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

October 15, 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 SYSTEM PRESSURE TEST EXAMINATIONS ON CLASS 1 COMPONENT PRESSURE BOUNDARIES, THIRD 10-YEAR INTERVAL (TAC NO. ME2418)

Dear Mr. Freeman:

By letter dated October 7, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092920156), as supplemented by letter dated December 23, 2009 (ADAMS Accession No. ML100060472), 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), Section XI for Seabrook Station, Unit No. 1 (Seabrook). These requirements pertain to pressure testing of Class 1 component pressure boundaries. Specifically, the proposed alternative would exclude a segment of the Class 1 boundary from attaining the required test pressure.

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)(ii) for the remainder of the third 10-year interval.

The NRC staffs 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,

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

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

RELIEF REQUEST ASSOCIATED WITH

SYSTEM PRESSURE TEST EXAMINATIONS ON

CLASS 1 COMPONENT PRESSURE BOUNDARIES

NEXTERA ENERGY SEABROOK, LLC

SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

1.0 INTRODUCTION

By letter dated October 7, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092920156), 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), Section XI for Seabrook Station, Unit No. 1 (Seabrook). These requirements pertain to pressure testing of Class 1 component pressure boundaries. Specifically, the proposed alternative would exclude a segment of the Class 1 boundary from attaining the required test pressure. Instead, the licensee would perform a visual inspection of the excluded segments to detect degraded conditions. By letter dated December 23, 2009 (ADAMS Accession No. ML100060472), the licensee added a length of 2" Reactor Coolant System (RCS) vent piping to the areas affected by the request.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g) requires that inservice inspection (ISI) of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph 50.55a(g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement 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) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for ISI of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI 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. The ISI Code of Record for the second 10-year inspection interval of Seabrook Station Unit No. 1 is the 1995 Edition through 1996 Addenda of the ASME Code, Section XI.

3.0 TECHNICAL EVALUATION

3.1 ASME Code Components Affected

The following areas of the Reactor Coolant Pressure boundary (RCPB) are affected:

1. Chemical and Volume Control System (CVCS) Piping to Excess Letdown Heat Exchanger;

2. CVCS Heat Exchanger to Pressurizer and to the Loop 4 Cold Leg;

3. Safety Injection (SI) System High, Intermediate, and Low-head injection to RCS; and

4. Vents, Drain, Instrumentation, and Test Connection Double Valve Isolation Segments.

The specific components affected by this request are:

1. RCS Loop 1
    a. RCS 12" piping between 1-RC-V-22 and 1-RC-V-23
    b. RCS 2" drain piping between 1-RC-V-17 and a blind flange

2. RCS Loop 2
    a. RCS 2" drain piping between 1-RC-V-51 and a blind flange

3. RCS Loop 3
    a. RCS 2" drain piping between 1-RC-V-80 and a blind flange
    b. CVCS 1" piping between 1-CS-V-175 and 1-CS-V-176 (piping to Excess Letdown Heat Exchanger)

4. RCS Loop 4
    a. RCS 12" piping between 1-RC-V87 and 1-RC-V-88
    b. RCS 2" drain piping between 1-RC-V-110 and a blind flange

5. Pressurizer
    a. RCS 2" vent piping between 1-RC-V-468 and a blind flange

6. CVCS Heat Exchanger (1-CS-E-2)
    a. 2" piping from 1-CS-V-185 to 1-CS-V-186 (to Pressurizer)
    b. 3" piping from 1-CS-V-178 to 1-CS-V-179 (to RCS Loop 4 Cold Leg)

7. SI High Head Injection
    a. 3" piping from 1-SI-V-140 to 1½" piping to 1-SI-V-152 (RCS Loop 3 Cold Leg)
    b. Piping interconnected to the 3" line noted 6.a, from 1-SI-V-140
        i. 1½" piping to 1-SI-V-148 (RCS Loop 2 Cold Leg)
        ii. 1½" piping to 1-SI-V-144 (RCS Loop 1 Cold Leg)
        iii. 1½" piping to 1-SI-V-156 (RCS Loop 4 Cold Leg)

8. SI Intermediate Head Injection
    a. 2" piping from 1-SI-V-81 to 3" piping changing to 6" piping to 1-SI-V-82 (RCS Loop 3 Hot Leg Injection)
    b. 2" piping from 1-SI-V-86 to 3" piping changing to 6" piping to 1-SI-V-87 (RCS Loop 2 Hot Leg Injection)
    c. 2" piping from 1-SI-V-106 to 8" Residual Heat Removal System (RHR) piping to 1-RH-V-50 and 6" piping to 1-RH-V-53 (RCS Loop 4 Hot Leg Injection)
    d. 2" piping from 1-SI-V-110 to 8" RHR piping to 1-RH-V-51 and 6" piping to 1-RH-V-52 (RCS Loop 4 Hot Leg Injection)

