NEXTera ENERGY SEABROOK

August 1, 2012

Docket No. 50-443
SBK-L-12137

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20582

Seabrook Station

Relief Request – Proposed Alternative in accordance with 10 CFR 50.55a (a)(3)(ii)

Pursuant to 10 CFR 50.55a(a)(3)(ii), NextEra Energy Seabrook, LLC (NextEra Energy Seabrook) respectfully requests approval for an alternative to the requirements of ASME Code, Section XI, subarticle IWA 4422.1. NextEra Energy Seabrook is planning to examine Class 3 service water (SW) system buried piping in accordance with the requirements of the Seabrook Station buried piping program during the upcoming fall 2012 refueling outage. Some portions of the buried SW piping to be inspected are located more than 24 feet below grade, with run lengths several hundred feet from the point of entry. Should areas requiring repair be detected during these inspections, NextEra Energy Seabrook requests relief from ASME Code, Section XI, subarticle IWA 4422.1 requirements that defective portions of components be removed prior to performing a repair activity by welding. NextEra Energy Seabrook is in the third 10-year inservice inspection interval which ends August 18, 2020.

Details of the request are contained in the attachment to this letter. NextEra Energy Seabrook requests approval of this request by September 25, 2012, to support schedules for inspecting portions of the Seabrook Station service water system during the fall 2012 refueling outage.

A047
NRC

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

Kevin T. Walsh
Site Vice President

Attachment:

Request RA-12-001, Proposed Alternative in accordance with 10 CFR 50.55a (a)(3)(ii)

cc:

W. M. Dean, NRC Region I Administrator
J. G. Lamb, NRC Project Manager
W. J. Raymond, NRC Senior Resident Inspector

Attachment to SBK-L-12137

Request RA-12-001
Proposed Alternative in accordance with 10 CFR 50.55a (a)(3)(ii)

SEABROOK STATION UNIT 1
RELIEF REQUEST RA-12-001, REVISION 0

Proposed Alternative in accordance with 10 CFR 50.55a (a)(3)(ii)

Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

1. **ASME Code Component Affected**
The affected piping is the A train 24-inch diameter service water supply pipes, line numbers 1801-3 and 1818-3, which supply cooling water to the Primary Component Cooling Water (PCCW) Heat Exchanger CC-E-17-A. These lines supply seawater to the PCCW Heat Exchanger, which is used to remove heat from systems and components during normal plant operation and emergency plant evolutions.

2. **Applicable Code Edition and Addenda**
The applicable Code of Record for the current 10-Year Inservice Inspection (ISI) program is the ASME Code, Section XI, 2004 Edition with no Addenda. The affected portion of the service water piping was designed and constructed in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Subsection ND, 1977 Edition, with no Addenda.

3. **Applicable Code Requirement**
IWA-4422.1 requires that defects be removed or reduced to an acceptable size prior to implementing a repair or replacement in accordance with the requirements of IWA-4000. The proposed repair method would not be consistent with IWA-4422.1.

4. **Reason for Request**
During the scheduled September 2012 refueling outage, NextEra Energy Seabrook personnel and/or their representatives will be entering the A train service water buried piping for the purpose of inspecting the integrity of the cement lining. The potential exists for the identification of a localized area of liner loss and the need for repair. Adherence to all of the provisions of ASME Section XI, Article IWA-4000 will be challenging due to the confined space of the piping inside diameter (ID) of 22.50 inches (24-inch nominal pipe, standard schedule, 0.375-inch liner), which presents a significant safety concern. Some portions of the buried SW piping are located 24.50 feet below grade, with pipe run lengths several hundred feet from the point of entry. Full defect removal of discovered thin wall sections may result in a through wall defect. This case, and in those situations where a through wall defect is discovered, would result in the potential for in-leakage of groundwater into the pipe along with possible exposure to asbestos used in the external pipe wrap. Full defect removal for these cases presents a significant safety concern.

