NEXTera ENERGY SEABROOK

December 23, 2009

Docket No. 50-443
SBK-L-09256

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

Seabrook Station

10 CFR 50.55a Request 2AR-07, Revision 1, Second Interval ISI Program
Category B-P Exams – 10-Year Class 1 System Leakage Test

Pursuant to 10 CFR 50.55a(a)(3)(ii), on October 7, 2009, NextEra Energy Seabrook, LLC, (NextEra Energy Seabrook) requested Nuclear Regulatory Commission approval of the following proposed alternative for the Second 10-Year In-Service Inspection interval to perform the system pressure test examination on selected portions of Class 1 component pressure boundaries at plant conditions other than those required by American Society of Mechanical Engineers, ASME Section XI Code, 1995 Edition, 1996 Addenda. Subsequently, while reviewing ISI program documents, NextEra Energy Seabrook discovered that there is an additional section of piping (RCS 2" vent piping between valve 1-RC-V-468 and a blind flange) that should have been included in the request. Relief was requested on the basis that hardship and unusual difficulty exists in establishing a pressurized system configuration extending to the second normally closed valve that will subject all Class 1 components to Reactor Coolant System operating pressure during the required system pressure test, without a compensating increase in the level of quality and safety. The details of 10 CFR 50.55a Request 2AR-07, Revision 1, are contained in the enclosure to this letter. NextEra Energy Seabrook has enclosed the drawing on which the additional piping is found (PID-1-RC-D20846) plus a drawing inadvertently omitted from the original request (PID-1-SI-D20447). Drawings submitted with the original request remain valid and should be used to review this request.

The NextEra Energy Seabrook proposed alternative from code requirements for selected Class 1 piping and valves will continue to provide an acceptable level of quality and safety. NextEra Energy Seabrook requests approval of the proposed alternative by August 1, 2010, prior to the end of the second interval.

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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

Gene St. Pierre
Vice President - North

cc: S. J. Collins, NRC Region I Administrator
D. L. Egan, NRC Project Manager
W. J. Raymond, NRC Resident Inspector

Attachment to SBK-L-09256

ATTACHMENT

10 CFR 50.55a Request Number 2AR-07, Rev. 1

Proposed Alternative
In Accordance with 10 CFR 50.55a (a)(3)(ii)
-Compliance with the Specified Requirements would result in Hardship or Unusual Difficulty without a Compensating Increase in the Level of Quality and Safety-

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

The ASME Boiler and Pressure Vessel (BPV) Code Section Xl (Reference 1) Examination Category and Item Number of Table IWB-2500-1 are:

Examination Category	Item No.	Description
B-P	B15.50	Piping - Pressure retaining boundary
	B15.70	Valves - Pressure retaining boundary

See Attachment A for identified items.

2. **Applicable Code Edition and Addenda**

NextEra Energy Seabrook, LLC (NextEra Energy Seabrook) is currently in the 2nd 10-year Inservice Inspection (ISI) interval. The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) of record for the current 10-year ISI interval is Section XI, 1995 Edition, including Addenda through 1996 (Reference 1).

3. **Applicable Code Requirement**

ASME Section Xl, Subparagraph IWB-5222(b) requires, "The pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval shall extend to all Class 1 pressure retaining components within the system boundary."

4. **Reason for Request**

Pursuant to 10 CFR 50.55a(a)(3)(ii), NextEra Energy Seabrook requests relief from applying a system leakage test to Class 1 components at full Reactor Coolant System (RCS) pressure for those components normally isolated from RCS pressure.

NextEra Energy Seabrook has concluded that compliance with Code requirements to apply RCS pressure to test components and piping beyond the first isolation valve imposes significant hardships without a compensating increase in the level of quality and safety.

Hardships associated with testing performed in accordance with the referenced Code Items 2 and 3 requirements are as follows:

- Special valve lineups and/or the use of temporary high pressure hoses/piping containing RCS pressure required for these tests add unique challenges to system configuration.
- The associated components and piping are located inside containment. Tests performed inside the radiologically restricted area increases total exposure to plant personnel while modifying and restoring system lineups, as well as contamination of test equipment.
- Use of single valve isolation from systems with lower design pressures could result in over-pressurization of these systems and damage to permanent plant equipment.
- Pressurization of some double valve isolation pipe segments would require use of temporary high pressure hoses/piping containing RCS pressure or hydrostatic test pressure. These hoses would run throughout containment, would present a significant personnel safety hazard should they burst and may also damage permanent plant equipment. Hoses on the floor are also a tripping hazard for workers in containment.
- Use of a single closure device past the first isolation valve is a significant personnel safety hazard.
- Leakage past isolation valves to the RCS during special tests could affect RCS boron concentration and complicate the task of maintaining homogeneous boron concentrations.

5. Proposed Alternative and Basis for Use

The Class 1 System Leakage Test will be conducted at or near the end of the inspection interval, prior to reactor startup. Segments of Class 1 piping between the inboard isolation valve and outboard isolation valve/closure device, including the valves/closure devices and components in the system boundary, will be visually examined for evidence of past leakage and/or leakage during the system leakage test conducted with the isolation valves/closure devices in the position required for normal reactor startup.

