NEXTera ENERGY SEABROOK

February 18, 2011

SBK-L-11027
Docket No. 50-443

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Seabrook Station
Response to Request for Additional Information
NextEra Energy Seabrook License Renewal Application
Request for Additional Information – Set 9

References:

1. NextEra Energy Seabrook, LLC letter SBK-L-10077, "Seabrook Station Application for Renewed Operating License," May 25, 2010. (Accession Number ML101590099)
2. NRC Letter "Request for Additional Information Related to the Review of the Seabrook Station License Renewal Application (TAC NO. ME4028) – Request for Additional Information Set 9" January 21, 2011 (Accession Number ML10070128)

In Reference 1, NextEra Energy Seabrook, LLC (NextEra) submitted an application for a renewed facility operating license for Seabrook Station Unit 1 in accordance with the Code of Federal Regulations, Title 10, Parts 50, 51, and 54.

In Reference 2, the NRC requested additional information in order to complete its review of the License Renewal Application (LRA). Enclosure 1 contains NextEra's response to the request for additional information and associated changes made to the LRA. For clarity, deleted LRA text is highlighted by strikethroughs and inserted texts highlighted by bold italics.

Based on discussion with the Staff, NextEra Energy Seabrook has made changes to LRA Appendix A – Updated FSAR Supplement that are contained in Enclosure 2 of this letter.

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Commitment number 62 is added to the License Renewal Commitment List. There are no other new or revised regulatory commitments contained in this letter. Enclosure 3 provides a revised LRA Appendix A - Final Safety Report Supplement Table A.3, License Renewal Commitment List, updated to reflect the license renewal commitment changes made in NextEra Energy Seabrook correspondence to date.

If there are any questions or additional information is needed, please contact Mr. Richard R.Cliche, License Renewal Project Manager, at (603) 773-7003.

If you have any questions regarding this correspondence, please contact Mr. Michael O'Keefe, Licensing Manager, at (603) 773-7745.

Sincerely,

NextEra Energy Seabrook, LLC.

Paul O. Freeman
Site Vice President

Enclosures:

Enclosure 1- Response to Request for Additional Information Seabrook Station License Renewal Application Aging Management Programs and Associated LRA Changes

Enclosure 2- Changes to the Seabrook Station License Renewal Application Associated with Appendix A – Updated FSAR Supplement

Enclosure 3- LRA Appendix A - Final Safety Report Supplement Table A.3, License Renewal Commitment List, updated to reflect the license renewal commitment changes made in NextEra Seabrook correspondence to date.

cc:

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NEXTera ENERGY
SEABROOK

I, Paul O. Freeman, Site Vice President of NextEra Energy Seabrook, LLC hereby affirm that the information and statements contained within are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

Sworn and Subscribed

Before me this

18th day of February, 2011

VICTORIA S. BROWN
MY COMMISSION EXPIRES DEC. 11, 2012
NOTARY PUBLIC
NEW HAMPSHIRE

Victoria S. Brown

Notary Public

Paul O. Freeman

Paul O. Freeman
Site Vice President

Enclosure 1 to SBK-L-11027

Response to Request for Additional Information

Seabrook Station License Renewal Application

Set 9 and Associated LRA Changes

Request for Additional Information (RAI) B.2.1.21-2

Background:

The Selective Leaching of Materials Program description in license renewal application (LRA) Section B.2.1.21 states that the applicant's program is a new program that manages the aging effects of loss of material due to selective leaching in components made of gray cast iron and copper alloys (with greater than 15 percent zinc) that are exposed to raw water, brackish water, treated water (including closed cycle cooling), or ground water. LRA Tables 3.4.2-1 and 3.4.2-3 list filter housings and valve bodies made of gray cast iron and copper alloy (greater than 15 percent zinc) that are exposed to the steam (internal) environment and rely on the Selective Leaching of Materials Program to manage loss of material.

Issue:

The environment of steam (internal) is not listed in the program description of B.2.1.21, Selective Leaching of Materials Program. While the staff believes that the inspection methodologies of the aging management program (AMP) will detect selective leaching due to exposure to steam, it is not clear to the staff whether the aging management review (AMR) line items are correct or the AMP description is correct in regard to the steam environment.

Request:

State whether LRA Tables 3.4.2-1 and 3.4.2-3, where steam (internal) is identified as an environment for components made of gray cast iron and copper alloys, are correct, or whether LRA Section B.2.1.21, where steam is not included as an environment for the Selective Leaching of Materials Program, is correct, and revise the LRA accordingly.

NextEra Energy Seabrook Response:

The reference to steam environments is correct in the LRA Tables 3.4.2-1 and 3.4.2-3. In response to this RAI, in Section B.2.1.21, "steam" has been added, as a form of treated water, to the environments applicable to selective leaching.

