-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/33-WELD-1 ⁽²⁾	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/33-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/41-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-04/41-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-08/13-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-08/13-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-08/45-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-08/45-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-12/09-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-12/09-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-12/49-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-12/49-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-16/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-16/05-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-16/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-16/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-20/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-20/05-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-20/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-20/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-24/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-24/05-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-24/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-24/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-28/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-28/05-WELD-2	B-O	B14.10	Welds in CRD Housing

**RIVER BEND STATION – UNIT 1
THIRD 10 YEAR INTERVAL INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF**

TABLE 1 – AFFECTED COMPONENTS

COMPONENT NO	CATEGORY	ITEM NUMBER	DESCRIPTION⁽¹⁾
B13-DOO8-28/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-28/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-32/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-32/05-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-32/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-32/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-36/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-36/05-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-36/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-36/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-40/05-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-40/05-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-40/53-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-40/53-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-44/09-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-44/09-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-44/49-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-44/49-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-48/13-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-48/13-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-48/45-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-48/45-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/17-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/17-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/21-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/21-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/25-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/25-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/29-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/29-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/33-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/33-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/37-WELD-1	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/37-WELD-2	B-O	B14.10	Welds in CRD Housing
B13-DOO8-52/41-WELD-1	B-O	B14.10	Welds in CRD Housing

**RIVER BEND STATION – UNIT 1
THIRD 10 YEAR INTERVAL INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF**

TABLE 1 – AFFECTED COMPONENTS

COMPONENT NO	CATEGORY	ITEM NUMBER	DESCRIPTION⁽¹⁾
B13-DOO8-52/41-WELD-2	B-O	B14.10	Welds in CRD Housing

Notes:

- (1) There are 36 peripheral CRD housings and each housing has one lower (Weld #1) and one upper (Weld #2).
- (2) These lower (Weld #1s) could not be surface or volumetrically examined and are the subject of this relief request.

