



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 4, 2012

Mr. Paul Freeman
Site Vice President
c/o Michael O'Keefe
Seabrook Station
NextEra Energy Seabrook, LLC
P.O. Box 300
Seabrook, NH 03874

SUBJECT: SEABROOK STATION, UNIT 1 - SECOND 10-YEAR INTERVAL INSERVICE
INSPECTION PROGRAM PLAN REQUEST FOR RELIEF NO. 2IR-18 (TAC NO.
ME6903)

Dear Mr. Freeman:

By letter dated August 17, 2011, as supplemented March 13, 2012, NextEra Energy Seabrook, LLC (NextEra or licensee) submitted request for relief 2IR-18 for the second 10-year inservice inspection (ISI) interval program at the Seabrook Station, Unit 1 (Seabrook) from certain examination requirements of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code). Specifically, the licensee requested relief from the ASME Code, Section XI requirements for examination Category C-B, Item C2.21, pressure retaining nozzle welds in vessels. The request is for the risk-informed examination for the second 10-year ISI interval, which ended August 18, 2010.

The U.S. Nuclear Regulatory Commission (NRC) staff, with technical assistance from its contractor, the Pacific Northwest National Laboratory (PNNL), has reviewed the subject request, and concludes that NexEra has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(6)(i). Therefore, the NRC staff grants relief from the specified ASME Code, Section XI, examination coverage requirements of the subject welds contained in relief request 2IR-19 for the Seabrook second 10-year ISI interval.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in the subject requests for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

P. Freeman

- 2 -

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact John G. Lamb at 301-415-3100 or via e-mail at John.Lamb@nrc.gov.

Sincerely,



Meena Khanna, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL

REQUEST FOR RELIEF NO. 2IR-18

NEXTERA ENERGY SEABROOK, LLC.

SEABROOK STATION, UNIT 1

DOCKET NUMBER 50-443

1.0 INTRODUCTION

By letter dated August 17, 2011, as supplemented March 13, 2012,¹ NextEra Energy Seabrook, LLC (NextEra or licensee) submitted request for relief 2IR-18 for the second 10-year inservice inspection (ISI) interval program at the Seabrook Station, Unit 1 (Seabrook) from certain examination requirements of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code). Specifically, the licensee requested relief from the ASME Code, Section XI requirements for examination Category C-B, Item C2.21, pressure retaining nozzle welds in vessels. The request is for the risk-informed examination for the second 10-year ISI interval, which ended August 18, 2010.

2.0 REGULATORY EVALUATION

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(4), American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, which was incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

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 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

¹ Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML11234A185 and ML120790313, respectively.

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.

10 CFR 50.55a(g)(6)(i), states that the Commission will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

The licensee has requested relief from ASME Code requirements pursuant to 10 CFR 50.55a(g)(6)(i). The ASME Code of Record for Seabrook second 10-year interval inservice inspection program, which ended on August 18, 2010, is the 1995 Edition through the 1996 Addenda of Section XI of the ASME Boiler and *Pressure Vessel Code*.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request and the Commission to grant the relief requested by the licensee.

3.0 TECHNICAL EVALUATION

The information provided by the licensee in support of the request for relief to ASME Code requirements has been evaluated and the bases for disposition are documented below.

3.1 Request for Relief 2IR-18, ASME Code, Section XI, Examination Category C-B, Item C2.21, Pressure Retaining Nozzle Welds in Vessels

ASME Code Requirement

ASME Code, Section XI, Examination Category C-B, Item C2.21, requires 100 percent volumetric and surface examination, as defined by ASME Code, Section XI, Figure IWC-2500-4(a) or (b), as applicable, of nozzle-to-shell (or head) welds in Class 2 vessels. ASME Code Case N-460, as an alternative approved for use by the NRC in Regulatory Guide 1.147, Revision 16, *Inservice Inspection Code Case Acceptability*, states that a reduction in examination coverage due to part geometry or interference for any Class 1 and 2 weld is acceptable provided that the reduction is less than 10 percent, i.e., greater than 90 percent examination coverage is obtained.

Licensee ASME Code Relief Request

In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the ASME Code-required volumetric examination of the "B" Containment Building Spray (CBS) Heat Exchanger Inlet and Outlet Nozzle-to-Shell Welds CBS E-16B N1 and CBS E-16B N2, respectively.

Licensee's Basis for Relief Request (as stated)

The "B" Containment Building Spray (CBS) heat exchanger inlet and outlet nozzle-to-shell welds were examined with a manual [UT (ultrasonic thickness)] 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.

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.

