



August 17, 2011

SBK-L-11164  
Docket No. 50-443

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

**Seabrook Station**

**End of Second 10-Year ISI Interval Relief Requests  
For Examinations With Limited Coverage**


NextEra Energy Seabrook, LLC (NextEra) concluded its second ten-year inservice inspection program on August 18, 2010. During this interval, components identified in Attachments 1 through 4 received less than the required examination coverage. Therefore, pursuant to 10 CFR 50.55a(g)(5)(iii), NextEra requests relief on the basis that the required examination coverage is impractical due to physical obstructions and limitations imposed by design or geometry.

Attachments 1 through 4 contain relief requests and the basis for these requests. The relief requests are specifically identified as 2IR-17, 2IR-18, 2IR-19 and 2IR-20.

If you have any questions regarding this submittal, please contact Mr. Michael O'Keefe, Licensing Manager, at (603) 773-7745.

Sincerely,

NextEra Energy Seabrook, LLC

 *Kenneth J. Browne P.E.  
FOR*  
Paul Freeman  
Site Vice President

A047  
NRK

Attachments

cc: W.M. Dean, NRC Region I Administrator  
G. E. Miller, NRC Project Manager, Project Directorate I-2  
W. J. Raymond, NRC Resident Inspector

**Attachment 1**

Relief Request 2IR-17

Examination Category C-A

Pressure Retaining Welds in Pressure Vessels  
(Limited Exams)

NextEra Energy Seabrook, LLC  
Second Ten-Year Interval  
10 CFR 50.55a Request Number 2IR-17, Rev. 0

**Relief Request  
in Accordance with 10 CFR 50.55a(g)(5)(iii)**

--Inservice Inspection Impracticality--

Sheet 1 of 7

**1. ASME Code Component(s) Affected**

Code Class: 2

Examination Category: C-A, Pressure Retaining Welds in Pressure Vessels

Item Number: C1.10, Shell Circumferential Welds  
C1.30, Tubesheet-to-Shell Welds

Weld Identification: Listed in Table 2IR17-01

**2. Applicable Code Edition and Addenda**

ASME Section XI, 1995 Edition, including Addenda through 1996.

**3. Applicable Code Requirement**

ASME Section XI, 1995 Edition with 1996 Addenda, Examination Category C-A requires volumetric examination of 100 percent of the weld length as defined in Table IWC-2500-1 and shown in Figure IWC-2500-2. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory guide 1.147 Rev. 15, allows credit for essentially 100 percent coverage of the welds provided greater than 90 percent of the required volume has been examined.

**4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100 percent volumetric examination coverage requirement of the subject weld due to geometric configuration, which limits the volumetric examination coverage that can be attained.

Residual Heat Removal Heat Exchanger

The "B" Residual Heat Removal (RH) heat exchanger shell circumferential weld was examined with a manual ultrasonic technique using most recent technology available to achieve maximum examination coverage practical.

Due to original design of the heat exchanger, the lower shell circumferential weld is in close proximity to the flange joining the lower heat exchanger shell to the upper shell, thereby limiting ultrasonic examination coverage from the tubesheet side of the weld.

**Containment Building Spray Heat Exchanger**

The "B" Containment Building Spray (CBS) heat exchanger tubesheet-to-shell weld was examined with a manual ultrasonic technique using most recent technology available to achieve maximum examination coverage practical.

Due to original design of the heat exchanger, the tubesheet-to-shell weld is in close proximity to the flange joining the heat exchanger shell side to the tubesheet side, thereby limiting ultrasonic examination coverage from the tubesheet side of the weld. Further examination limitations exist from support gusset plates welded on each side of the tubesheet shell.

Limitation sketches are provided in Figures 2IR-17-01 and 2IR-17-02.

**5. Burden Caused by Compliance**

**Residual Heat Removal Heat Exchanger**

To increase examination coverage on the RHR heat exchanger lower shell circumferential weld, the heat exchanger would require replacement with a design that would allow for complete examination coverage of the subject weld. This option to meet the 100 percent examination requirement is considered impractical.

**Containment Building Spray Heat Exchanger**

To increase examination coverage on the CBS heat exchanger tubesheet-to-shell weld, removal of the permanently welded support gusset plates that are part of the original heat exchanger design or replacement of the heat exchanger with a design that would allow for complete examination coverage of the subject weld would be required. These options to meet the 100 percent examination coverage requirement are considered impractical.

**6. Proposed Alternative And Basis for Use**

There are no alternative examinations proposed. The subject welds received a volumetric examination to the maximum extent practical utilizing best available techniques on accessible portions of the weld to the extent practical. Additionally, a visual (VT-2) examination is performed each refueling outage during the system leakage test as required by Section XI, Table IWC-2500-1, Category C-H, All Pressure Retaining Components.

Based on the volumetric examination coverage attained with acceptable results along with the visual (VT-2) examination performed each refueling outage with acceptable results, it is reasonable to conclude that service induced degradation would be detected, which provides an acceptable level of quality and safety for the subject welds.

**7. Duration of Proposed Alternative**

Relief is requested for the second 10-year inspection interval for Seabrook Station, which began on August 19, 2000 and ended on August 18, 2010.

**8. Precedents**

Similar relief requests documenting limited examinations have been granted to the following plants:

- NRC to Dominion Nuclear Connecticut, Inc. letter, "Millstone Power Station, Unit No. 3 – Issuance of Relief Requests IR-2-51 Through IR-2-60 Regarding Second 10-Year Interval Inservice Inspection Program Plan (TAC. Nos. ME3809 Through ME3818)", dated April 26, 2011
- NRC to Virginia Electric and Power Company letter, "North Anna Power Station, Unit No. 1, Third 10-Year Inservice Inspection Interval Program, Relief Request N1-I3-PRT-004, Part A Through Part G (TAC Nos. ME3333, ME5136, ME5137, ME5138, ME5139, ME5140 and ME5141)", dated January 7, 2011

**9. References**

- ADAMS Accession Number: ML110691154
- ADAMS Accession Number: ML110060011

**Table 2IR-17-01**  
**Examination Category C-A, Pressure Retaining Welds in Pressure Vessels**

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
RH E-9B 01B	C1.10	"B" RHR Heat Exchanger Shell Circumferential Weld	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the shell side due to close proximity of the flange to the weld. No service related flaws were detected.
CBS E-16B 01	C1.30	"B" CBS Heat Exchanger Tubesheet-to-Shell Weld	19%	45° 60°	Shear Wave Longitudinal Wave	Two limitations exist, the weld is in close proximity to the flange, which limits scanning from the shell side of the weld and welded support attachments, which prohibit access to the weld in those locations. No service related flaws were detected.