DIAGRAM 1
General Configuration

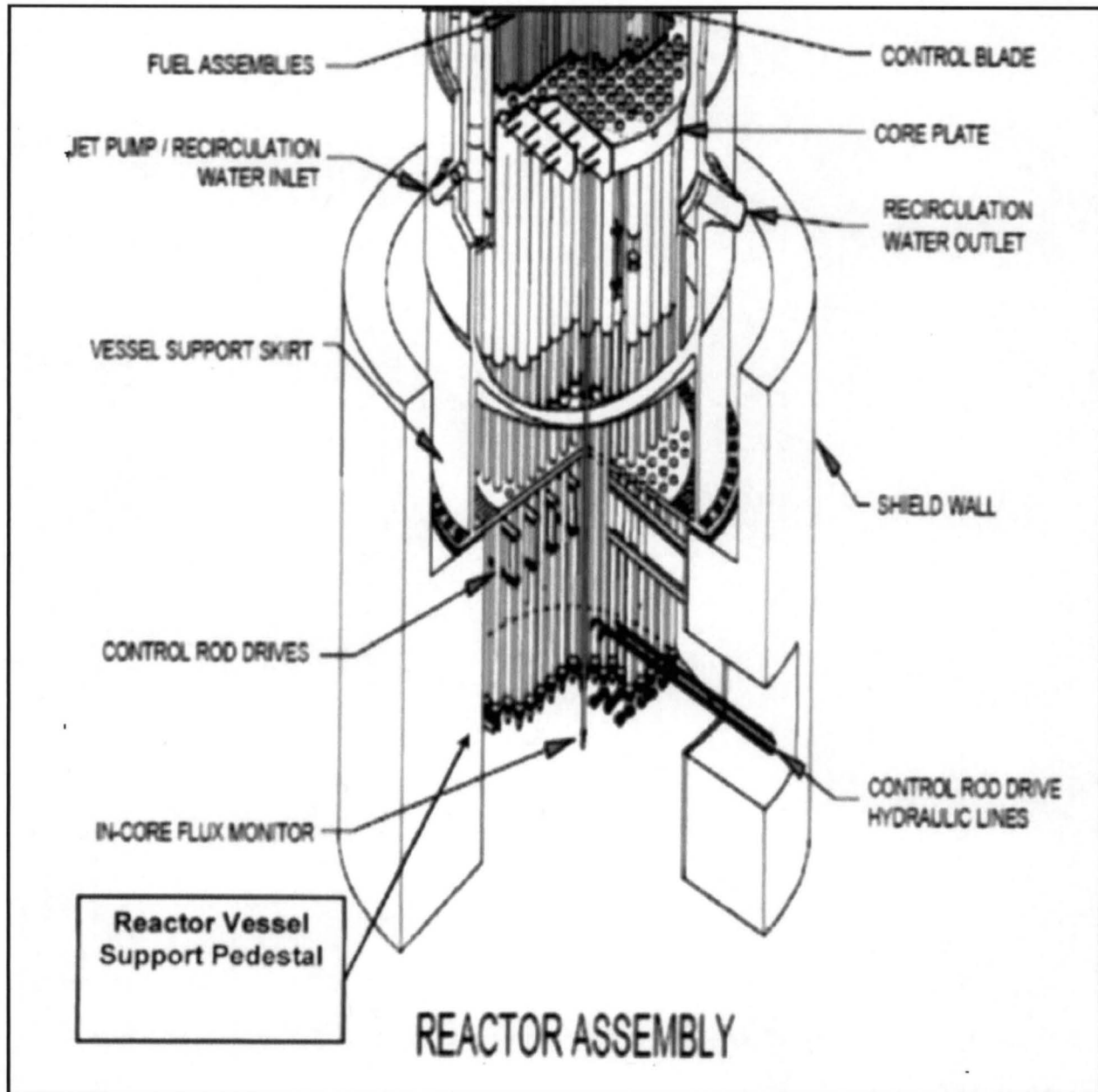


DIAGRAM 2
Elevation View