5. **Proposed Alternative and Basis for Use**
In lieu of the requirements of IWA-4422.1 discussed above, NextEra will not remove the degraded area prior to implementing an IWA-4000 repair. The corroded areas will be cleaned and assessed visually for signs of other damage mechanism, specifically the presence of cracking. If the degraded area appears consistent with no cracking present,

the area will be repaired by the application of an encapsulation device (Figure A) in accordance with the provisions of IWA-4000.

The structural repair consists of a 6" diameter circular encapsulation device designed to accommodate the design pressure as well as mechanical loading. Since welding of the cap will impact the capability of the exterior wrap to preclude outer diameter (OD) corrosion due to contact with ground water, no credit will be taken for the localized external wrap in determining the service life of the repair. The encapsulation cap ID will be such that the inside diameter is greater than the maximum diameter of the defective area plus a minimum of twice the nominal thickness of the pipe.

a. Materials and Installation

The material of the component to be repaired is concrete lined Standard Wall, Carbon Steel, SA 106, Grade B. The proposed encapsulation device material is SA 105 or SA 350 Grade LF2, while the welding process to be used in this repair is metal inert gas (MIG) with an ER 70S-6 weld wire.

The welding will be performed per the requirements of ASME Code, Section XI using qualified welders and the weld procedure will be qualified in accordance with ASME Code, Section XI.

b. Design Parameters

The applied encapsulation device is a pipe restoration approach equivalent to an unstayed flat head. ASME Section III, Subsection ND Figure ND-3325-1 depicts acceptable configurations for flat heads. The relevant configuration for the encapsulation device is shown in Figure b-2 of Figure ND-3325-1. The dimension of the cap top, skirt, and full penetration weld to the pipe are based upon the metal area replacement Code methodology and considers design pressure, external soil pressure, as well as mechanical loading. The size (outer diameter) of the cap considered the conservative assumption of future metal loss due to both seawater (internal content) and groundwater (external environment) during the period of service.

c. Non-Destructive Examination

Initial surface cleanup will be performed and a contour gauge will be used to determine the extent of wall loss. Upon discovery of a degraded area with pipe wall thickness less than Code required, further cleaning will be performed. UT examination will be used to establish that the existing surrounding area, consisting of good wall (sufficient wall thickness to support welding of the repair) is available. This UT examination will address the possible existence of external OD corrosion. Liquid penetrant or magnetic particle examination of the final attachment weld pass shall be performed. Its application results in a full Code approved structural repair with the exception being removal of the degraded material and resultant inaccessibility for future inspection.

d. Post Repair Monitoring Plan

Upon return to operation, and in consideration that the pipe is buried, post repair Monitoring is not possible. The repaired location will be placed into the NextEra Energy Seabrook Buried Pipe Inspection Program. A future excavation of the piping will be performed prior to the end of the 36 month service period for the purpose of defect removal from the exterior and repair of the external wrap.

e. Degradation Mechanism

Seabrook Station typically uses 30 mills per year (mpy) for a corrosion rate of carbon steel piping exposed to seawater. Based upon industry review, a conservative corrosion rate of 10 mpy is being used for the exterior of the carbon steel pipe subjected to groundwater. A total corrosion rate of 40 mpy will be used to ensure that the potential continued corrosion of the encapsulated pipe wall as well as the inner surface of the cap and its attachment welds remain intact during the intended service life of the repair. The 40 mpy is a conservative value as the pipe and encapsulation device that will be exposed to seawater inside the pipe will have a protective liner that will inhibit seawater degradation.

f. Applicable Loads

The encapsulation device will be designed to accommodate all appropriate deadweight, pressure, and seismic loads. Since the system is a moderate energy system which operates at a low temperature, differential thermal expansion between the encapsulation device and the repaired component is not a concern.

6. Duration of Proposed Alternative

Use of the relief request resulting in the installation of the internal encapsulation device will have a limited service life of two operating cycles (approximately 36 months). Encapsulation of the degraded area shall be used only once at each identified location.

7. Precedent

1. Indian Point Nuclear Generating Unit No. 3 – Relief Request (RR) No. RR-3-43 for Temporary Non-Code Repair of Service Water Pipe (ML080280073).

SEABROOK STATION UNIT 1
RELIEF REQUEST RA-12-001, REVISION 0
FIGURE A