**Table 2IR-17-02**  
**Examination Category C-A, Pressure Retaining Welds in Pressure Vessels**  
**Base Material and Thickness**

<b>Heat Exchanger ISI Weld ID</b>	<b>Base Material</b>	<b>Thickness</b>
RH E-9B 01B	SA240/TP304	0.875 inches
CBS E-16B 01	SA240/TP304	0.625 inches



Figure 2IR-17-01  
Residual Heat (RH) Heat Exchanger 1-RH-E-9B Circumferential Weld Detail  
(Exam Limitation)

Sheet 6 of 7

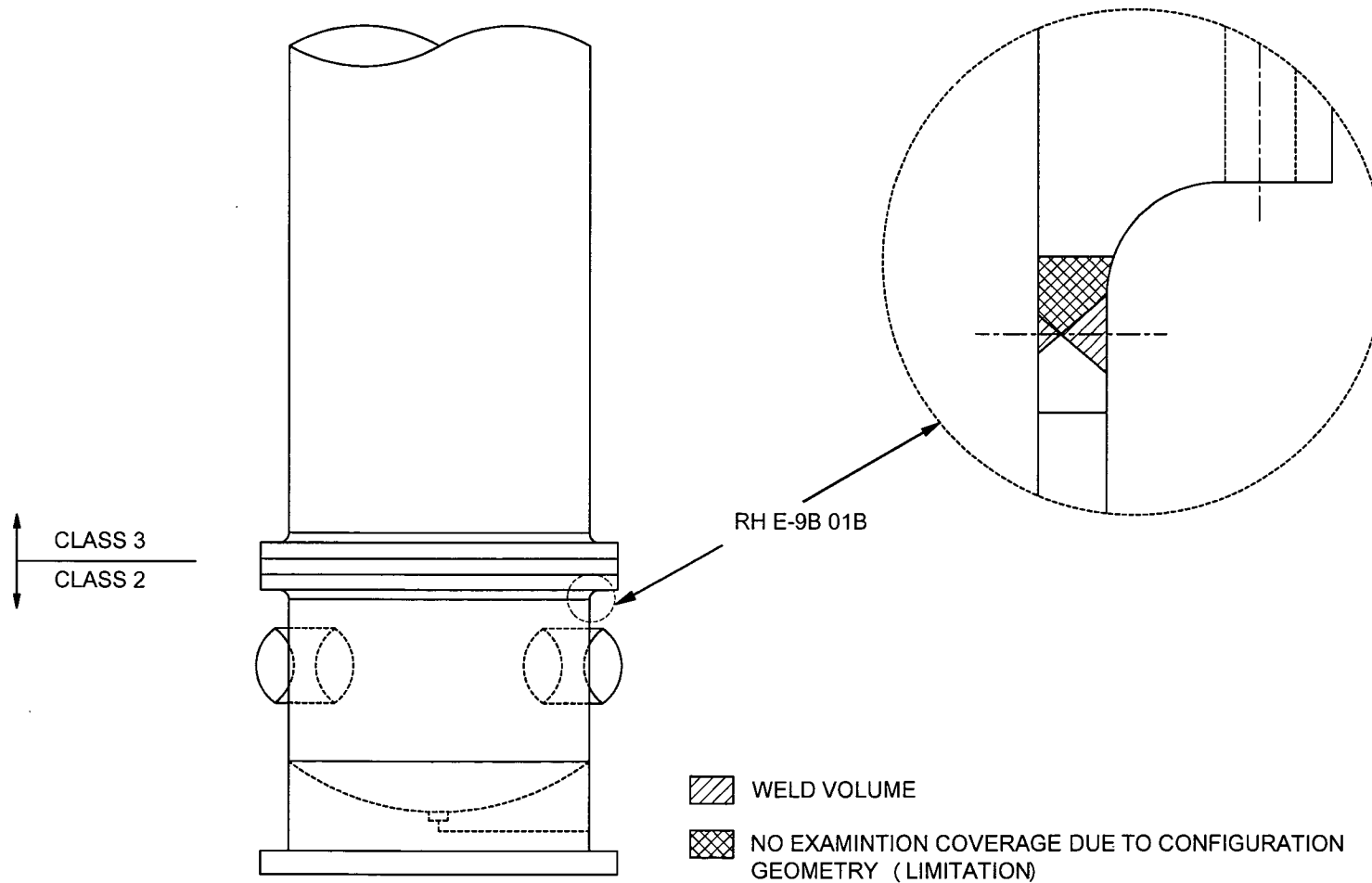
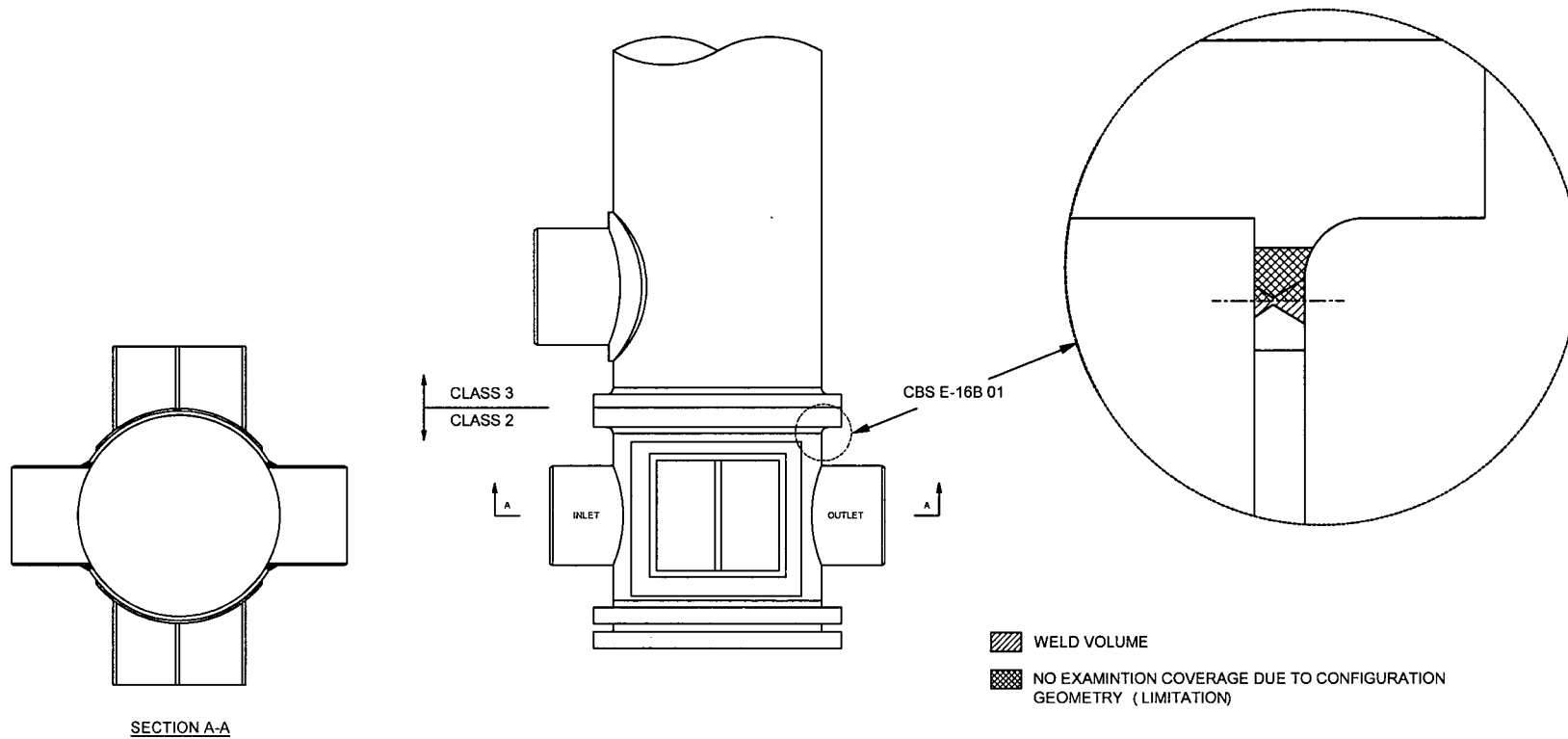