In Section B.2.1.21, on page B-121, the 1st paragraph of the Program Description is revised as follows:

The Seabrook Station Selective Leaching of Materials Program is a new program that manages the aging effect of loss of material due to selective leaching in components made of gray cast iron and copper alloys with greater than 15 percent zinc that are exposed to raw water, brackish water, treated water (including closed cycle cooling ***and steam***), or groundwater environment." Seabrook Station has also identified copper alloys with greater than 8 percent aluminum (e.g., aluminum bronze) as susceptible to selective leaching. Because NUREG-1801 does not include this material type, Seabrook Station has included it with the copper alloys with greater than 15 percent zinc components.

Request for Additional Information (RAI) B.2.1.21-3

Background:

Exception 1 of LRA Section B.2.1.21, Selective Leaching of Materials Program, states, in part, that the applicant would deploy additional examination methods that become available to the nuclear industry to determine if selective leaching is occurring on the surfaces of components.

Issue:

The staff does not have sufficient details on how the applicant would evaluate any process that might become available. Specifically, how would the applicant establish limitations on use of the process, and how would the process be qualified in order to detect selective leaching of the components. This information is needed for the staff to determine the acceptability of the process.

Request:

State how the new process will be evaluated and qualified in order to be able to detect selective leaching of material on the surfaces in components made of gray cast iron and copper alloys (greater than 15 percent zinc) exposed to environments of interest.

NextEra Energy Seabrook Response:

The terminology "...or additional examination methods that become available to the nuclear industry..." was included in anticipation of new technologies that may be available prior to implementation of this aging management program. In response to this RAI, reference to additional examination methods that may become available has been deleted from Section B.2.1.21.

1. In Section B.2.1.21, page B-122, the 3rd paragraph is revised as follows:

   "Visual inspection and mechanical examination techniques (Brinell hardness testing or other mechanical examination techniques such as destructive testing, when appropriate, scraping, chipping or other types of hardness testing)~~, or additional examination methods that become available to the nuclear industry,~~ will be used to determine if selective leaching is occurring on the surfaces of a selected set of components. NUREG-1801 XI.M33, "*Selective Leaching of Materials*," recommends that visual inspections be performed with Brinell hardness testing."

2. In Section B.2.1.21, page B-122, the 2nd paragraph in Exception 1 is revised as follows:

   "Seabrook Station will utilize visual inspections and mechanical examination techniques ~~[~~(Brinell hardness testing or other mechanical examination techniques such as destructive testing, ~~(where~~ ***when*** appropriate~~)~~, scraping, chipping or other types of hardness testing)~~], or additional examination methods that become available to the nuclear industry,~~ to determine if selective leaching is occurring on the surfaces of a selected set of components."

Request for Additional Information (RAI) 3.3.1.61-1

Background:

LRA Table 3.3.1, item 3.3.1-61, addresses elastomer fire barrier penetration seals exposed to air-outdoor or air-indoor uncontrolled which are being managed for increased hardness, shrinkage, and loss of strength due to weathering. The GALL Report recommends AMP XI.M26, "Fire Protection Program," to ensure that these aging effects are adequately managed for fire barrier elastomer seals. The associated AMR line items cite generic note A when they are managed by the Fire Protection Program and generic note E when they are managed by the Structures Monitoring Program. The components which cite generic note E and do not have a corresponding line item being managed by the Fire Protection Program are not fire barriers, but other types of elastomer seals, such as pressure or flood barriers.

Issue:

The staff noted that non-fire barrier elastomer seals may be constructed of materials that are subject to hardening and loss of strength due to exposure to ultraviolet light, radiation, or ozone. The staff also noted that if these elastomer seals are subject to hardening and loss of strength and exposed to ultraviolet light, radiation, or ozone, tactile examination techniques, such as scratching, bending, folding, stretching or pressing, should be performed in conjunction with visual examinations to manage the effects of aging. The applicant's Structures Monitoring Program does not include tactile examination techniques.

Request:

1) State whether the non-fire barrier elastomer seals being managed for aging by the Structures Monitoring Program are subject to hardening and loss of strength due to exposure to ultraviolet light, radiation, or ozone; and

2) If the materials are subject to hardening and loss of strength and exposed to these aging effects, state how the Structures Monitoring Program is adequate to manage aging for these components.

NextEra Energy Seabrook Response:

1) Structures Monitoring Program does manage non-fire barrier elastomer seals that are subject to aging effects of increased hardness, shrinkage and loss of strength for all environments including ultraviolet light, radiation, or ozone.

2) The License Renewal Structures Monitoring Program will perform a visual and tactile examination when required for non-fire barrier elastomer seals to ensure the seal's integrity. The AMP for the Structures Monitoring Program will be updated to provide tactile examination techniques for the non-fire barrier elastomer seals.

