

March 10, 2016

10 CFR 50.55a(g)(5)(iii)

Serial: BSEP 16-0018

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324
Proposed Alternative for ASME Code, Section XI Inservice Inspection
Requirements (Relief Request ISI-06)

Reference: 1. Letter from Douglas A. Broaddus (USNRC) to Michael J. Annacone (Carolina Power & Light Company), *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 Number ML100491269.

Ladies and Gentlemen:

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (g)(5)(iii), Duke Energy Progress, Inc. (Duke Energy), requests NRC approval of a proposed alternative to the applicable edition of the American Society of Mechanical Engineers (ASME) Code, Section XI, for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. Duke Energy is submitting this proposed alternative for Section XI control rod drive housing weld examinations that are required to be performed during the fourth 10-year inservice inspection interval for both Unit 1 and Unit 2.

The specific details of the proposed alternative are provided in the enclosure of this letter.

The NRC previously approved this proposed alternative for the third 10-year inservice inspection interval (i.e., Reference 1).

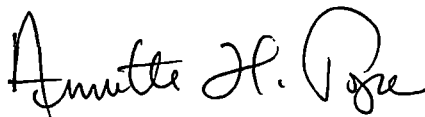
Duke Energy requests approval of this proposed alternative by March 1, 2017.

There are no new regulatory commitments in this letter.

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NRR

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager - Regulatory Affairs, at (910) 457-2487.

Sincerely,

A handwritten signature in black ink, appearing to read "Annette H. Pope". The signature is fluid and cursive, with the first name "Annette" being more prominent than the last name "Pope".

Annette H. Pope
Director – Organizational Effectiveness
Brunswick Steam Electric Plant

Enclosure: 10 CFR 50.55a Request Number ISI-06

cc (with enclosure):

U.S. Nuclear Regulatory Commission, Region II
ATTN: Ms. Catherine Haney, NRC Regional Administrator
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U.S. Nuclear Regulatory Commission
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ATTN: Ms. Michelle P. Catts, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Mr. Cliff Dautrich, Bureau Chief
North Carolina Department of Labor
Boiler Safety Bureau
1101 Mail Service Center
Raleigh, NC 27699-1101

10 CFR 50.55a Request Number ISI-06

Proposed Alternative In Accordance with 10 CFR 50.55a(g)(5)(iii)

- Inservice Inspection Impracticality -

1. ASME Code Components Affected

Unit(s) Affected:	Brunswick Steam Electric Plant (BSEP), Units 1 and 2
Component(s) Affected:	See Tables 1 (Unit 1) and 2 (Unit 2) below
Code Class:	Class 1
References:	Subarticle IWB-2500, Table IWB-2500-1
Examination Categories:	B-O, "Pressure Retaining Welds in Control Rod Housings"
Item Numbers:	B14.10, "Welds in CRD Housing"
Description:	Volumetric Examination Coverage
Inspection Interval:	Fourth 10-Year Interval (May 11, 2008, through May 10, 2018)

2. Applicable Code Edition

The Inservice Inspection Program for the fourth 10-year inservice inspection interval is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2001 Edition with 2003 Addenda. The fourth 10-year inservice inspection interval began on May 11, 2008, and will end on May 10, 2018.

3. Applicable Code Requirement

The ASME Code, Section XI, 2001 Edition with 2003 Addenda, Table IWB-2500-1, Examination Category B-O, Pressure Retaining Welds in Control Rod Housings, item B14.10 as defined by Figure IWB-2500-18, requires a volumetric or surface examination of 10 percent of the peripheral control rod drive (CRD) housing welds. Duke Energy Progress, Inc. (Duke Energy) has elected to perform surface examinations on the selected CRD housing welds.

4. Impracticality of Compliance

There are 36 control rod housings on the periphery. Each housing has an upper and lower weld, for a total of 72 welds (i.e., see Attachments 1 and 2). A surface examination of 10 percent of these welds would require the welds of four housings (i.e., eight welds) to be examined.