Figure 2IR-17-02  
Containment Building Spray (CBS) Heat Exchanger 1-CBS-E-16B Tubesheet-to-Shell Weld  
(Exam Limitation)

Sheet 7 of 7



**Attachment 2**

Relief Request 2IR-18

Examination Category C-B

Pressure Retaining Nozzle Welds in Vessels  
(Limited Exams)

NextEra Energy Seabrook, LLC  
Second Ten-Year Interval  
10 CFR 50.55a Request Number 2IR-18, Rev. 0

**Relief Request  
in Accordance with 10 CFR 50.55a(g)(5)(iii)**

--Inservice Inspection Impracticality--

Sheet 1 of 6

**1. ASME Code Component(s) Affected**

Code Class: 2

Examination Category: C-B, Pressure Retaining Nozzle Welds in Vessels

Item Number: C2.21, Nozzles Without Reinforcing Plate in Vessels > ½ in. Nominal Thickness, Nozzle-to-Shell (or Head) Weld

Weld Identification: Listed in Table 2IR-18-01

**2. Applicable Code Edition and Addenda**

ASME Section XI, 1995 Edition, including Addenda through 1996.

**3. Applicable Code Requirement**

ASME Section XI, 1995 Edition with 1996 Addenda, Examination Category C-B requires volumetric and surface examination of 100 percent of nozzle welds as defined in Table IWC-2500-1 and shown in Figure IWC-2500-4(a) or (b). The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory guide 1.147 Rev. 15, allows credit for essentially 100 percent coverage of the welds provided greater than 90 percent of the required volume has been examined.

**4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100 percent volumetric examination coverage requirement of the subject welds due to geometric configuration, which limits the volumetric examination coverage that can be attained.

The “B” Containment Building Spray (CBS) heat exchanger inlet and outlet nozzle-to-shell welds were examined with a manual ultrasonic technique using most recent technology available to achieve maximum examination coverage practical. Examination coverage of the inlet and outlet nozzle-to-shell welds is limited because of single sided access due to nozzle-to-shell weld configuration.

Limitation sketch provided in Figure 2IR-18-01.

Table 2IR-18-02 provides base material and thickness data.

**5. Burden Caused by Compliance**

To increase examination coverage on the CBS heat exchanger nozzle-to-shell welds would require extensive modification or replacement of the heat exchanger with a design that would allow for complete examination coverage of the subject welds. This option to meet the 100 percent examination coverage requirement is considered impractical.

**6. Proposed Alternative And Basis for Use**

The subject welds received a volumetric examination to the maximum extent practical utilizing best available techniques on accessible portions of the weld to the extent practical. The subject welds received a surface examination meeting requirements specified in Section XI, Table IWC-2500-1, Category C-B. Additionally, a visual (VT-2) examination was performed each refueling outage during the system leakage test as required by Section XI, Table IWC-2500-1, Category C-H.

Based on the volumetric examination coverage attained with acceptable results, 100% surface examination coverage attained with acceptable results and the visual (VT-2) examination performed each refueling outage with acceptable results, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

**7. Duration of Proposed Alternative**

Relief is requested for the second 10-year inspection interval for Seabrook Station, which began on August 19, 2000 and ended on August 18, 2010.

**8. Precedents**

Similar relief requests have been granted to the following plants:

- NRC to Dominion Nuclear Connecticut, Inc. letter, “Millstone Power Station, Unit No. 3 – Issuance of Relief Requests IR-2-51 Through IR-2-60 Regarding Second 10-Year Interval Inservice Inspection Program Plan (TAC. Nos. ME3809 Through ME3818)”, dated April 26, 2011
- NRC to Virginia Electric and Power Company letter, “North Anna Power Station, Unit No. 1, Third 10-Year Inservice Inspection Interval Program, Relief Request N1-I3-PRT-004, Part A Through Part G (TAC Nos. ME3333, ME5136, ME5137, ME5138, ME5139, ME5140 and ME5141)”, dated January 7, 2011

**9. References**

- ADAMS Accession Number: ML110691154
- ADAMS Accession Number: ML110060011

**Table 2IR-18-01**  
**Examination Category C-B, Pressure Retaining Nozzle Welds in Vessels**

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
CBS E-16 N1	C2.21	“B” CBS Heat Exchanger Nozzle-to-Shell Weld	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the shell side due to nozzle-to-shell weld configuration. No service related flaws were detected.
CBS E-16B N2	C2.21	“B” CBS Heat Exchanger Nozzle-to-Shell Weld	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the shell side due to nozzle-to-shell weld configuration. No service related flaws were detected.