Request for Additional Information (RAI) 3.3.2.2.1-1

Background:

LRA Sections 3.2.2.2.1 and 3.3.2.2.1 address the applicant's AMR for managing cumulative fatigue damage in engineered safety features (ESF) systems and auxiliary (AUX) systems, respectively. The staff noted that these systems were analyzed to applicable fatigue analysis criteria in the ASME Code Section III for ASME Code Class 2 or 3 components, or in the ANSI B31.1 Code for ANSI B31.1 components (non-ASME Code Class 1 components). The time-limited aging analysis (TLAA) for non-ASME Code Class 1 components is documented in LRA Section 4.3.7 and the TLAA for crane load cycle limits is documented in LRA Section 4.7.6.

The GALL Report includes the following AMR items on management of cumulative fatigue damage in PWR ESF and AUX subsystems.

- AMR item 1 in Table 2 of GALL Report, Volume 1, references GALL AMR item V.D1-27, for management of cumulative fatigue damage in the piping, piping components and piping elements of the emergency core cooling systems.

- AMR item 1 in Table 3 of GALL Report, Volume 1, references GALL AMR item VII.B-2, for management of cumulative fatigue damage in steel cranes structural girders.

Issue:

LRA Section 4:3.7 describes fatigue-related TLAAs arising within design analyses of the Non-Class 1 piping and components. The staff noted that the AMR items associated with LRA Table 3.2.1, item 3.2.1-1, and LRA Table 3.3.1, item 3.3.1-1, are included in the LRA, however the Non-Class 1 piping and components for residual heat removal (RHR) and safety injection (SI) systems are not listed in the LRA Tables 3.2.2-3 and 3.2.2-4, respectively. Furthermore, the staff noted that those AMR line items in LRA Tables

3.2.2-3 and 3.2.2-4 that identify cumulative fatigue damage and reference a TLAA, are Class 1 components.

Similarly, LRA Section 4.7.6 states that evaluation of load cycles over the design life of the polar gantry and cask-handling cranes is the basis of a safety determination and is, therefore, a TLAA. The staff noted that AMR line items associated with steel crane girders reference LRA Table 3.3.1, item 3.3.1-1. Furthermore, only LRA Table 3.5.2-3 discusses AMR line items for fuel handling and overhead cranes. However, LRA Table 3.5.2-3 does not include any AMR lines items that are associated with metal fatigue TLAA of steel cranes structural girders or specifically reference LRA Table 3.3.1, item 3.3.1-1. The staff noted that LRA Sections 3.2.2.2.1 and 3.3.2.2.1 state that fatigue TLAA are required to be evaluated in accordance with 10 CFR 54.21(c), but the LRA does not include any AMR items associated with LRA Table 3.2.1, item 3.2.1-1, and LRA Table 3.3.1, item 3.3.1-1, in LRA Tables 3.2.2-3, 3.2.2-4 and 3.5.2-3.

Request:

Include the following in the LRA:

1) In LRA Table 3.2.2-3 for RHR system and LRA Table 3.2.2-4 for SI system, all AMR items related to a TLAA for managing cumulative fatigue damage in non-Class 1 components in the RHR and SI systems.

2) In LRA Table 3.5.2-3 for Fuel Handling and Overhead Cranes, all AMR items related to a TLAA for managing cumulative fatigue damage in the steel cranes structural girders.

Or provide the basis for excluding these AMR line items from the LRA.

NextEra Energy Seabrook Response:

1) Tables 3.2.2-3 and 3.2.2-4 should have shown TLAA lines that are aligned to V.D1-27 for the Residual Heat Removal and Safety Injection Systems.

Based on this discussion the followings changes are made in the Application.

1. In Table 3.2.2-3, on page 3.2-64, added a new row after the 2nd row as follows:

Orifice	*Pressure Boundary* *Throttle*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

2. In Table 3.2.2-3, on page 3.2-65, added a new row after the 2nd row as follows:

Piping and Fittings	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

3. In Table 3.2.2-3, on page 3.2-68, added a new row before the 1st row as follows:

Pump Casing	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

4. In Table 3.2.2-3, on page 3.2-68, added a new row after the 4th row as follows:

Thermowell	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

5. In Table 3.2.2-3, on page 3.2-68, added a new row after the 8th row as follows:

Valve Body	*Pressure Boundary*	*CASS*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

6. In Table 3.2.2-3, on page 3.2-69, added a new row after the 4th row as follows:

Valve Body	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

7. In Table 3.2.2-4, on page 3.2-75, added a new row after the 5th row as follows:

Orifice	*Pressure Boundary* *Throttle*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

8. In Table 3.2.2-4, on page 3.2-77, added a new row after the 2nd row as follows:

Piping and Fittings	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

9. In Table 3.2.2-4, on page 3.2-80, added a new row after the 3rd row as follows:

Pump Casing	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

10. In Table 3.2.2-4, on page 3.2-82, added a new row after the 1st row as follows:

Valve Body	*Pressure Boundary*	*CASS*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

11. In Table 3.2.2-4, on page 3.2-82, added a new row after the 5th row as follows:

Valve Body	*Pressure Boundary*	*Stainless Steel*	*Treated Borated Water (Internal)*	*Cumulative Fatigue Damage*	*TLAA*	*V.D1-27 (E-13)*	*3.2.1-1*	*A*

2) Items related to a TLAA for managing cumulative fatigue damage in steel crane structural girders for Fuel Handling and Overhead Cranes are added to Table 3.5.2-3.