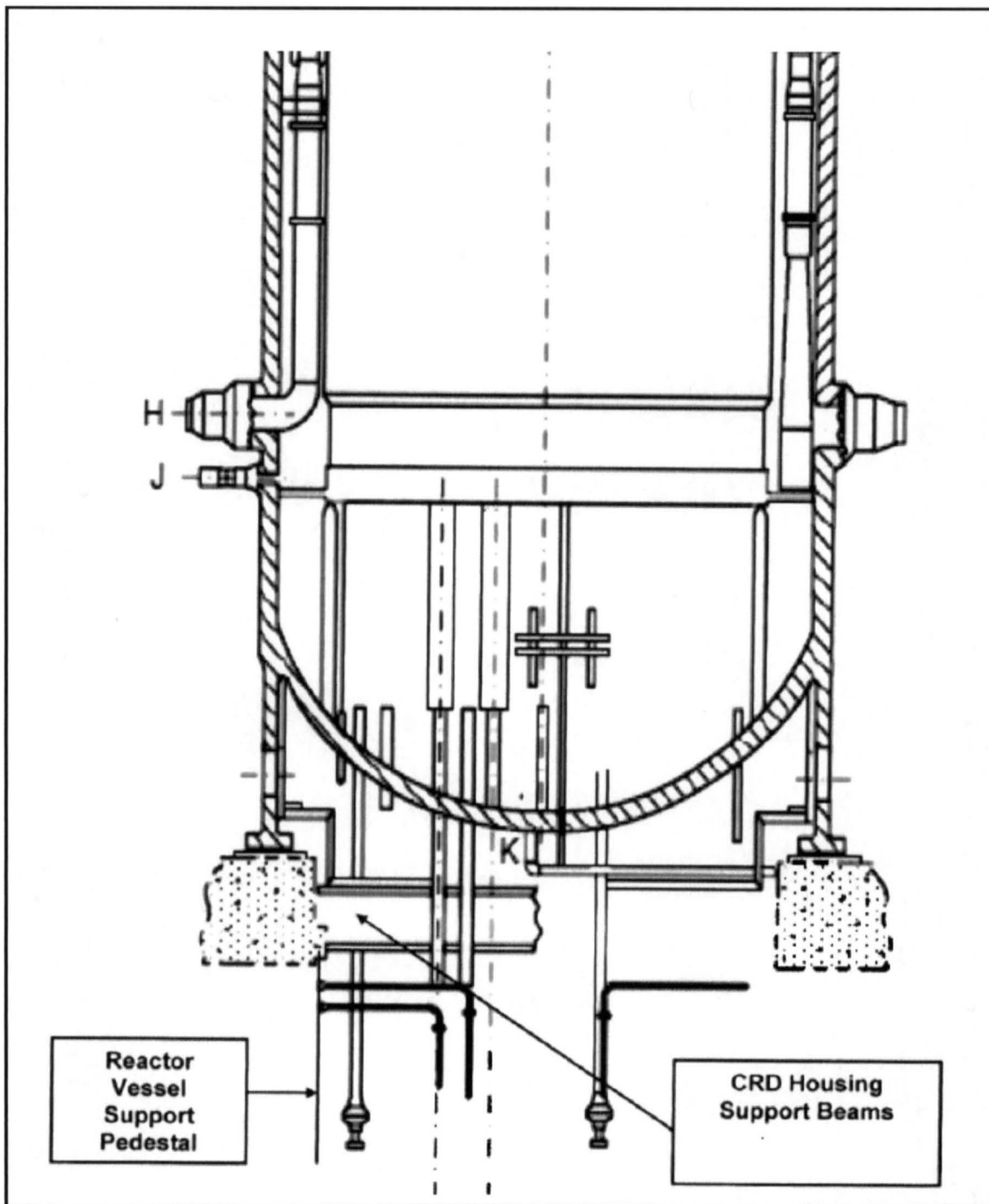


DIAGRAM 3
CRD Housing Support Structures

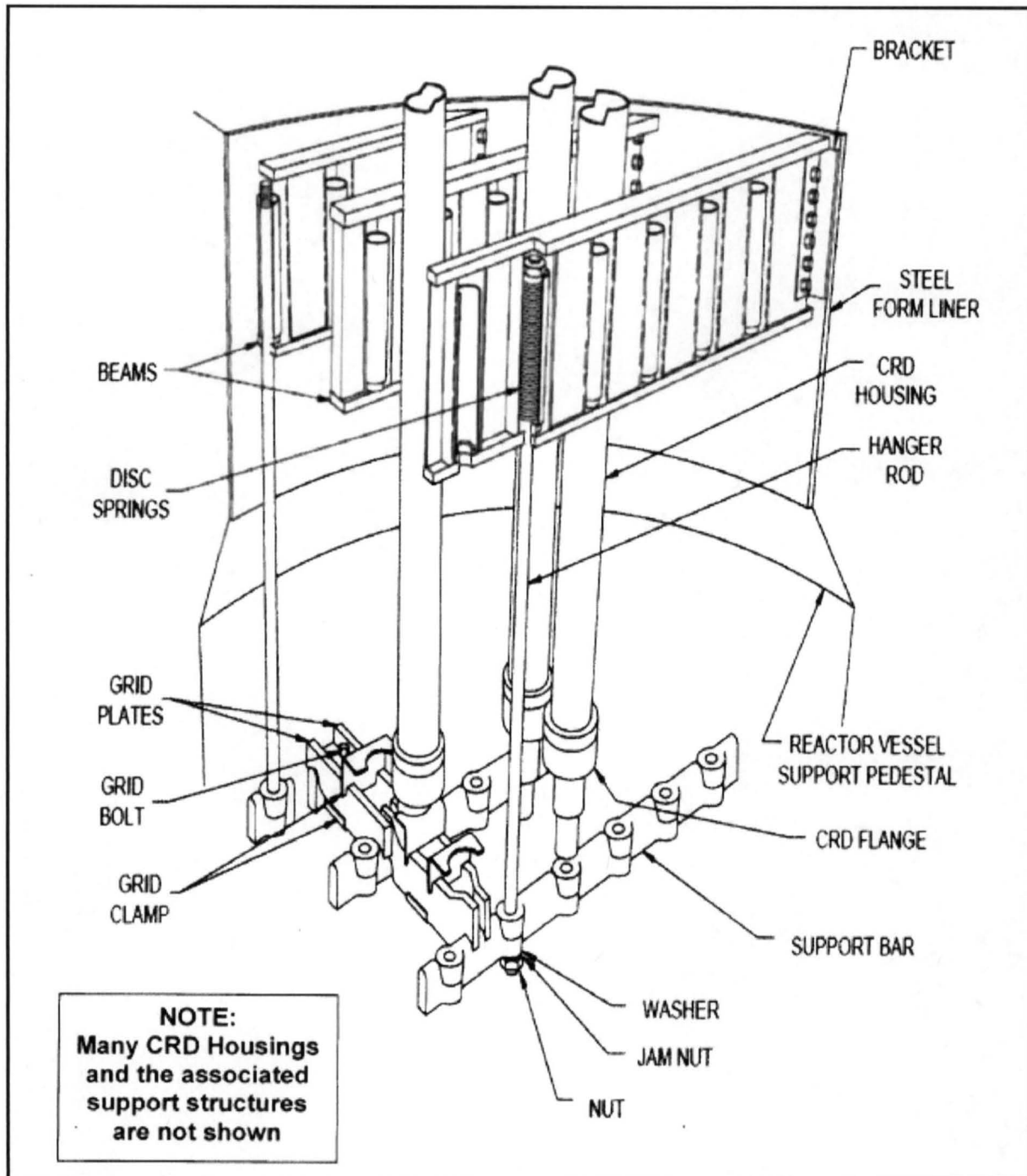