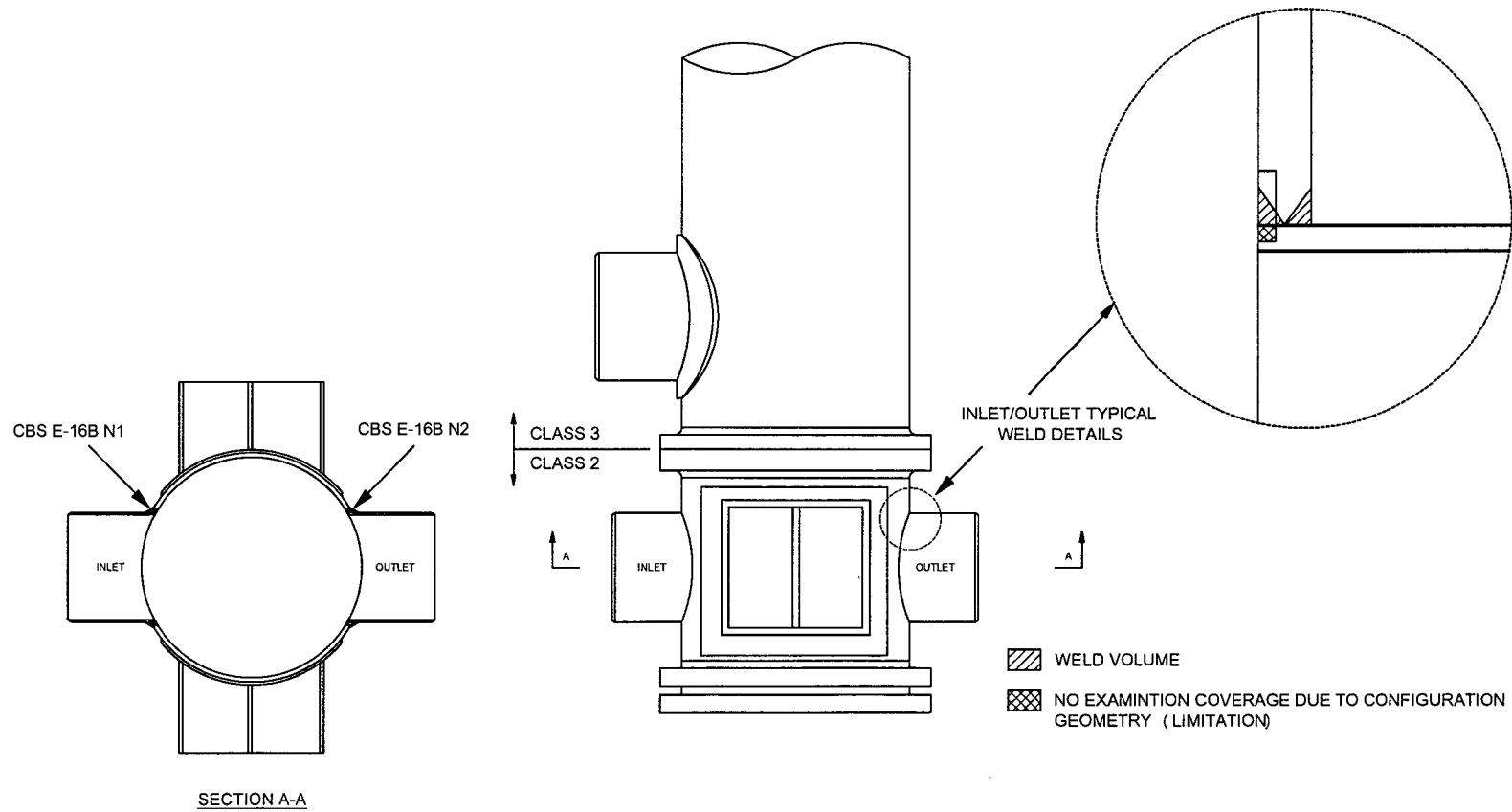
**Table 2IR-18-02**  
**Examination Category C-B, Pressure Retaining Nozzle Welds in Vessels**  
**Base Material and Thickness**

Heat Exchanger ISI Weld ID	Base Material		Thickness	
CBS E-16 N1	Shell: SA240/TP304	Nozzle: SA312/TP304	Shell: 0.625 inches	Nozzle: 0.438 inches
CBS E-16B N2	Shell: SA240/TP304	Nozzle: SA312/TP304	Shell: 0.625 inches	Nozzle: 0.438 inches



Figure 2IR-18-01  
Containment Building Spray (CBS) Heat Exchanger 1-CBS-E-16B Nozzle Welds  
(Exam Limitations)

Sheet 6 of 6



**Attachment 3**

Relief Request 2IR-19

Examination Category C-F-1

Class 2 Stainless Steel Piping Limited Exams  
(Limited Exams)

NextEra Energy Seabrook, LLC  
Second Ten-Year Interval  
10 CFR 50.55a Request Number 2IR-19, Rev. 0

**Relief Request  
in Accordance with 10 CFR 50.55a(g)(5)(iii)**

--Inservice Inspection Impracticality--

Sheet 1 of 12

**1. ASME Code Component(s) Affected**

Code Class: 2

Examination Category: C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping

Item Number: C5.11, Piping Welds > 3/8 in. Nominal Wall Thickness for Piping > NPS 4 in. – Circumferential Welds  
C5.21, Piping Welds > 1/5 in. Nominal Wall Thickness for Piping ≥ 2 in. and ≤ 4 in. – Circumferential Welds

Number of Affected Welds: Listed in Table 2IR-19-01

**2. Applicable Code Edition and Addenda**

ASME Section XI, 1995 Edition, including Addenda through 1996.

Austenitic piping welds with single side access subject to ultrasonic examination with Supplement 2 of Appendix VIII to the 1995 Edition with 1996 Addenda of ASME Section XI.

**3. Applicable Code Requirement**

ASME Section XI, 1995 Edition with 1996 Addenda, Examination Category C-F-1 requires 100 percent volumetric and surface examination coverage for circumferential piping welds as defined in Table IWC-2500-1 and shown in Figure IWC-2500-7.

The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory guide 1.147 Rev. 15, allows credit for essentially 100 percent coverage of the welds provided greater than 90 percent of the required volume has been examined.

10 CFR 50.55a(b)(2)(xv)(A) requires the following examination coverage when applying Supplement 2 to Appendix VIII:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single side Appendix VIII demonstration using flaws on the opposite side of the weld.

10 CFR 50.55a (b)(2)(xvi)(B) requires that examinations performed from one side of a stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and paragraph 50.55a(b)(2)(xv)(A).

#### **4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100 percent volumetric examination coverage requirement for austenitic piping welds with single side access. Surface examinations met ASME Code requirements with no unacceptable indications recorded.

There are currently no Performance Demonstration Initiative (PDI) qualified single side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld.

PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single side qualification to demonstrate that the examiners qualification and the subsequent weld examination is based on application of the best available technology.

Relief is requested from compliance with the 100 percent required examination coverage for piping welds listed in Table 2IR-19-01 based on configurations limited to single side access. Examination coverage listed was obtained during examination with no credit taken for the far side of each weld.

Table 2IR-19-02 provides base and weld materials for welds listed in Table 2IR-19-01.

Limitation sketch provided for specific weld CS 371-03 08 in Figure 2IR-19-01.

Generic limitation sketch provided in Figure 2IR-19-02.

**5. Burden Caused by Compliance**

Compliance would require extensive modification or replacement of components with a design that allows examination from both sides of the weld. This option to meet the 100 percent examination coverage requirement is considered impractical.

**6. Proposed Alternative And Basis for Use**

The subject welds received a volumetric examination to the maximum extent practical utilizing best available techniques, as qualified through the Performance Demonstration Initiative (PDI) for Supplement 2 with demonstrated best effort for single side examination, from the accessible side of the weld. The subject welds received a surface examination meeting requirements specified in Section XI, Table IWC-2500-1, Category C-F-1. Additionally, a visual (VT-2) examination performed each refueling outage during the system leakage test as required by Section XI, Table IWC-2500-1, Category C-H.