Licensee's Proposed Alternative Examination:

The licensee did not propose any alternative examinations for the subject welds. However, the licensee's examinations were performed to the maximum extent practical.

NRC Staff Evaluation

The ASME Code requires 100 percent volumetric and surface examinations of ASME Code, Class 2 nozzle-to-shell (or head) welds. However, for "B" CBS heat exchanger nozzle-to-shell welds, complete examinations are limited due to the nozzles' configuration and materials of construction. In order to achieve greater volumetric coverage, the nozzles and vessel would have to be redesigned and modified. This would place a burden on the licensee; therefore, the ASME Code volumetric examination is considered impractical.

As shown in the sketches and technical descriptions included in the licensee's submittal, examination of the type 304 stainless steel, "B" CBS Heat Exchanger Nozzle-to-Shell Welds CBS E-16B N1 and CBS E-16B N2 were performed to the extent practical, with the licensee obtaining 50 percent of the required examination volumes. The nozzles' "set-in" design essentially makes these weld volumes in the form of a concentric ring aligned parallel with the nozzle axis. For this reason, no meaningful UT scans can be performed from the nozzle side of the welds.

The licensee applied both 45-degree shear and 60-degree longitudinal wave (L-wave) scans from the accessible shell side of the welds. L-waves have been shown to provide enhanced detection on the far-side of austenitic stainless steel welds^{2 3 4}. Thus, while the licensee has only taken credit for obtaining 50 percent volumetric coverage, the techniques employed would

² F.V. Ammirato, X. Edelmann, and S.M. Walker, *Examination of Dissimilar Metal Welds in BWR Nozzle-to-Safe End Joints*, 8th International Conference on NDE in the Nuclear Industry, ASM International, 1987.

³ P. Lemaitre, T.D. Koble, and S.R. Doctor, PISC III Capability Study on Wrought-to-Wrought Austenitic Steel Welds: Evaluation at the Level of Procedures and Techniques, Effectiveness of Nondestructive Examination Systems and Performance Demonstration, PVP-Volume 317, NDE-Volume 14, ASME, 1995.

⁴ M. T. Anderson, A.A. Diaz, A.D. Cinson, S.L. Crawford, S.E. Cumblidge, S.R. Doctor, K.M. Denslow, and S. Ahmed, 2011. *An Assessment of Ultrasonic Techniques for Far-Side Examinations of Austenitic Stainless Steel Piping Welds*, NUREG/CR-7113, PNNL-19353, U. S. Nuclear Regulatory Commission, Washington, DC.

have provided some coverage beyond the near-side of the welds. This is confirmed from a review of the welds' cross-sectional information, which indicates that limited volumetric coverage on the far-side of the welds has been obtained. The licensee also completed the full ASME Code-required surface examinations (liquid penetrant) on both of these welds. No unacceptable indications were noted during the volumetric and surface examinations.

The licensee has shown that it is impractical to meet the ASME Code-required 100 percent volumetric examination coverage for the subject nozzle-to-shell welds due to the nozzles' configuration and materials. However, based on the volumetric and full surface coverage obtained, it is reasonable to conclude that, if significant service-induced degradation had occurred, evidence of it would have been detected by the examinations performed. Furthermore, the NRC staff determined that the examinations performed to the extent practical on the subject welds provide reasonable assurance of structural integrity of the subject welds.

4.0 CONCLUSIONS

As set forth above, the NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(6)(i). Therefore, the NRC staff grants relief from the specified ASME Code, Section XI, examination coverage requirements of the subject welds contained in relief request 21R-18 for the Seabrook second 10-year ISI interval.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in the subject requests for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributors: Tom McLellan and Steve Cumblidge

Date: June 4, 2012

SEABROOK STATION, UNIT 1
Second 10-Year ISI Interval

TABLE 1
SUMMARY OF RELIEF REQUEST

Relief Request Number	TLR RR Sec.	System or Component	ASME Code Exam. Category	ASME Code, Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Disposition
21R-18	3.1	Pressure Retaining Nozzle Welds in Vessels	C-B	C2.21	100% of ASME Code, Class 2 nozzle-to-shell welds	Surface and Volumetric	Use volumetric and surface coverage achieved	Granted 10 CFR 50.55a(g)(6)(i)

P. Freeman

-2-

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact John G. Lamb at 301-415-3100 or via e-mail at John.Lamb@nrc.gov.

Sincerely,

/ra/

Meena Khanna, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:
Safety Evaluation

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ADAMS Accession No. ML12144A435

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DATE	06/01/12	05 /31/12	05/18/12	05/18/12	06/04/12

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