Based on this discussion the followings changes are made in the Application.

1. In Table 3.5.2-3, on page 3.5-118, added a new row before the 1st row as follows:

1-FH-RE-1 Spent Fuel Cask Handling Crane Carbon Steel In Air Indoor Uncontrolled	*Structural Support*	*Steel*	*Air Indoor Uncontrolled (External)*	*Cumulative Fatigue Damage*	*TLAA*	*VII.B-2 (A-06)*	*3.3.1-1*	*A*

2. In Table 3.5.2-3, on page 3.5-122, added a new row after the 3rd row as follows:

1-MM-CR-3 Polar Gantry Crane Carbon Steel In Air Indoor Uncontrolled	*Structural Support*	*Steel*	*Air Indoor Uncontrolled (External)*	*Cumulative Fatigue Damage*	*TLAA*	*VII.B-2 (A-06)*	*3.3.1-1*	*A*

Request for Additional Information (RAI) 3.3.2.2.1-2

Background:

LRA Sections 3.2.2.2.1 and 3.3.2.2.1 address the applicant's AMR for managing cumulative fatigue damage in engineered safety features (ESF) systems and auxiliary (AUX) systems, respectively. The staff noted that these systems were analyzed to applicable fatigue analysis criteria in the ASME Code Section III for ASME Code Class 2 or 3 components or in the ANSI B31.1 Code for ANSI B31.1 components (non-ASME Code Class 1 components).

The GALL Report includes the following AMR items on management of cumulative fatigue damage in PWR ESF and AUX subsystems:

- AMR item 1 in Table 2 of GALL Report, Volume 1
- AMR item 1 and 2 in Table 3 of GALL Report, Volume 1

LRA Sections 3.2.2.2.1 and 3.3.2.2.1 state that fatigue TLAAs are required to be evaluated in accordance with 10 CFR 54.21 (c), however as discussed in RAI 3.3.2.2.1-1, the LRA Section 3.x.2 tables do not include AMR line items associated with items 3.2.1-1 and 3.3.1-1 for management of cumulative fatigue damage in PWR ESF and AUX subsystems.

Issue:

LRA Table 3.2.2-3 includes three AMR line items and LRA Table 3.2.2-4 includes five AMR line items associated with LRA Table 3.1.1, item 3.1.1-8, associated with TLAAs of piping and fittings {Class 1, Class 1 including <4 inch), valve body (Class 1) and orifice (Class 1). Also, LRA Table 3.3.2-3 includes two AMR line items associated with LRA Table 3.1.1, item 3.1.1-8, associated with TLAAs of valve body (Class 1) and piping and fittings (Class 1 including <4 inches).

LRA Section 4.3.7 states that the chemical volume control system (CVCS), RHR, and SI system components were designed in accordance with ASME Section III Class 2 and 3 requirements. It is not clear to the staff which piping and piping components are represented in these rows in LRA Tables 3.2.2-3, 3.2.2-4, and 3.3.2-3.

The staff further noted that GALL Report Section V.D1, "Emergency Core Cooling System (PWR)," states that portions of the RHR, and high-pressure and low-pressure SI systems extending from the reactor coolant system up to and including the second containment isolation valve associated with the primary coolant pressure boundary are governed by Regulatory Guide 1.26 Group A Quality Standards and covered in Section IV.C2 of the GALL Report. The LRA does not clarify whether the AMR items (3.1.1-8) in LRA Tables 3.3.2-3, 3.2.2-3, and 3.2.2-4 represent the portions of the CVCS, RHR, and SI systems, respectively, that are located inside the reactor containment.

Request:

1) Clarify which portions of the CVCS, RHR, and SI systems are represented by AMR items 3.1.1-8 in LRA Table 3.3.2-3 for the CVCS and LRA Tables 3.2.2-3 and 3.3.2-4 for RHR and SI systems.

2) Since LRA Table 3.1.1, item 3.1.1-8, represents Class 1 components, and the CVCS, RHR, and SI system components were designed to Class 2 and 3 requirements as discussed in LRA Section 4.3.7, (i) clarify the inconsistency between these two sections in the LRA and (ii) identify the TLAA, in LRA Section 4, for the metal fatigue analysis for these Class 1 components represented by these AMR items.