Based on the volumetric examination coverage attained with acceptable results, 100% surface examination coverage attained with acceptable results and the visual (VT-2) examination performed each refueling outage with acceptable results, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

**7. Duration of Proposed Alternative**

Relief is requested for the second 10-year inspection interval for Seabrook Station, which began on August 19, 2000 and ended on August 18, 2010.

**8. Precedents**

Similar relief requests have been granted to the following plants:

- NRC to Dominion Nuclear Connecticut, Inc. letter, "Millstone Power Station, Unit No. 3 – Issuance of Relief Requests IR-2-51 Through IR-2-60 Regarding Second 10-Year Interval Inservice Inspection Program Plan (TAC. Nos. ME3809 Through ME3818)", dated April 26, 2011
- NRC to Virginia Electric and Power Company letter, "North Anna Power Station, Unit No. 1, Third 10-Year Inservice Inspection Interval Program, Relief Request N1-I3-PRT-004, Part A Through Part G (TAC Nos. ME3333, ME5136, ME5137, ME5138, ME5139, ME5140 and ME5141)", dated January 7, 2011

**9. References**

- ADAMS Accession Number: ML110691154
- ADAMS Accession Number: ML110060011

**Table 2IR-19-01**  
**Examination Category C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping**  
**Coverage Limitations and UT Parameters**

Sheet 5 of 12

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
CBS 1207-02 02	C5.11	12" Pipe-to-Valve	50%	45° and 60°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CBS 1208-03 01	C5.11	10" Reducer-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the reducer taper to the weld. No service related flaws were detected.
CBS 1209-01 02	C5.11	12" Pipe-to-Valve	50%	45° and 60° 70°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CBS 1212-16 10	C5.11	16" Pipe-to-Valve	49%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CBS 1214-02 21	C5.11	8" Valve-to-Penetration	50%	45°, 60° and 70°	Shear Wave	Limited examination from the penetration side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CBS 1215-01 01	C5.11	6" Flange-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the flange to the weld. No service related flaws were detected.
CBS 1216-02 20	C5.11	8" Pipe-to-Valve	50%	45°, 60° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.

CS 0324-01 01	C5.21	3" Pipe-to-Valve	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0324-01 02	C5.21	3" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.



**Table 2IR-19-01**  
**Examination Category C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping**  
**Coverage Limitations and UT Parameters**

Sheet 6 of 12

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
CS 0355-01 01	C5.21	3" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0355-01 04	C5.21	3" Pipe-to-Valve	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0355-06 01	C5.21	3" Pipe-to-Valve	50%	45°, 60° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0362-01 02	C5.21	4" Valve-to-Pipe	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0364-01 01	C5.21	4" Flange-to-Pipe	50%	45° and 60° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the flange to the weld. No service related flaws were detected.
CS 0364-02 01	C5.21	3" Pipe-to-Valve	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0369-03 08	C5.21	8" Pipe-to-Valve	50%	45°, 60° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.

CS 0371-03 08	C5.21	6" Elbow-to-Pipe	65%	45° and 70°	Shear Wave	Weld crown width limited coverage for circumferential scans. No recordable indications were detected.
CS 0374-01 02	C5.21	4" Flange-to-Pipe	50%	45° and 70° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the flange to the weld. No service related flaws were detected.

**Table 2IR-19-01**  
**Examination Category C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping**  
**Coverage Limitations and UT Parameters**

Sheet 7 of 12

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
CS 0375-01 04	C5.21	3" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RC 0013-04 10	C5.11	14" Pipe-to-Safe end	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the nozzle taper to the weld. No service related flaws were detected.
RH 0152-01 03	C5.11	8" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RH 0155-02 32	C5.11	8" Pipe-to-Valve	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RH 0159-01 14	C5.11	8" Pipe-to-Valve	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RH 0162-04 02	C5.11	6" Pipe-to-Flange	50%	45° and 60° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the flange to the weld. No service related flaws were detected.
RH 0163-05 04	C5.11	6" Flange-to-Pipe	50%	45° and 60° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the flange to the weld. No service related flaws were detected.

RH 0180-01 01	C5.11	8" Tee-to-Pipe	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the tee fitting taper to the weld. No service related flaws were detected.
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**Table 2IR-19-01**  
**Examination Category C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping**  
**Coverage Limitations and UT Parameters**

Sheet 8 of 12

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
SI 0250-02 07	C5.21	4" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
SI 0250-03 01	C5.21	4" Valve-to-Pipe	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
SI 0250-03 04	C5.21	4" Pipe-to-Tee	50%	45° 70°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the tee fitting taper to the weld. No service related flaws were detected.
SI 0251-02 08	C5.21	4" Pipe-to-Flange	50%	45°, 60° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the flange to the weld. No service related flaws were detected.
SI 0251-03 01	C5.21	4" Pipe-to-Valve	50%	45° and 60° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
SI 0256-01 02	C5.21	4" Valve-to-Pipe	50%	45°, 60° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
SI 0257-01 02	C5.21	4" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.

SI 0272-02 10	C5.21	4" Valve-to-Pipe	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
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**Table 2IR-19-02**  
**Examination Category C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping**  
**Base and Weld Materials**

Sheet 9 of 12

ISI Weld ID	Base Material		Weld Material
CBS 1207-02 02	Pipe: SA312/F316	Valve: SA182/F316	ER308 and E308
CBS 1208-03 01	Pipe: SA312/F316	Reducer: SA403/WP304	Construction supplied piping spool that includes weld
CBS 1209-01 02	Pipe: SA312/F316	Valve: SA182/F316	87DCR311
CBS 1212-16 10	Pipe: SA358/TP304Cl.1	Valve: SA182/F316	ER308 and E308
CBS 1214-02 21	Valve: SA351/Gr CF3M	Pipe: SA312/TP304	ER308 and E308
CBS 1215-01 01	Flange: SA182/F304	Pipe: SA312/TP304	Construction supplied piping spool that includes weld
CBS 1216-02 20	Pipe: SA182/TP304	Valve: SA351/Gr CF3M	ER308 and E308
CS 0324-01 01	Pipe: SA376/TP316	Valve: SA182/F316	ER308 and E308
CS 0324-01 02	Valve: SA182/F316	Pipe: SA376/TP316	ER308 and E308
CS 0355-01 01	Valve: SA182/F316	Pipe: SA376/TP316	ER316/E316
CS 0355-01 04	Pipe: SA376/TP316	Valve: SA182/F316	ER316/E316
CS 0355-06 01	Pipe: SA376/TP316	Valve: SA182/F316	ER316/E316
CS 0362-01 02	Valve: SA182/F316	Pipe: SA376/TP316	ER316/E316
CS 0364-01 01	Flange: SA182/F316	Pipe: SA376/TP316	Construction supplied piping spool that includes weld
CS 0364-02 01	Pipe: SA376/TP316	Valve: SA182/F304	ER308 and E308
CS 0369-03 08	Pipe: SA312/TP304	Valve: SA182/F304	ER308 and E308
CS 0371-03 08	Elbow: SA403/WP304	Pipe: SA312/TP304	Construction supplied piping spool that includes weld