9. SI Low Head Injection (Accumulators)
    a. 1-SI-TK-9-A 10" piping from 1-SI-V-6 to 1-SI-V-5, including connected 10" RHR piping to 6" RHR piping to 1-RH-V-15 and 2" SI piping connected to the 6" RHR piping to 1-SI-V-118
    b. 1-SI-TK-9-B 10" piping from 1-SI-V-21 to 1-SI-V-20, including connected 10" RHR piping to 6" RHR piping to 1-RH-V-31 and 2" SI piping connected to the 6" RHR piping to 1-SI-V-122
    c. 1-SI-TK-9-C 10" piping from 1-SI-V-36 to 1-SI-V-35, including connected 10" RHR piping to 6" RHR piping to 1-RH-V-29 and 2" SI piping connected to the 6" RHR piping to 1-SI-V-126
    d. 1-SI-TK-9-D 10" piping from 1-SI-V-51 to 1-SI-V-50, including connected 10" RHR piping to 6" RHR piping to 1-RH-V-30 and 2" SI piping connected to the 6" RHR piping to 1-SI-V-130

3.2 ASME Code Requirements

The 1995 Edition including addenda up to 1996 of the ASME Code, Section XI, Paragraph IWB-5222(b) in Examination Category B-P of Items B15.50 and B15.70 require that the pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval extend to all Class 1 pressure retaining components within the system boundary.

3.3 Proposed Alternative

The licensee proposes that during the second 10-year ISI interval, system leakage tests on Class 1 pressure retaining components within the system boundary be performed with the inboard and outboard isolation valves configured in their normal reactor startup position. The VT-2 visual examination for leakage will extend to and include the second closed isolation valve or closure device at the boundary extremity.

3.4 Licensee Basis for the Alternative

Performing leakage test of the Class 1 boundary beyond the inboard isolation valves at or near the end of each inspection interval requires conditions that place the plant in abnormal configurations or requires off-normal activities in order to pressurize the subject piping. These challenges include abnormal line-ups, installing jumpers around valve operation interlocks, installing and removing piping jumpers around valves, removing valve internals, and installing plugs. Associated with each challenge come additional burdens prior to plant restart, such as:

- Valve manipulations which add unnecessary challenges to maintaining the plant in a safe configuration. In some cases, the impracticality of manually opening inboard isolation valves (e.g., check valves) mandates alternate lineups that challenge system integrity.

- System preparations and restorations required inside containment including radiologically restricted areas that increase radiation exposure to plant personnel, contaminate test equipment and create avoidable radiological waste.

- Routing temporary hoses/piping containing high pressure RCS fluid throughout containment, thereby creating significant personnel safety and radiological exposure hazards. The risks are further compounded by the tripping hazards plant workers inside containment must endure as a result of the hoses being routed throughout.

- Reliance upon a single closure device past the first isolation valve to contain RCS pressure from lower design pressure components and piping. This creates a significant personnel safety hazard and could lead to permanent damage to plant equipment. In addition, maintaining a homogeneous boron concentration in the RCS could be challenged.

These off-normal configurations and challenges may also contribute to the burden of delaying normal plant start-up because of the critical path time and effort required to ensure system configuration is restored and tested.

The licensee believes that subjecting the applicable piping segments to RCS pressure is not necessary to adequately conduct the Code-required VT-2 visual examinations for the detection of leakage or evidence of past leakage. The proposed alternative method maintains RCS barriers intact during the VT-2 visual examinations, rather than opening or bypassing the first isolation barrier prior to the examination. The Class 1 piping between the inboard and the outboard isolation valves is normally pressurized, albeit at a lower pressure, by stabilized pressure from normal seat leakage originating at the first isolation valve. This pressure is sufficient for detecting leakage and/or evidence of past leakage during system pressure tests. Therefore, the licensee proposes to validate and document the pressure boundary integrity of these piping segments and components using identical VT-2 visual examination requirements during reactor start-up following each refueling outage. This alternative would result in saving significant personnel exposure and minimizing the risk of personnel injury or contamination associated with opening or bypassing normally closed isolation devices.