The as-installed configuration of the 36 peripheral CRD housings makes performance of the required examinations impractical. The housings are laterally adjacent to the reactor vessel support pedestal, which limits access to the upper and lower welds on the outer circumference of the CRD housing. The 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 limits access to the welds in the upper

portion of the housings. Access to both the upper and lower welds from below is limited by a series of CRD housing support bars, grid plates, and grid clamps, as shown in the two photographs in Attachment 3. Access to the lower welds from the housing inside diameter requires removal of the CRD mechanisms and sleeves.

5. Burden Caused by Compliance

To perform the Code-required surface examination, the CRDs and reactor vessel support skirt would require design modification to allow access for the examination.

6. Proposed Alternative and Basis for Use

Proposed Alternative

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested from the requirement of the ASME Code, Section XI, Sub-article IWB-2500, Table IWB-2500-1, Examination Category B-O, "Pressure Retaining Welds in Control Rod Drive Housings", Examination Item Number B14.10, "Welds in CRD Housing" from performing the volumetric or surface examination of 10 percent of the peripheral CRD housing welds.

During the previous inspection interval, Duke Energy performed qualified surface examinations, listed in the table below, that achieved 100 percent coverage. The examinations conducted confirmed satisfactory results, with no unacceptable flaws being identified and no evidence of degradation mechanisms.

As an alternative, Duke Energy proposes selecting the four, per unit, additional upper CRD housing welds, listed below, in lieu of the four lower housing-to-flange welds. This would provide the same total number of CRD housing welds for examination (i.e., eight welds) and will be an equivalent 100 percent inspection of 10 percent of the peripheral housings. The CRD housing locations that are listed below are shown on Attachment 1 (i.e., for BSEP Unit 1) and Attachment 2 (i.e., for BSEP Unit 2).

Brunswick Unit 1			
Percent of Code-Required Volume Achieved			
Original Sample		Additional Sample	
1C11-CRD06-11-SW2	100% Coverage Achieved	1C11-CRD38-47-SW2	100% Coverage Achieved
1C11-CRD06-15-SW2	100% Coverage Achieved	1C11-CRD42-47-SW2	100% Coverage Achieved
1C11-CRD10-07-SW2	100% Coverage Achieved	1C11-CRD46-39-SW2	100% Coverage Achieved
1C11-CRD14-07-SW2	100% Coverage Achieved	1C11-CRD46-43-SW2	100% Coverage Achieved

Brunswick Unit 2 Percent of Code-Required Volume Achieved			
Original Sample		Additional Sample	
2C12-CRD38-47-SW2	100% Coverage Achieved	2C12-CRD06-11-SW2	100% Coverage Achieved
2C12-CRD42-47-SW2	100% Coverage Achieved	2C12-CRD06-15-SW2	100% Coverage Achieved
2C12-CRD46-39-SW2	100% Coverage Achieved	2C12-CRD10-07-SW2	100% Coverage Achieved
2C12-CRD46-43-SW2	100% Coverage Achieved	2C12-CRD14-07-SW2	100% Coverage Achieved

Basis for Use

Examining the four additional upper CRD housing welds, in lieu of the four lower CRD housing welds, will essentially meet the Code requirements. This will provide reasonable assurance of the CRD housing integrity.

The ASME Code, Section XI, Sub-article IWB-2500, Table IWB-2500-1, requires essentially 100 percent volumetric or surface examination of 10 percent of the peripheral CRD housing welds (i.e., Examination Category B-O, Item No. B14.10, as defined by Figure IWB-2500-18). Each CRD housing contains two pressure retaining welds. BSEP has 36 peripheral CRD housings (i.e., 72 CRD housing welds); therefore, this requires four CRD housings (i.e., a total of eight CRD housing welds) to be examined. Table IWB-2500-1 requires both the upper and lower welds of each of the selected CRD housings to be examined:

As Class 1 Examination Category B-O components, a visual (VT-2) examination is also performed on these components during system pressure tests each refueling outage. This was completed during the Unit 1 2014 refueling outage (i.e., the B120R1 outage) and the Unit 2 2015 refueling outage (i.e., the B222R1 outage), and no evidence of leakage was identified in the weldments of these components.