Sheet 9a			
CS 0374-01 02	Flange: SA182/F316	Pipe: SA376/TP316	Construction supplied piping spool that includes weld



**Table 2IR-19-02**  
**Examination Category C-F-1 Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping**  
**Base and Weld Materials**

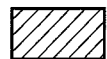
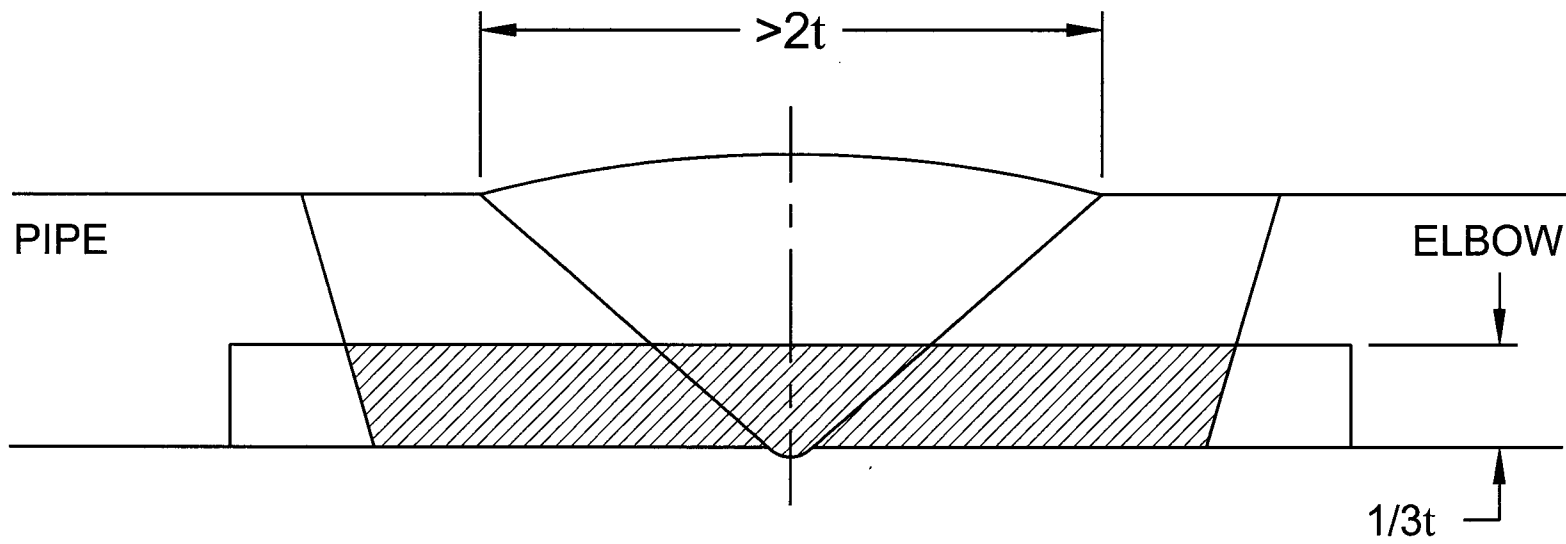
Sheet 10 of 12

ISI Weld ID	Base Material		Weld Material
CS 0375-01 04	Valve: SA182/F316	Pipe: SA312/TP304	ER308 and E308
RC 0013-04 10	Pipe: SA358/TP304Cl.1	Nozzle: SA182/F304	ER308 and E308
RH 0152-01 03	Valve: SA351/Gr CF3M	Pipe: SA312/TP304	Construction supplied piping spool that includes weld
RH 0155-02 32	Pipe: SA312/TP304	Valve: SA182/F316	ER308 and E308
RH 0159-01 14	Pipe: SA312/TP304	Valve: SA182/F316	ER308 and E308
RH 0162-04 02	Pipe: SA376/TP316	Flange: SA182/F316	ER316/E316
RH 0163-05 04	Flange: SA182/F316	Pipe: SA376/TP316	ER316/E316
RH 0180-01 01	Tee: SA403/WP304	Pipe: SA376/TP316	ER316/E316
SI 0250-02 07	Valve: SA182/F316	Pipe: SA312/TP304	ER308 and E308
SI 0250-03 01	Valve: SA182/F316	Pipe: SA312/TP304	ER308 and E308
SI 0250-03 04	Pipe: SA376/TP316	Tee: SA403/WP316	Construction supplied piping spool that includes weld
SI 0251-02 08	Pipe: SA312/TP304	Flange: SA182/F304	Construction supplied piping spool that includes weld
SI 0251-03 01	Pipe: SA312/TP304	Valve: SA312/F316	ER316/E316
SI 0256-01 02	Valve: SA182/F316	Pipe: SA312/TP304	ER308 and E308
SI 0257-01 02	Valve: SA182/F316	Pipe: SA312/TP304	ER308 and E308
SI 0272-02 10	Valve: SA182/F316	Pipe: SA376/TP316	ER316/E316