DIAGRAM 4
CRD HOUSING Coordinates

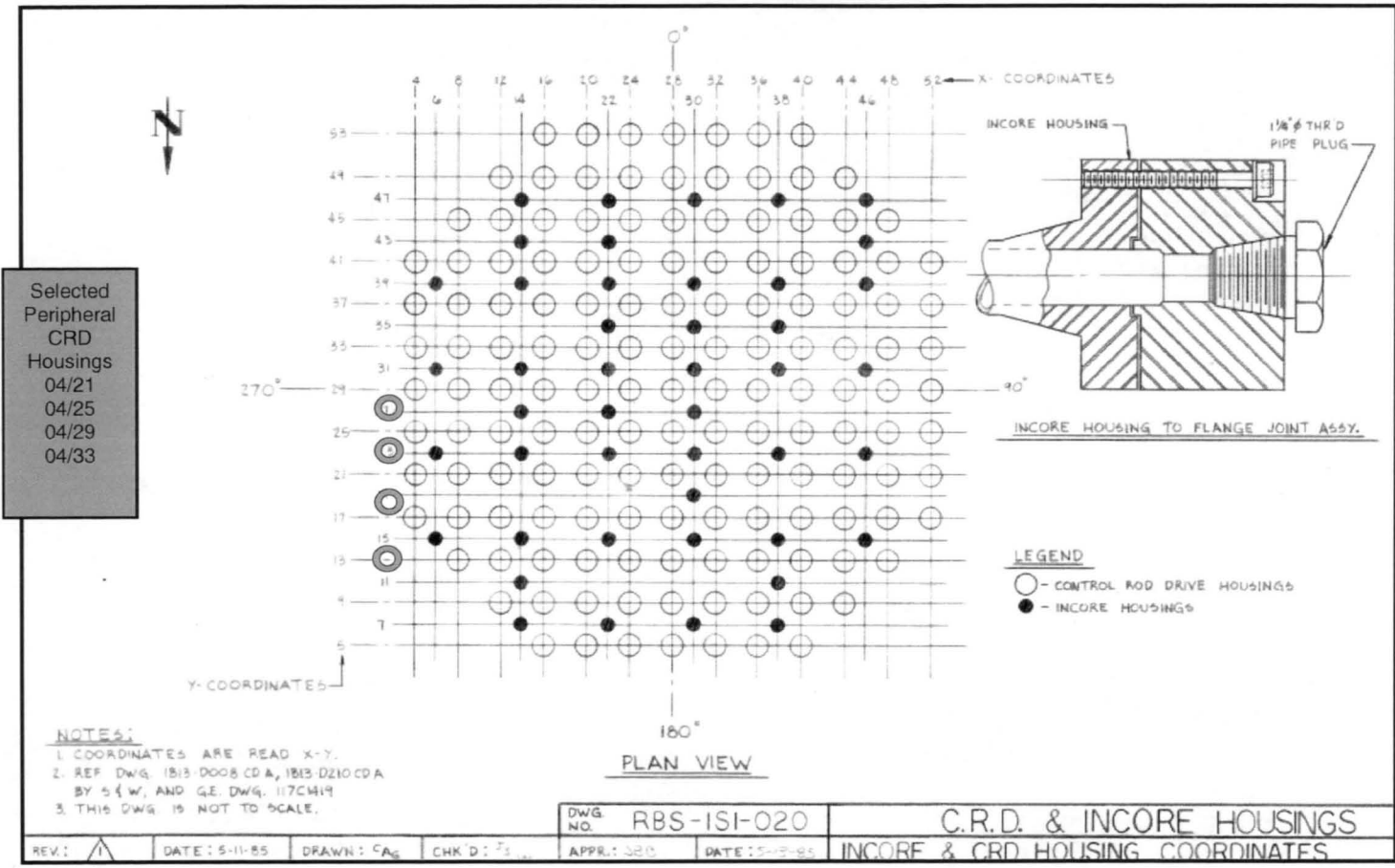


DIAGRAM 5
CRD Housing Weld Map