7. Duration of the Proposed Alternative

This proposed alternative will be used for the entire fourth 10-year inservice inspection interval at BSEP, Units 1 and 2. The fourth 10-year interval for both units began on May 11, 2008, and will end on May 10, 2018.

8. Precedents

The proposed alternative was previously approved by the NRC for the third 10-year inservice inspection interval for BSEP (i.e., Reference 1). The circumstances and basis for the previous approval of this relief have not changed because the accessibility of the applicable component welds for inspection has not changed. Also, there has not been a change to the applicable ASME Code, Section XI requirement since the previous approval of this relief.

Similar alternatives have been previously approved by the NRC for Cooper Nuclear Station (i.e., Reference 2), the River Bend Station (i.e., Reference 3), and the Clinton Power Station (i.e., Reference 4).

9. References

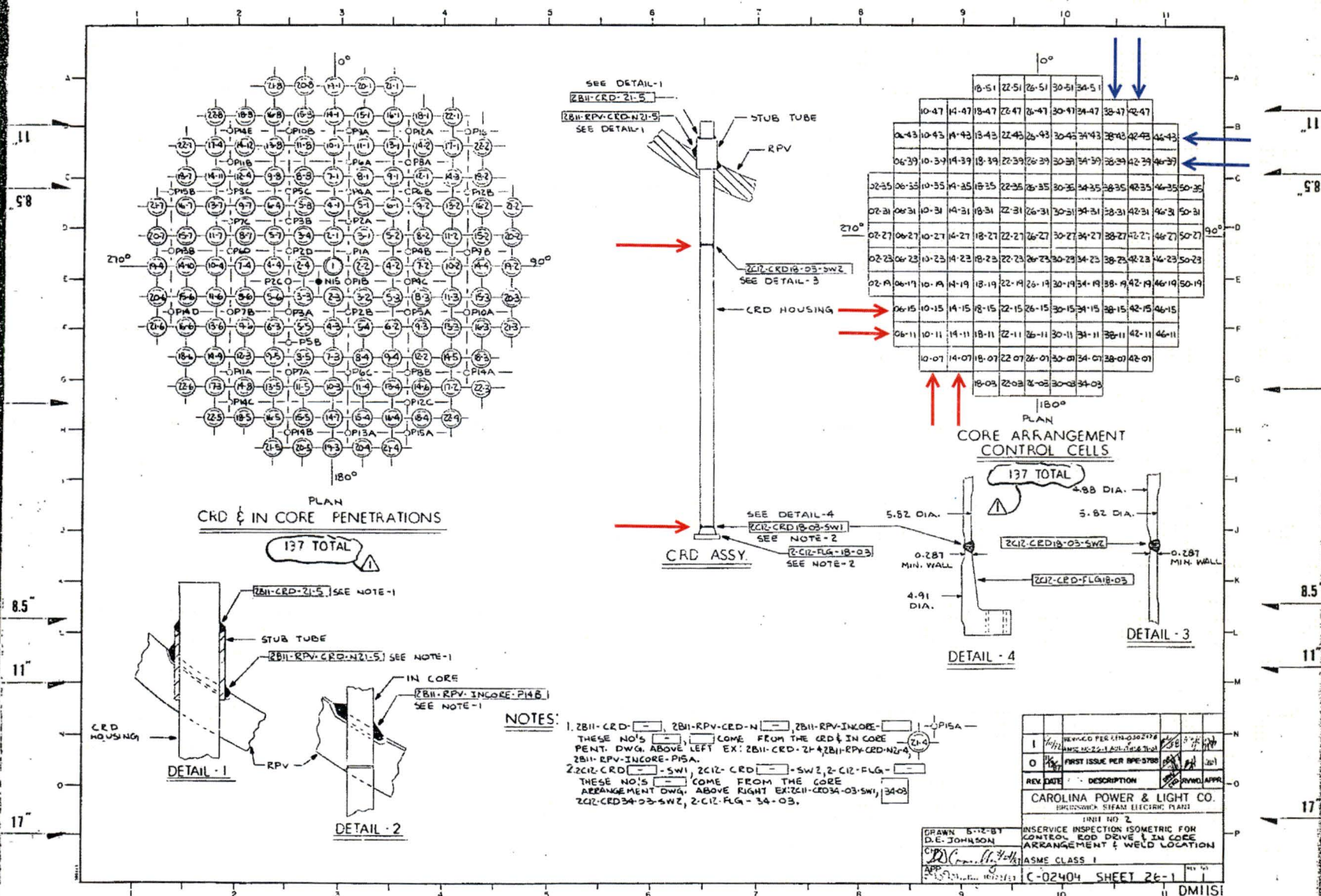
1. Letter for Douglas A. Broaddus (USNRC) to Michael J. Annacone (Carolina Power & Light Company), *Brunswick Steam Electric Plant, Units 1 and 2 – Relief Request Number RR-46 for the Third 10-Year Inservice Inspection Interval* (TAC Nos. ME 1249 and ME 1250), dated April 7, 2010, ADAMS Accession Number ML100491269.
2. Letter from David Terao (USNRC) to Randall K. Edington (Nebraska Public Power District), *Cooper Nuclear Station Re: Fourth 10-Year Interval Inservice Inspection Request for Relief No. RI-15, Examination of Peripheral Control Rod Drive Housing Welds* (TAC No. MD0282), dated October 13, 2006, ADAMS Accession Number ML062620278.
3. Letter from Michael T. Markley (USNRC) to Vice President Operations (Entergy Operations, Inc.), *River Bend Station, Unit 1 - RBS-ISI-016 and RBS-ISI-017 Proposed Alternative to 10 CFR 50.55a Examination Requirements for Reactor Pressure Vessel Weld Inspections* (TAC Nos. ME6845 and ME6844), dated August 31, 2012, ADAMS Accession Number ML12235A308.
4. Letter from Jacob I. Zimmerman (USNRC) to Michael J. Pacilio (Exelon Generation Company, LLC), *Clinton Power Station, Unit No. 1 - Relief Requests (RRs) 4216, 4217, 4218, 4219, 4220, 4221, and 4222 Regarding Examination Coverage for the Second 10-Year Inservice Inspection (ISI) Interval* (TAC Nos. ME4183, ME4184, ME4185, ME4186, ME4187, ME4199, and ME4189), dated June 17, 2011, ADAMS Accession Number ML111100996.