Figure 2IR-19-01  
Examination Coverage Limitation for Weld CS 0371-03 08

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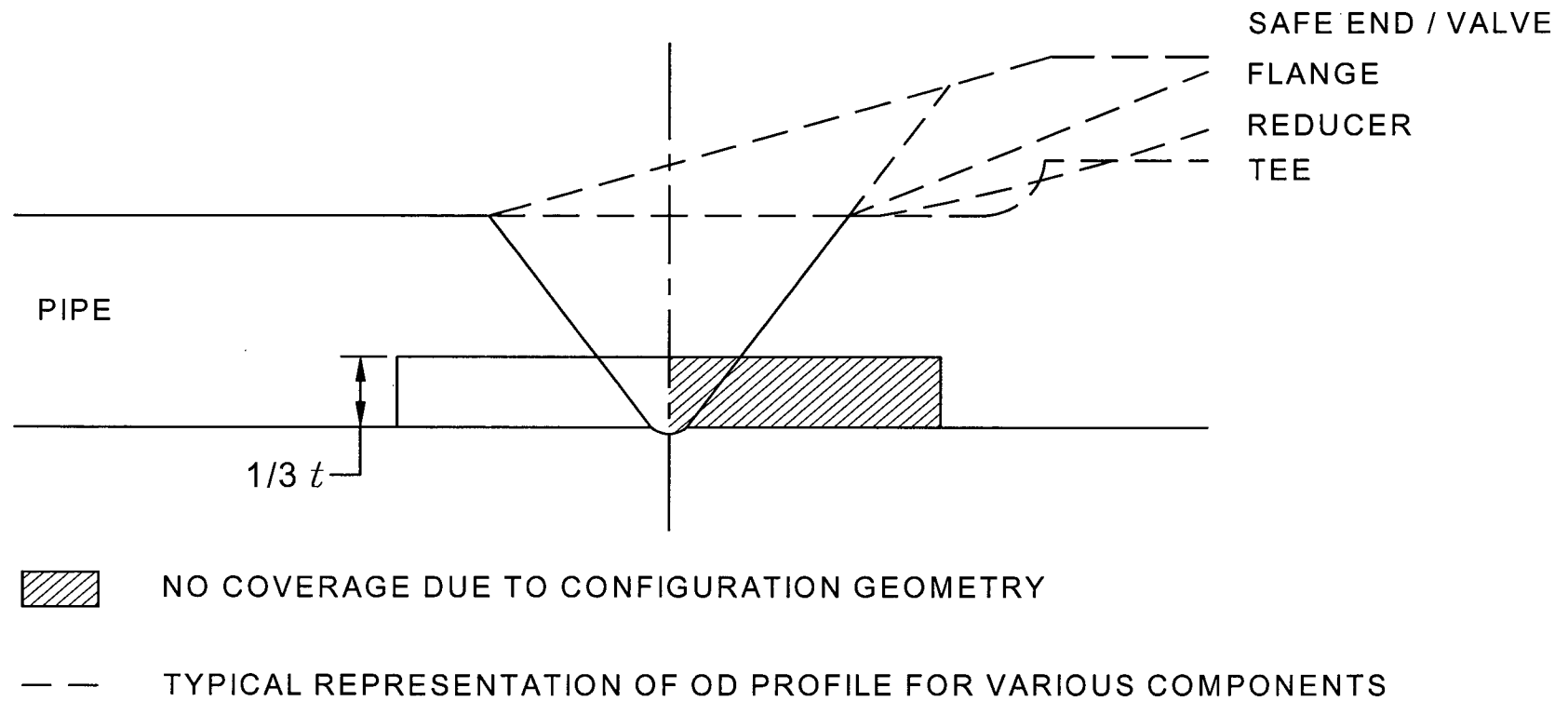
CS 0371-03 08



NO CIRC SCAN COVERAGE DUE TO WELD GEOMETRY

Figure 2IR-19-02  
Typical OD Profile Representing Various Components  
(Exam Limitation)

Sheet 12 of 12



**Attachment 4**

Relief Request 2IR-20

Examination Category R-A  
Class 1 Stainless Steel Piping Limited Exams  
(Limited Exams)

NextEra Energy Seabrook, LLC  
Second Ten-Year Interval  
10 CFR 50.55a Request Number 2IR-20, Rev. 0

**Relief Request  
in Accordance with 10 CFR 50.55a(g)(5)(iii)**

--Inservice Inspection Impracticality--

Sheet 1 of 7

**1. ASME Code Component(s) Affected**

Code Class: 1  
Examination Category: R-A, Risk Informed Piping Examinations  
Item Number: R1.11, Elements Subject to Thermal Fatigue  
R1.16, Elements Subject to Intergranular Stress Corrosion Cracking  
R1.20, Elements Not Subject to a Damage Mechanism  
Number of Affected Welds: Listed in Table 2IR-20-01

**2. Applicable Code Edition and Addenda**

ASME Section XI, 1995 Edition, including Addenda through 1996 (Reference 1).

Austenitic piping welds with single side access subject to ultrasonic examination with Supplement 2 of Appendix VIII to the 1995 Edition with 1996 Addenda of ASME Section XI.

**3. Applicable Code Requirement**

The examination requirements for Class 1 piping welds are governed by the Risk-Informed Inservice Inspection (RI-ISI) program that was approved by the NRC in a Safety Evaluation dated February 7, 2002 per TAC No. MB1799. The RI-ISI program was developed in accordance with EPRI Topical Report TR-112657 Rev. B-A, Revised Risk-Informed Inservice Inspection Evaluation Procedure. The RI-ISI program was also implemented in a manner consistent with ASME Code Case N-578, Risk-Informed Requirements for Class 1, 2 and 3 Piping, Method B. ASME Code Case N-578 requires that 100% of the weld be examined.

The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory guide 1.147 Rev. 15, allows credit for essentially 100 percent coverage of the welds provided greater than 90 percent of the required volume has been examined.

10 CFR 50.55a(b)(2)(xv)(A) requires the following examination coverage when applying Supplement 2 to Appendix VIII:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single side Appendix VIII demonstration using flaws on the opposite side of the weld.

10 CFR 50.55a (b)(2)(xvi)(B) requires that examinations performed from one side of a stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and paragraph 50.55a(b)(2)(xv)(A).

#### **4. Impracticality of Compliance**

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100 percent volumetric examination coverage requirement for austenitic piping welds with single side access.

There are currently no Performance Demonstration Initiative (PDI) qualified single side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld.

PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single side qualification to demonstrate that the examiners qualification and the subsequent weld examination is based on application of the best available technology.

Relief is requested from compliance with the 100 percent required examination coverage for piping welds listed in Table 2IR-20-01 based on configurations limited to single side access. Examination coverage listed was obtained during examination with no credit taken for the far side of each weld.

Table 2IR-20-02 provides base and weld materials for welds listed in Table 2IR-20-01.

Generic limitation sketch provided in Figure 2IR-20-01.

#### **5. Burden Caused by Compliance**

Compliance would require extensive modification or replacement of components with a design that allows examination from both sides of the weld. This option to meet the 100 percent examination coverage requirement is considered impractical.

**6. Proposed Alternative And Basis for Use**

The subject welds received a volumetric examination to the maximum extent practical utilizing best available techniques, as qualified through the Performance Demonstration Initiative (PDI) for Supplement 2 with demonstrated best effort for single side examination, from the accessible side of the weld. Additionally, a visual (VT-2) examination performed each refueling outage during the system leakage test as required by Section XI, Table IWB-2500-1, Category B-P, All Pressure Retaining Components.

Based on the volumetric examination coverage attained with acceptable results, and the visual (VT-2) examination performed each refueling outage with acceptable results, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

**7. Duration of Proposed Alternative**

Relief is requested for the second 10-year inspection interval for Seabrook Station, which began on August 19, 2000 and ended on August 18, 2010.