NextEra Energy Seabrook Response:

1) Line item 3.1.1-8 represents the Class 1 reactor coolant pressure boundary components in the Residual Heat Removal (Table 3.2.2-3), Safety Injection Systems (Table 3.2.2-4), and CVCS (Table 3.3.2-3) systems. The TLAA line items for Class 2 and 3 components in the RH and SI systems have been added in response to RAI 3.3.2.2.1-1. Line item 3.3.1-2, which represents the Class 2 and 3 components in the Chemical and Volume Control System, were already included in Table 3.3.2-3. Therefore, no changes were necessary to Table 3.3.2-3.

2) i) The Class 1 reactor coolant pressure boundary components in the Chemical and Volume Control, Residual Heat Removal, and Safety Injection Systems are part of the Nuclear Steam Supply System (NSSS) and are, evaluated in section 4.3.1 of the LRA [Nuclear Steam Supply System (NSSS) Pressure Vessel and Component Fatigue Analysis].

   ii) Chemical and Volume Control, Residual Heat Removal, and Safety Injection systems have ASME Section III, Class 1, 2, and 3 components. Metal Fatigue Analysis of Class 1 components is addressed in LRA section 4.3.1 and, 4.3.2. Metal Fatigue Analysis of Class 2 and 3 components is addressed in LRA section 4.3.7.

Request for Additional Information (RAI) 3.4.2.2-2

Background:

In LRA Table 3.4.1, items 3.4.1-8 and 3.4.1-31, the applicant stated that fouling is not an aging mechanism leading to loss of material in steel piping, piping components, piping elements, and heat exchanger components exposed to raw water because the raw water is associated with potable water from the town of Seabrook. The staff noted that the water from the town of Seabrook is extracted from wells and is chlorinated with sodium hypochlorite or calcium hypochlorite and, in wells with high iron and manganese, treated with polyphosphate to reduce plumbing fixture staining (Seabrook Water Department, "2009 Annual Report to Consumers on Water Quality"). The GALL Report Section IX.F states that fouling can occur due to biological activity and the deposition of sediment, silt, dust, and corrosion products.

Issue:

The staff noted that the water from the town of Seabrook used in the auxiliary steam condensate and auxiliary steam heating systems is not chemistry controlled on-site to ensure that the levels of additives are sufficient to prevent biological activity and deposition of iron and manganese mineral deposits. The staff also noted that the town of Seabrook does not guarantee the levels of water constituents at the present or during the period of the applicant's extended operation. The staff further noted that fouling by the deposition of sediment, silt, dust, and corrosion products is not precluded by the use of potable water.

Request:

State why the use of potable water from the town of Seabrook excludes fouling as an aging mechanism.

NextEra Energy Seabrook Response:

The potable water used at Seabrook Station is drinking water from the town of Seabrook. Fouling and loss of material due to fouling is not expected to occur in the drinking water at Seabrook Station.

The U.S. Environmental Protection Agency (EPA) has established National Primary Drinking Water Regulations that set mandatory water quality standards for drinking water contaminants. These are enforceable standards called "Maximum Contaminant Levels" or "MCLs", which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water, which is delivered to the consumer.

The U.S. Environmental Protection Agency (EPA) has also established National Secondary Drinking Water Regulations that set non-mandatory water quality standards for certain contaminants in drinking water. The EPA refers to these standards as "Secondary Maximum Contaminant Levels" or "SMCLs". One of the secondary contaminants is related to Total Dissolved Solids (TDS) in the drinking water, which could lead to sediment or deposit build up. The EPA recommended SMCL limit for TDS in drinking water is 500 mg/L. At Seabrook Station, the TDS levels in drinking water supplied from the town of Seabrook is periodically monitored. The seventeen measurements taken since 2003 have indicated that the highest measured TDS level was 350 mg/L, which is less than the maximum TDS level recommended by EPA.

The plant operating experience supports the determination that fouling and loss of material due to fouling in potable water is not a potential aging effect/mechanism at Seabrook Station. During the LRA preparation, a review of the Seabrook Station's corrective action program for operating experience related to potable water system was performed utilizing key words "potable and water", "potable and corrosion", "potable and deposit", "potable and fouling", "corrosion products", "deposit and internal", "fouling", "sediment", and "silt". This review showed no evidence of fouling or loss of material due to fouling in the Seabrook Station potable water environment.

In the LRA, Seabrook Station identified general, pitting, and crevice corrosion for steel piping, piping components, and piping elements exposed to raw water (potable) environment. The Seabrook Station's approach is consistent with NUREG-1801 Rev 2, which was recently issued in December of 2010. The previous revision of NUREG-1801 (Rev 1) did not address aging effects/mechanism for steel in raw water (potable) environment. However, NUREG-1801 Rev 2 now has a line item (VII.E5.AP-270) for steel in raw water (potable) environment and lists loss of material due to general, pitting, and crevice corrosion as the only applicable aging effects. Loss of material due to fouling is not listed as an applicable aging effect/mechanism in the potable water environment.