Table 1 Unit 1 Affected Components			
Component ID	ASME Category	ASME Item	Description
1C11-CRD02-19-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD02-19-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD02-23-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD02-23-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD02-27-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD02-27-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD02-31-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD02-31-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD02-35-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD02-35-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD06-11-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD06-11-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD06-15-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD06-15-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD06-39-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD06-39-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD06-43-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD06-43-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD10-07-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD10-07-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD10-47-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD10-47-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD14-07-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD14-07-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD14-47-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD14-47-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD18-03-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD18-03-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD18-51-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD18-51-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD22-03-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD22-03-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD22-51-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD22-51-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD26-03-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD26-03-SW2	B-O	B14.10	CRD Housing Upper Weld

Table 1 Unit 1 Affected Components			
Component ID	ASME Category	ASME Item	Description
1C11-CRD26-51-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD26-51-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD30-03-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD30-03-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD30-51-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD30-51-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD34-03-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD34-03-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD34-51-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD34-51-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD38-07-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD38-07-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD38-47-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD38-47-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD42-07-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD42-07-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD42-47-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD42-47-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD46-11-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD46-11-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD46-15-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD46-15-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD46-39-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD46-39-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD46-43-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD46-43-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD50-19-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD50-19-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD50-23-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD50-23-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD50-27-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD50-27-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD50-31-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD50-31-SW2	B-O	B14.10	CRD Housing Upper Weld
1C11-CRD50-35-SW1	B-O	B14.10	CRD Housing Lower Weld
1C11-CRD50-35-SW2	B-O	B14.10	CRD Housing Upper Weld

