



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

November 22, 2010

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

SUBJECT: SEABROOK STATION, UNIT NO. 1 - RELIEF REQUEST FOR USE OF
ALTERNATE DEPTH SIZING QUALIFICATION, THIRD 10-YEAR INTERVAL
(TAC NO. ME3623)

Dear Mr. Freeman:

By letter dated March 25, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100890436), as supplemented by letter dated August 31, 2010 (ADAMS Accession No. ML102500268), NextEra Energy Seabrook, LLC (the licensee), submitted a proposed alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). Specifically, the licensee proposed using a root mean square error criterion for sizing flaws that is greater than that allowed by the ASME Code.

The Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's analysis in support of the proposed alternative. The NRC staff concludes that the proposed alternative provides an acceptable level of quality and safety. The request is authorized for Seabrook pursuant to 10 CFR 50.55a(a)(3)(i) for the remainder of the third 10-year interval.

The NRC staff's evaluation and conclusions are contained in the enclosed safety evaluation. If you have any questions, please contact the Seabrook Project Manager, Mr. G. Edward Miller, at 301-415-2481.

Sincerely,

A handwritten signature in black ink, appearing to read "H. K. Chernoff", written over a light blue horizontal line.

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:
As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST ASSOCIATED WITH

DEPTH SIZING ACCEPTANCE CRITERIA

NEXTERA ENERGY SEABROOK, LLC

SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

1.0 INTRODUCTION

By letter dated March 25, 2010 (Agencywide Documents Access & Management System (ADAMS) ML100890436), supplemented by letter dated August 31, 2010 (ADAMS ML102500268) NextEra Energy Seabrook, LLC, (the licensee) submitted a relief request from certain examination requirements of the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code (Code) at the Seabrook Station, Unit 1. Specifically, the licensee proposed using a root mean square (RMS) error criterion for sizing flaws that is greater than ASME Code Case N-695, "Qualification Requirements for Dissimilar Metal Piping Welds." The licensee is applying ASME Code Case N-695 since the ASME Code does not provide criteria for examinations performed from the inside diameter (ID). Code Case N-695 is referenced in Regulatory Guide 1.147, Revision 16, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," for unconditional use. The request is for the third 10-year inservice inspection (ISI) interval which began on August 19, 2010.

2.0 REGULATORY EVALUATION

The ISI of ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states, in part, that alternatives to the requirements of paragraph (g) may be used when authorized by the Nuclear Regulatory Commission (NRC), if the applicant demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) will meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The

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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 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)(4)(iv) states that inservice examination of components and system pressure tests may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph 10 CFR 50.55a(b), subject to the limitations and modification listed in 10 CFR 50.55a(b) and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

3.0 TECHNICAL EVALUATION

3.1 Applicable ASME Code Edition and Addenda

The Code of Record for the third 10-year ISI program at Seabrook Station is the 2004 Edition of the ASME Code, Section XI. In addition, as required by 10 CFR 50.55a(b)(2)(xv), licensees who use later editions and addenda than the 2001 Edition of the ASME Code shall use the 2001 Edition of Appendix VIII, "Performance Demonstration for Ultrasonic Examinations Systems."

3.2 ASME Code Components Affected

The affected components are Class 1, Examination Category R-A (formerly Examination Category B-F, Item Number B5.10), Reactor Coolant System dissimilar metal welds (DMW) as shown in the table below.

Location	Nozzle-to-Safe End Weld Identification	Weld Type
RPV "A" Outlet Nozzle @ 202°	RC RPV-SE-301-121-A	Shop
RPV "B" Inlet Nozzle @ 227°	RC RPV-SE-302-121-B	Shop
RPV "C" Inlet Nozzle @ 293°	RC RPV-SE-302-121-C	Shop
RPV "D" Outlet Nozzle @ 338°	RC RPV-SE-301-121-D	Shop
RPV "E" Outlet Nozzle @ 22°	RC RPV-SE-301-121-E	Shop
RPV "F" Inlet Nozzle @ 67°	RC RPV-SE-302-121-F	Shop
RPV "G" Inlet Nozzle @ 113	RC RPV-SE-302-121-G	Shop
RPV "H" Outlet Nozzle @ 158	RC RPV-SE-301-121-H	Shop

3.3 Applicable Code Requirement

The examination of Class 1 piping welds is required to be performed using procedures, personnel, and equipment qualified to the criteria of the applicable ASME Code, Section XI, Appendix VIII Supplements. The applicable supplement to this relief is Supplement 10, "Qualification Requirements for Dissimilar Metal Piping Welds."

Paragraph 3.2, "Sizing Acceptance Criteria," subparagraph (b) of Supplement 10, requires that the examination procedures, equipment, and personnel are qualified for depth-sizing when the

RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 inch (3 mm).

Code Case N-695, "Qualification Requirements for Dissimilar Metal Piping Welds, Section XI, Division 1," provides alternative requirements to Appendix VIII, Supplement 10. Code Case N-695, Paragraph 3.3(c), states that "Examination procedures, equipment, and personnel are qualified for depth-sizing when the RMS error of the flaw depth measurements as compared to the true flaw depths, do not exceed 0.125 in (3 mm)." Code Case N-695 is unconditionally approved for use through Regulatory Guide 1.147, "In-service Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 16.