Request for Additional Information (RAI) 3.5.2.2.1.7-1

Background:

LRA Section 3.5.2.2.1.7, which is associated with LRA Table 3.5.1, item 3.5.1-10, addresses cracking due to stress corrosion cracking in stainless steel penetration sleeves, penetration bellows, and dissimilar metal welds. The applicant stated that its AMR results concluded that cracking due to stress corrosion cracking is not an aging effect requiring management for these components because both high temperature (>140 ^{o}F) and an aggressive environment, which are needed for stress corrosion cracking to initiate, are not simultaneously present for any of the components. The applicant also stated that reviews of plant-specific operating experience did not identify any stress corrosion cracking of these components.

In contrast, LRA Table 3.5.2-2 for containment structures indicates that stainless steel penetration components and bellows (mechanical penetration flued heads, electrical penetration assembly, fuel transfer tube bellows, and stainless steel shielding) are exposed to air-indoor uncontrolled and are subject to cracking due to stress corrosion cracking. LRA Table 3.5.2-2 also indicates that the applicant proposes the ASME Section XI, Subsection IWE Program to manage the aging effect for these components. In comparison, GALL Report Vol. 2, item II.A3-2 recommends the ASME Section XI, Subsection IWE Program, 10 CFR Part 50, Appendix J Program and augmented inspection to detect and manage the aging effect. The staff further noted that LRA Table 3.5.2-2 contains line items indicating that air with borated water leakage is an applicable environment for the stainless steel components.

Issue:

The staff noted that the applicant's AMR results described in LRA Table 3.5.2-2 are in conflict with the applicant's claim described in LRA Section 3.5.2.2.1.7 and LRA Table 3.5.1, item 3.5.1-10, that cracking due to stress corrosion cracking is not applicable for the stainless steel penetration components and bellows. The staff also found a need to further clarify whether the plant-specific environment of air with borated water leakage is conducive to stress corrosion cracking and whether the applicant's proposed program is adequate to detect and manage the aging effect.

Request:

1) Provide the technical basis for claiming that an aggressive environment that could contribute to stress corrosion cracking is not present for the stainless steel penetration components and bellows. As part of the response, provide the plant-specific operating experience of the borated water leaks including the leakage source, time periods of the water leaks and corrective actions. In addition, clarify whether the air with borated water leakage environment is conducive to stress corrosion cracking of the components taking into account the potential for leaked water contamination at the component surface as described in LRA Table 3.0-2.

2) Resolve the conflict between the AMR results described in LRA Section 3.5.2.2.1.7 and LRA Table 3.5.2-2 and clarify whether cracking due to stress corrosion cracking is applicable for the stainless steel penetration components and bellows.

3) If cracking due to stress corrosion cracking is applicable for the stainless steel penetration components or bellows as described in LRA Table 3.5.2-2, justify why the AMSE Section XI, Subsection IWE Program alone, without the 10 CFR Part 50, Appendix J Program and augmented inspection recommended in the GALL Report, is adequate to detect and manage the aging effect.

NextEra Energy Seabrook Response:

1) Upon review of LRA Table 3.5.2-2, line items that referenced LRA Table 3.5.1, item 3.5.1-10 were found to have been inadvertently included. Per LRA Section 3.5.2.2.1.7, the aging effect shown in these lines was determined to be not applicable at Seabrook Station. LRA Table 3.5.2-2 is changed to read as shown in response 2.

   During the Aging Management Review (AMR) process, Seabrook Station referenced EPRI TR 1015078, Structural Tools in determining that Stress Corrosion Cracking (SCC) of stainless steel Containment penetration components and bellows was not an aging effect requiring management. This was based on temperature and environmental limits. Although LRA Table 3.0-2 indicates that potential leakage water is considered untreated, the Containment internal environment does not contain sufficient contaminants to provide an environment conducive to SCC and the subject components are protected from the weather. Additionally, wetting from boric acid leakage is not a steady state environment; wetting is cleaned up or dries out in a short span of time.

Based on the EPRI discussion, Seabrook Station concludes that Stress Corrosion Cracking is not an aging effect requiring management for stainless steel penetration components and bellows inside Containment.