3.5 NRC Staff Evaluation

The ASME Code, Section XI of Record requires that all Class 1 components within the RCS boundary undergo a system leakage test at or near the end of each inspection interval. In its request, the licensee proposed an alternative to test the Class 1 piping segments between the inboard and outboard isolation valves including the isolation valves in the RCPB identified in Section 3.1 of this safety evaluation. The licensee's proposed alternative is to configure the inboard/outboard isolation valves or closure devices in their normal reactor startup position during system leakage tests on Class 1 pressure retaining components and perform the VT-2 visual examination for leakage of the piping segment extending to and including the second closed isolation valve or closure device at the boundary extremity.

The nominal operating pressure for the components is that of its connecting system unless the inboard check valve leaks. In order to perform the Code-required system leakage test for these components in the extended Class 1 pressure boundary, an alternative method of pressurizing it to the normal system operating pressure would be required. The NRC staff believes that the provision for pressurization for the system leakage test would require considerable man-hour effort resulting in high radiological exposure to personnel. Furthermore, pressurization by this method would preclude the RCS double valve isolation and may cause safety concerns for the personnel performing the examination.

This alternative, however, would expose the extended Class 1 boundary to a lower test pressure that corresponds to the pressure of each connecting system in lieu of the Code-required RCS pressure corresponding to 100 percent power. The NRC staff finds that the Class 1 piping between the inboard and the outboard isolation valves would normally be pressurized, albeit at a lower pressure and that this pressure is sufficient for detecting leakage and/or evidence of past leakage during system pressure tests. Therefore, the NRC staff finds that the lower pressure system leakage test of the components in the extended Class 1 boundary will continue to demonstrate any leakage in the pressure boundary albeit at a lower leak rate than that associated with the Code-required test pressure.

Additionally, the NRC staff finds that testing at the system operating pressure in lieu of the Code-required test pressure is acceptable because there is no known degradation mechanism, such as intergranular stress-corrosion cracking, primary water stress-corrosion cracking, or thermal fatigue, that is likely to affect the welds in the subject segments.

Based on this evaluation, the NRC staff concurs with the licensee's assertion that compliance to the Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Further, the NRC staff believes that the licensee's proposed alternative provides reasonable assurance that any degradation of the structural integrity of the components in the extended Class 1 boundary will be detected in a timely manner, while maintaining personnel radiation exposure to as low as reasonably achievable.

4.0 CONCLUSION

Based on the NRC staff's evaluation of the licensee's proposed alternative, the requirements of the 1995 Edition with the 1996 Addenda, Paragraph IWB-5222(b) of the ASME Code, Section XI with regard to the test boundaries for the segment of Class 1 piping between the inboard and the

outboard isolation valves would cause hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee's proposed alternative in the request for relief provides reasonable assurance of structural integrity. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative in Relief Request 2AR-07 is authorized for the second 10-year ISI interval of Seabrook Station Unit No. 1. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: P. Patnaik

Date: October 15, 2010

October 15, 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 SYSTEM PRESSURE TEST EXAMINATIONS ON CLASS 1 COMPONENT PRESSURE BOUNDARIES, THIRD 10-YEAR INTERVAL (TAC NO. ME2418)

Dear Mr. Freeman:

By letter dated October 7, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092920156), as supplemented by letter dated December 23, 2009 (ADAMS Accession No. ML100060472), 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), Section XI for Seabrook Station, Unit No. 1 (Seabrook). These requirements pertain to pressure testing of Class 1 component pressure boundaries. Specifically, the proposed alternative would exclude a segment of the Class 1 boundary from attaining the required test pressure.

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)(ii) for the remainder of the third 10-year interval.

The NRC staffs 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,
/ra/
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

cc w/encls: Distribution via Listserv

DISTRIBUTION:
PUBLIC
RidsOgcRp Resource
RidsNrrPMSeabrook
RidsNrrDciCsgbResource
LPLI-2 R/F
RidsAcrsAcnw_MailCTR Resource
RidsNrrLAABaxter
RidsRgnIMailCenter Resource
RidsNrrLpl-2 Resource
LTrocine, EDO, RI

ADAMS Accession No.: ML10102350341 **not required per ML092220406 *via memorandum dated 5/12/10
^ via email

OFFICE	LPL1-2/PM	LPL1-2/LA	CSGB/BC	OGC	LPL1-2/BC
NAME	GEMiller	ABaxter ^ (edits only)	RTaylor*	**	HChernoff
DATE	8/27/10	9/01 /10	5/12/10	/ /10	10/15/10

OFFICIAL RECORD COPY