3.4 Licensee Basis for the Alternative

For the subject welds, the licensee proposes using an alternative depth-sizing RMS error value greater than the 0.125-inch RMS error value stated in Supplement 10 and Code Case N-695.

The licensee stated the most recent attempt at achieving 0.125-inch RMS was in early 2008. This attempt, as well as previous attempts, did not achieve the required RMS values for personnel or procedures and the qualification attempts have been substantial. The attempts have involved multiple vendors, ultrasonic instruments, personnel and flaw depth sizing methodologies, all of which have been incapable of achieving the 0.125-inch RMS value.

The licensee stated that for these qualifications, only three domestic inspection vendors have demonstrated a capability to depth-size flaws. Of the three vendors, the largest demonstrated flaw sizing error for Supplement 10 is 0.224 inches. As an alternative to the required RMS error, the licensee will add the difference between the required RMS error value of 0.125-inch RMS and the actual RMS error value achieved by their chosen inspection vendor, up to a maximum achieved value of 0.224 inches. The vendor-achieved RMS error value will be as indicated by letter from the Performance Demonstration Administrator (PDA).

The licensee stated that applying the difference between the required RMS error and the vendor-achieved RMS error to the actual flaw size, will continue to ensure a conservative flaw bounding approach and provide an acceptable level of quality and safety.

3.5 NRC Staff Evaluation

The licensee's Code of Record for the third 10-year ISI interval is the 2004 Edition. The ASME Code requires that dissimilar metal welds (DMW) be examined using procedures, equipment, and personnel qualified to Section XI, Appendix VIII, Supplement 10. Supplement 10, states that examination procedures, equipment, and personnel are qualified for depth-sizing when the RMS error of the flaw depth measurements, as compared to true depths, do not exceed 0.125 inch. The Code of Record does not provide criteria for examinations performed from the inside diameter (ID) surface. As an alternative to Supplement 10, the ASME Code developed Code Case N-695 for qualifications performed from either the inside or outside diameter of DMWs. Code Case N-695 also states that examination procedures, equipment, and personnel are qualified for depth-sizing when the RMS error of the flaw depth measurements, as compared to true depths, do not exceed 0.125 inch. Code Case N-695 is endorsed in RG-1.147, Revision 16 with no conditions.

The nuclear industry is in the process of qualifying personnel to Supplement 10 as implemented by the Performance Demonstration Initiative (PDI) program. However, for demonstrations performed from the inside surface of a pipe weld, personnel have been unsuccessful at achieving the ASME Code-required 0.125 inch RMS error flaw depth sizing criterion. At this time, the staff concurs that achieving the 0.125 inch RMS error for depth sizing does not appear to be feasible as personnel have only been capable of achieving an accuracy of 0.189 inch RMS error to size any detected flaws.

The licensee stated that for these qualifications, only three domestic inspection vendors have demonstrated a capability to depth-size flaws. Of the three vendors, the largest demonstrated flaw sizing error for Supplement 10 is 0.224 inches. As an alternative to the required RMS error, in the event that an indication is detected that requires depth sizing, the licensee will add the difference between the required RMS error value of 0.125-inch RMS and the actual RMS error value achieved by their chosen inspection vendor, up to a maximum achieved value of 0.224 inches (e.g., 0.224 inch – 0.125 inch = 0.099 inch). The achieved RMS error value will be as indicated by letter from the PDA specific to the vendor. This measured through-wall depth will then be assessed against the applicable acceptance criteria. In the licensee's August 31, 2010, response to the NRC's RAIs, the licensee stated that "for the 3rd ISI Interval at Seabrook Station, NextEra will use the acceptance requirements of ASME Section XI, 2004 Edition with no addenda along with the guidance contained in MRP-139, implemented in accordance with the NEI 03-08 protocol until such time that 10 CFR 50.55a restricts or modifies their use." The NRC staff finds that compliance with the ASME Code-required 0.125-inch RMS error value is not feasible at this time. Additionally, the NRC staff finds that a maximum RMS error value of 0.224 inches still provides sufficient accuracy of flaw characterization such that assessing the flaw against the appropriate acceptance standards defined in the ASME Code, Section XI and MRP-139, will continue to provide reasonable assurance of structural integrity.

4.0 CONCLUSION

Based on the above review, the NRC staff concludes that compliance with the ASME Code Supplement 10 and Code Case N-695 required 0.125-inch depth sizing RMS error is impractical. Further, the proposed alternative to add the difference between the required RMS error value of 0.125-inch RMS and the actual RMS error value achieved by their chosen inspection vendor, up to a maximum achieved value of 0.224 inches in conjunction with the use of appropriate acceptance standards, continues to provide reasonable assurance of structural integrity of the subject welds. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted to Seabrook Station, Unit 1 for the third 10-year ISI interval. The granting of relief 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 the consideration of the burden upon the licensee. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: C. Nove

Date: November 22, 2010

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Site Vice President
c/o Mr. Michael O'Keefe
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/ra/

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