2) As reflected in LRA Section 3.5.2.2.1.7 and LRA Table 3.5.1 Item 10, cracking due to Stress Corrosion Cracking is not applicable for stainless steel components, including containment penetrations and bellows. Items associated with 3.5.1-10 have been removed from Table 3.5.2-2 (pages 3.5-101 thru 3.5-105), which now reads as follows:

In Table 3.5.2-2, on page 3.5-101, deletions as follows:

~~CNT-CS-Mechanical (Piping) Penetration Stainless Steel Flued Head Exposed to Air Indoor Uncontrolled~~	~~Structural Pressure Barrier~~	~~Stainless Steel~~	~~Air Indoor Uncontrolled (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~
~~CNT-CS-Mechanical (Piping) Penetration Stainless Steel Flued Head Exposed to Air Indoor Uncontrolled~~	~~Structural Support~~	~~Stainless Steel~~	~~Air Indoor Uncontrolled (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~

In Table 3.5.2-2, on page 3.5-103, deletions as follows:

~~CNT-CS-Stainless Steel Electrical Penetration Assembly Exposed to Air with Borated Water Leakage~~	~~Structural Pressure Barrier~~	~~Stainless Steel~~	~~Air w/Borated Water Leakage (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~

~~CNT-CS-Stainless Steel Electrical Penetration Assembly Exposed to Air with Borated Water Leakage~~	~~Structural Support~~	~~Stainless Steel~~	~~Air w/Borated Water Leakage (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~

In Table 3.5.2-2, on page 3.5-104, deletions as follows:

~~CNT-CS-Stainless Steel Exposed to Air Indoor Uncontrolled~~	~~Shielding~~	~~Stainless Steel~~	~~Air Indoor Uncontrolled (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~
~~CNT-CS-Stainless Steel Exposed to Air Indoor Uncontrolled~~	~~Structural Support~~	~~Stainless Steel~~	~~Air Indoor Uncontrolled (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~
~~CNT-CS-Stainless Steel Fuel Transfer Tube Bellows Exposed to Air with Borated Water Leakage~~	~~Expansion / Separation~~	~~Stainless Steel~~	~~Air w/Borated Water Leakage (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~
~~CNT-CS-Stainless Steel Fuel Transfer Tube Bellows Exposed to Air with Borated Water Leakage~~	~~Structural Pressure Barrier~~	~~Stainless Steel~~	~~Air w/Borated Water Leakage (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~

In Table 3.5.2-2, on page 3.5-105, deletions as follows:

~~CNT-CS-Stainless Steel Fuel Transfer Tube Exposed to Air with Borated Water Leakage~~	~~Structural Pressure Barrier~~	~~Stainless Steel~~	~~Air w/Borated Water Leakage (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~
~~CNT-CS-Stainless Steel Fuel Transfer Tube Exposed to Air with Borated Water Leakage~~	~~Structural Support~~	~~Stainless Steel~~	~~Air w/Borated Water Leakage (External)~~	~~Cracking~~	~~ASME Section XI, Subsection IWE Program~~	~~II.A3-2 (C-15)~~	~~3.5.1-10~~	~~A~~

3) Cracking due to Stress Corrosion Cracking is not applicable for the stainless steel penetration components or bellows and does not require aging management.

Request for Additional Information (RAI) 4.7.5-1

Background:

1) In LRA Section 4.7.5, the applicant stated that the fatigue analysis for the design of the 3 fuel transfer tube bellows is based on the consideration of 20 occurrences of the Operating Basis Earthquake (OBE).

   The applicant's UFSAR Section 3.8 states that the bellows were designed to withstand the following conditions:

   - 400 OBE cycles
   - 1 accident cycle (LOCA)
   - 160 pressure test cycles
   - 1000 temperature cycles

2) In LRA Appendix A, Section A.2.4.5.4, the applicant states that the fatigue analysis for each of the 3 bellows is based on the consideration of 20 occurrences of the OBE, each occurrence having 20 cycles of maximum response. The applicant further states that it is projected that 1 OBE would occur in 60 years of operation but further states that the number of occurrences projected for 60 years is below the design limit of 5 occurrences of 10 cycles.

Issue:

1) The staff compared the original design cycles listed in the UFSAR to the ones listed in the LRA Section 4.7.5 and is concerned that the LRA only includes fatigue analysis for OBE cycles and does not address the 1 accident cycle, 160 pressure test cycles, and 1000 temperature cycles that were included in the original fatigue design of the fuel transfer tube bellows.

2) The staff reviewed Appendix A of the LRA and is unclear as to the number of OBE design cycles included in the fuel transfer tube bellows design. LRA Appendix A states that the applicant included 20 occurrences of the OBE at 20 cycles each and then subsequently states that the design limit of 5 occurrences of 10 cycles. The staff reviewed the applicant's UFSAR and could not find information to confirm that the applicant used a design limit of 5 OBE occurrences at 10 cycles.

Request:

In order to complete its review, the staff needs the following information:

1) Provide information to show that all considerations included in the original fatigue design are addressed for the period of extended operation.

2) Verify the number of OBE cycles used for the fatigue analysis of the fuel transfer tube bellows design and resolve discrepancy between the UFSAR and the LRA with regard to number of OBE occurrences used in the original fatigue analysis.