Pressurization of components outside their normal alignment at normal operating temperature and pressure in order to detect leakage during the VT-2 visual examination presents unique challenges. Piping with two isolation valves/closure devices is designed to operate with the first isolation valve closed. Piping between the inboard isolation valve and

the outboard isolation valve/closure device during normal plant operations is pressurized, but at a lower pressure.

Temperatures and pressures present in Class 1 components during a system leakage test at a pressure associated with normal system operation is sufficient to qualify as a System Pressure Test. Pressure boundary integrity of these components is validated and documented using identical VT-2 visual examination requirements each refueling outage. The requested relief will apply VT-2 examinations of the Class 1 boundary beyond the first isolation valves at a stabilized pressure based on normal system lineups for reactor startup.

NextEra Energy Seabrook performs other surveillances (i.e. Local Leakage Rate Tests, Leakage Reduction Program Surveillances, Pressure Isolation Check Valve Leak Tests and ISI System Leakage Tests) to monitor these components for leakage. Leakage is identified using normal operating temperature and pressure conditions. In addition to leakage testing, boric acid inspections performed during refueling outages also identify leakage from these components.

Attachment A contains a listing of segments (valves and piping) to which this relief request pertains.

NextEra Energy Seabrook has identified piping segments between inboard isolation valves and outboard isolation valves in the system boundary that provides double isolation of the RCS. Under normal plant operating conditions, the subject pipe segments would see RCS temperature and pressure only if leakage through an inboard isolation valve occurs. With the inboard isolation valve closed during the system leakage test, the segment of piping between an inboard valve and the outboard valve would not be pressurized to the required test pressure during a system leakage test. In order to perform the ASME Code-required test, it would be necessary to manually open each inboard isolation valve to pressurize the corresponding pipe segment, or keep the inboard and outboard isolation valves closed and utilize temporary high pressure hoses/piping, or perform a hydrostatic test using temporary high pressure hoses/piping attached to these pipe segments. Pressurization by these methods would preclude double isolation of the RCS. Single valve isolation is a significant personnel safety hazard to plant personnel performing visual (VT-2) examination for leakage, testing personnel who install/remove temporary high pressure hoses/piping, and to operators performing manual valve manipulation and restoration. When temporary high pressure hoses/piping are used to pressurize associated segments for this test, the numerous hoses that run throughout containment are a significant personnel safety hazard due to potential hose separation. Also, single valve isolation between interface systems with lower design pressures could result in over-pressurization of the lower pressure systems and damage to permanent plant equipment.

Two inch drain lines off piping at the lowest elevation of the intermediate leg of each of 4 loops in the RCS boundaries provide double-isolation with use of a valve and a blind flange. In addition, at the top of the Pressurizer there is a 2 inch vent line with similar double-isolation provided with a valve and a blind flange. Under normal plant operating

conditions, the subject pipe segments would see RCS temperature and pressure only if leakage through the isolation valve occurs. With the isolation valve closed during the system leakage test, the segment of piping between the valve and the outboard closure device would not be pressurized to the required test pressure during a system leakage test. In order to perform the ASME Code-required test, it would be necessary to manually open each inboard isolation valve to pressurize the corresponding pipe segment. Pressurization by this method would preclude double isolation of the RCS. A single isolation of associated drains and vent is a significant personnel safety hazard to the personnel performing visual (VT-2) examinations for leakage and to operators performing manual valve manipulations and restoration. The other alternative is to attach a hydro test connection and pressurize the piping to full RCS pressure. Installation of the test connection provides only single isolation from the drain and vent valve. This poses a significant personnel safety hazard if the valve were to fail or leak. These hoses to the temporary test connections would run throughout containment and are a significant personnel safety hazard should they burst and may also damage permanent plant equipment. Hoses on the floors are also a tripping hazard for workers in containment.

Isolation valves associated with double valve isolation segments are located inside containment and as a result total exposure to plant personnel would increase when installing and removing temporary high pressure hoses/piping and performing valve manipulations. In accordance with 10 CFR 20.1003, radiation exposure is to be maintained as far below dose limits specified in 10 CFR Part 20 as practical consistent with the purpose for which the activity is undertaken. This requires having exposure for the required system pressure test as low as reasonably achievable (ALARA).

At Seabrook Station all of the 3/4 inch and 1 inch vents and drains off of the RCS contain orifices which change the piping and valves from Class 1 to Class 2. These vents and drains are included in the VT-2 examination during the Mode 3 test but are exempt from the full RCS pressure requirements included in Subparagraph IWB-5222(b).

Therefore, NextEra Energy Seabrook proposes that in lieu of the 10 year Class 1 System Leakage Test that extends full RCS pressure to all Class 1 pressure retaining components within the system boundary, a normal system leakage test be performed with valves in their position for normal reactor startup. The VT-2 visual examination for leakage for the alternative will extend to, and include the second closed valve or closure device at the Class 1 boundary.