**8. Precedents**

Similar relief requests have been granted to the following plants:

- NRC to Dominion Nuclear Connecticut, Inc. letter, "Millstone Power Station, Unit No. 3 – Issuance of Relief Requests IR-2-51 Through IR-2-60 Regarding Second 10-Year Interval Inservice Inspection Program Plan (TAC. Nos. ME3809 Through ME3818)", dated April 26, 2011
- NRC to Virginia Electric and Power Company letter, "North Anna Power Station, Unit No. 1, Third 10-Year Inservice Inspection Interval Program, Relief Request N1-I3-PRT-004, Part A Through Part G (TAC Nos. ME3333, ME5136, ME5137, ME5138, ME5139, ME5140 and ME5141)", dated January 7, 2011

**9. References**

- ADAMS Accession Number: ML110691154
- ADAMS Accession Number: ML110060011

**Table 2IR-20-01**  
**Examination Category R-A Risk Informed Piping Examinations**

Sheet 4 of 7

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
CS 0329-04 04	R1.20	2" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0366-02 04	R1.11	3" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
CS 0368-02 04	R1.11	3" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RC 0013-01 08	R1.11	12" Pipe-to-Tee	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the tee fitting taper to the weld. No service related flaws were detected.
RC 0013-01 09	R1.11	12" Tee-to-Pipe	50%	45° 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the tee fitting taper to the weld. No service related flaws were detected.
RC 0048-03 01	R1.11	4" Reducer-to-Pipe	50%	45° 70°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the reducer taper to the weld. No service related flaws were detected.



RC 0048-03 06	R1.11	4" Pipe-to-Safe end	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the nozzle taper to the weld. No service related flaws were detected.
RC 0080-02 10	R1.11	3" Pipe-to-Valve	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.

**Table 2IR-20-01**  
**Examination Category R-A Risk Informed Piping Examinations**

Sheet 5 of 7

ISI Weld ID	Item Number	Configuration	Coverage	Angle	Mode	Comments
RC 0080-06 10	R1.11	3" Pipe-to-Valve	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RC 0097-01 08	R1.20	3" Valve-to-Pipe	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RC 0097-01 11	R1.20	3" Pipe-to-Valve	50%	45° and 70°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
RH 0180-05 02	R1.11	12" Pipe-to-Tee	50%	45° and 60°	Shear Wave	Limited examination from the pipe side only due to close proximity of the tee fitting taper to the weld. No service related flaws were detected.
SI 0202-02 17	R1.11	10" Valve-to-Pipe	50%	45° and 60°	Shear Wave Longitudinal Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
SI 0251-07 04	R1.16	6" Pipe-to-Valve	50%	45° and 60°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.
SI 0251-07 05	R1.20	6" Valve-to-Pipe	50%	45° and 60°	Shear Wave	Limited examination from the pipe side only due to close proximity of the valve taper to the weld. No service related flaws were detected.

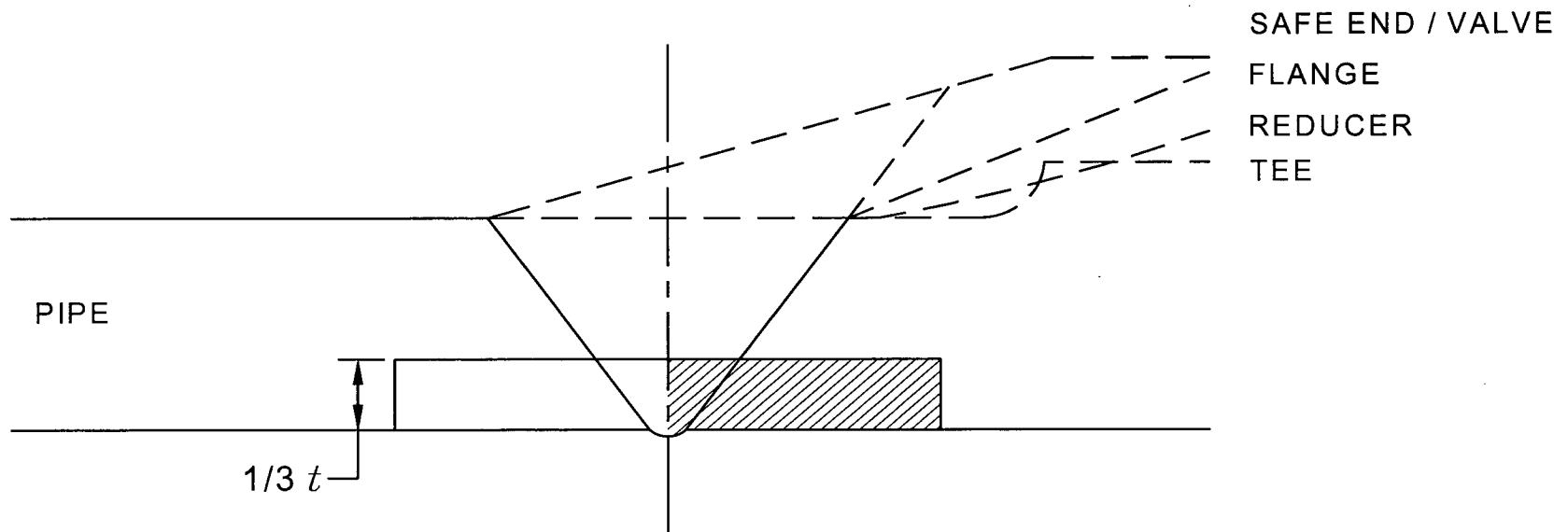
**Table 2IR-20-02**  
**Examination Category R-A Risk Informed Piping Examinations**  
**Base and Weld Materials**

Sheet 6 of 7

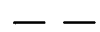
ISI Weld ID	Base Material		Weld Material
CS 0329-04 04	Valve: SA182/F316	Pipe: SA376/TP316	ER316/E316
CS 0366-02 04	Valve: SA182/F316	Pipe: SA376/TP316	ER316/E316
CS 0368-02 04	Valve: SA182/F316	Pipe: SA376/TP316	ER316/E316
RC 0013-01 08	Pipe: SA376/TP316	Tee: SA403/WP316	Construction supplied piping spool that includes weld
RC 0013-01 09	Tee: SA403/WP316	Pipe: SA376/TP316	Construction supplied piping spool that includes weld
RC 0048-03 01	Reducer: SA403/WP316	Pipe: SA376/TP316	ER316/E316
RC 0048-03 06	Pipe: SA376/TP316	Nozzle: SA182/F316	ER316/E316
RC 0080-02 10	Pipe: SA376/TP316	Valve: SA182/F316	ER316/E316
RC 0080-06 10	Pipe: SA376/TP316	Valve: SA182/F316	ER316/E316
RC 0097-01 08	Valve: SA182/F304	Pipe: SA376/TP316	ER316/E316
RC 0097-01 11	Pipe: SA376/TP316	Valve: SA182/F316	ER316/E316
RH 0180-05 02	Pipe: SA376/TP316	Tee: SA403/WP316	Construction supplied piping spool that includes weld
SI 0202-02 17	Valve: SA182/F304	Pipe: SA376/TP316	ER308/E308
SI 0251-07 04	Pipe: SA376/TP316	Valve: SA182/F316	ER316/E316
SI 0251-07 05	Valve: SA182/F316	Pipe: SA376/TP316	ER308/E308

Figure 2IR-20-01  
Typical OD Profile Representing Various Components  
(Exam Limitation)

Sheet 7 of 7



NO COVERAGE DUE TO CONFIGURATION GEOMETRY



TYPICAL REPRESENTATION OF OD PROFILE FOR VARIOUS COMPONENTS