Table 2 Unit 2 Affected Components			
Component ID	ASME Category	ASME Item	Description
2C12-CRD02-19-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD02-19-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD02-23-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD02-23-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD02-27-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD02-27-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD02-31-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD02-31-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD02-35-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD02-35-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD06-11-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD06-11-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD06-15-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD06-15-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD06-39-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD06-39-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD06-43-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD06-43-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD10-07-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD10-07-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD10-47-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD10-47-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD14-07-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD14-07-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD14-47-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD14-47-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD18-03-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD18-03-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD18-51-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD18-51-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD22-03-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD22-03-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD22-51-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD22-51-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD26-03-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD26-03-SW2	B-O	B14.10	CRD Housing Upper Weld

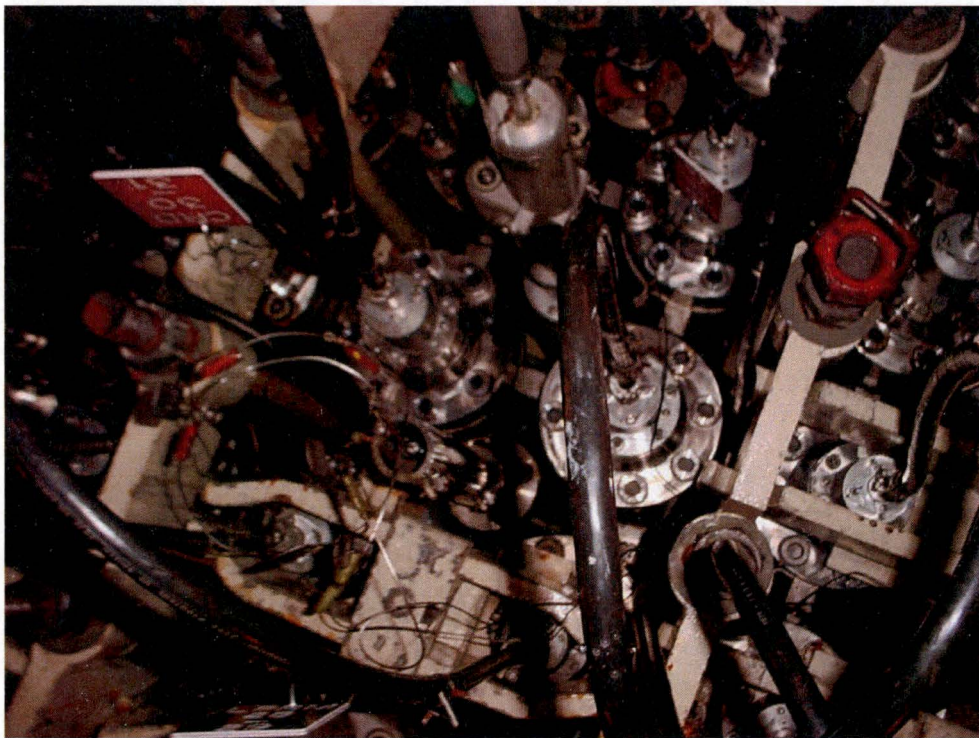
Table 2 Unit 2 Affected Components			
Component ID	ASME Category	ASME Item	Description
2C12-CRD26-51-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD26-51-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD30-03-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD30-03-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD30-51-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD30-51-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD34-03-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD34-03-SW2	B-O	B14.10	CRD Housing Upper Weld
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2C12-CRD38-47-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD42-07-SW1	B-O	B14.10	CRD Housing Lower Weld
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2C12-CRD46-11-SW1	B-O	B14.10	CRD Housing Lower Weld
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2C12-CRD46-39-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD46-39-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD46-43-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD46-43-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD50-19-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD50-19-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD50-23-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD50-23-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD50-27-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD50-27-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD50-31-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD50-31-SW2	B-O	B14.10	CRD Housing Upper Weld
2C12-CRD50-35-SW1	B-O	B14.10	CRD Housing Lower Weld
2C12-CRD50-35-SW2	B-O	B14.10	CRD Housing Upper Weld



Attachment 3



Under-Vessel Area



Under-Vessel Area, Looking Upwards