6. Duration of Proposed Alternative

NextEra Energy Seabrook requests permission to implement the system leakage test modified as described above for the tests to be performed in the current 10-year in-service inspection interval. The interval ends August 19, 2010.

7. Precedents

Letter to John Carlin (Ginna LLC) from John Boska (NRC), Dated May 5, 2009, "R.E Ginna Nuclear Power Plant - Authorization of Relief Request No. 23 RE: Fourth Interval ISI Program Category B-P Exams – 10 year Class 1 Leakage Exam – R.E Ginna Nuclear Power Plant (TAC No. ME0456)" (ADAMS Accession #ML091270259)

Letter to Edwin D Halpin (STP) from Michael T. Markely (NRC), Dated November 12, 2008, "South Texas Project (STP), Units 1 and 2 - Authorization of Relief Request No. RR-ENG-2-51 on System Pressure Test of Class 1, 2 and 3 Systems (TAC NOS. MD8951 and MD8952)", (ADAMS Accession #ML082770785)

Letter to J.A. Stall (FPL) from Thomas H. Boyce (NRC), Dated March 4, 2008, "St. Lucie Nuclear Plant, Unit 1 – Safety Evaluation of Relief Request No. 29 to use alternative plant conditions on Class 1 Piping and Valves (TAC No. MD5145)", (ADAMS Accession #ML080500075)

8. References

1) American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 1995 Edition, including Addenda through 1996

ATTACHMENT A

PIPING SEGMENTS AND BOUNDARY VALVES NUMBERS

PID-1-RC-D20841
Reactor Coolant System (RCS) Loop 1

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

PID-1-RC-D20842
Reactor Coolant System (RCS) Loop 2

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

PID-1-RC-D20843
Reactor Coolant System (RCS) Loop 3

- RCS 2" drain piping between 1-RC-V-80 and a blind flange
- Chemical and Volume Control (CS) 1" piping between 1-CS-V-175 and 1-CS-V-176 (piping to Excess Letdown Heat Exchanger)

PID-1-RC-D20844
Reactor Coolant System (RCS) Loop 4

- RCS 12" piping between 1-RC-V-87 and 1-RC-V-88
- RCS 2" drain piping between 1-RC-V-110 and a blind flange

PID-1-RC-D20846
Pressurizer
RCS 2" vent piping between 1-RC-V-468 and a blind flange*

PID-1-CS-D20722
Chemical and Volume Control (CS) Heat Exchanger (1-CS-E-2)

- 2" piping from 1-CS-V-185 to 1-CS-V-186 (to Pressurizer)
- 3" piping from 1-CS-V-178 to 1-CS-V-179 (to Loop 4 Cold Leg)

PID-1-SI-D20447
Safety Injection System (SI) High Head Injection

- 3" piping from 1-SI-V-140 to 1 1/2" piping to 1-SI-V-152 (RCS Loop 3 Cold Leg)
- The following piping is interconnected to the 3" line noted above and comes from 1-SI-V-140
- 1 1/2" piping to 1-SI-V-148 (RCS Loop 2 Cold Leg)
- 1 1/2" piping to 1-SI-V-144 (RCS Loop 1 Cold Leg)
- 1 1/2" piping to 1-SI-V-156 (RCS Loop 4 Cold Leg)

* piping added by request AR-07, Revision 1.

ATTACHMENT A (cont'd)

PIPING SEGMENTS AND BOUNDARY VALVES NUMBERS

PID-1-SI-D20446, & PID-1-RH-D20663
Safety Injection System (SI) Intermediate Head Injection

- 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)
- 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)
- 2" piping from 1-SI-V-106 to 8" RHR piping to 1-RH-V-50 and 6" Piping to 1-RH-V-53 (RCS Loop 4 Hot Leg Injection)
- 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 1 Hot Leg Injection)

PID-1-SI-D20450, PID-1-SI-D20446, PID-1-RH-D20662, & PID-1-RH-D20663
Safety Injection System (SI) Low Head Injection (Accumulators)

- (1-SI-TK-9-A) 10" piping from 1-SI-V-6 to 1-SI-V-5, off this line is 10" RHR piping to 6" RHR piping to 1-RH-V-15. Also there is a 2" SI piping line off the 6" RHR piping to 1-SI-V-118
- (1-SI-TK-9-B) 10" piping from 1-SI-V-21 to 1-SI-V-20, off this line is 10" RHR piping to 6" RHR piping to 1-RH-V-31. Also there is a 2" SI piping line off the 6" RHR piping to 1-SI-V-122
- (1-SI-TK-9-C) 10" piping from 1-SI-V-36 to 1-SI-V-35, off this line is 10" RHR piping to 6" RHR piping to 1-RH-V-29. Also there is a 2" SI piping line off the 6" RHR piping to 1-SI-V-126
- (1-SI-TK-9-D) 10" piping from 1-SI-V-51 to 1-SI-V-50, off this line is 10" RHR piping to 6" RHR piping to 1-RH-V-30. Also there is a 2" SI piping line off the 6" RHR piping to 1-SI-V-130

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