<u>NextEra Energy Seabrook Response:</u>

1) As stated in LRA Section 4.6.2 the anticipated number of cycles for the Personnel Airlock, Equipment Hatch and Fuel Transfer Tube Assembly projected to occur during the period of extended operation is bounded by the original design. These cycles will be monitored by the enhanced cycle counting program referenced in Commitment 42. This includes the design limits specified in the UFSAR for OBE cycles, accident cycle (LOCA), pressure test cycles and temperature cycles. The number of temperature cycles is counted by monitoring to the number of Plant Heatup and Plant Cooldown cycles and the number of pressure test cycles is consistent with containment pressure testing. The accident cycle is counted as a faulted condition as listed in LRA Table 4.3.1-3.

2) The fatigue analysis for the fuel transfer tube bellows design is based on 20 occurrences of the OBE at 20 cycles each. This analysis is bounded by the plant design limit of 5 occurrences of 10 cycles. The plant design transient limit listed in LRA Table 4.3.1-3 is more limiting and therefore the acceptance criteria for the transient is monitored to a value lower than analyzed for individual components. Cycle counting limits of OBE is based on the overall plant design specified in LRA Table 4.3.1-3 of 50 cycles (5 occurrences of 10 cycles).

<u>Request for Additional Information (RAI) 3.3.1.46-1</u>

Background:

LRA Table 3.3.1, item 3.3.1-46, addresses stress corrosion cracking of stainless steel piping, piping components, piping elements, and heat exchangers exposed to closed-cycle cooling water at greater than 60°C (140 OF). The LRA states that this line item is not used and LRA Table 3.3.2-29 does not show any other line item that addresses stress corrosion cracking for the stainless steel components in the primary component cooling water system. UFSAR Table 9.2-7 indicates that the stainless steel thermal barrier loop heat exchangers, which are included in the primary component cooling water system, have inlet temperatures of 80°C (176.1 ^{o}F), creating the potential for stress corrosion cracking.

Issue:

Current licensing basis information indicates that stainless steel components in the primary component cooling water system, specifically in the thermal barrier loop, may be subjected to closed cycle cooling water at temperatures greater than 60°C (140 °F). However, the LRA neither addresses the potential for stress corrosion cracking of stainless steel components in the above system, nor provides sufficient information to justify the lack of potential.

Request:

Provide information to demonstrate that stainless steel components in the primary cooling water system, including the thermal barrier cooling water system, are not exposed to closed cycle cooling water greater than 60°C (140 °F), or provide information to demonstrate that there is no need to manage stress corrosion cracking of these components.

NextEra Energy Seabrook Response:

USFAR Table 9.2-7 provides the design data for the Primary Component Cooling Water system components. Page 4 of 5 of Table 9.2-7 provides the design data for the Thermal Barrier Loop heat exchangers. As stated on page 4 of 5 of UFSAR Table 9.2-7, the data provided in this table is for the Thermal Barrier Loop heat exchangers during an abnormal event. The data provided is following a Main Steam Line Break along with loss of one loop of Primary Component Cooling Water to one of the Thermal Barrier Loop heat exchangers and loss of normal seal injection to the Reactor Coolant pumps. During normal power operation, the Thermal Barrier Cooling Water is not exposed to closed-cycle cooling water greater than 140 °F. The Thermal Barrier Loop heat exchanger inlet temperature (shell side) is approximately 86 °F during normal power operation.

The above explanation is consistent with NUREG-1800, Section A.1 (Branch Technical Position RLSP-1), which states that the applicable aging effects to be considered for license renewal include those that could result from normal plant operation, including plant/system operating transients and plant shutdown. Specific aging effects from abnormal events need not be postulated for license renewal.

Request for Additional Information (RAI) B.2.1.12-7

Background:

The GALL AMP XI.M21 states that the Closed-Cycle Cooling Water System Program includes activities to minimize and monitor corrosion. In addition, SRP-LR item 3.3.1-49 addresses loss of material due to microbiologically influenced corrosion for stainless steel heat exchanger components exposed to closed cycle cooling water. LRA Section B.2.1.12 cites ERPI 1007820, which states, "Microbiologically Influenced or Induced Corrosion is one of the main problems in closed cooling water systems." LRA Section B.2.1.12 also describes the Closed Cycle Cooling Water System Program as managing loss of material due to general, crevice, pitting and galvanic corrosion, but does not include microbiologically influenced corrosion.

Issue:

It is not clear if the Closed-Cycle Cooling Water System Program manages aging from microbiologically influenced corrosion.

Request:

Clarify whether the Closed-Cycle Cooling Water System Program manages microbiologically influenced corrosion in the closed cycle cooling water systems, and either provide the bases for not needing to include this or the technical background on the 1) preventive actions, 2) parameters monitored, and 3) inspection techniques being conducted.

NextEra Energy Seabrook Response:

NUREG-1800, Rev. 1, Table 3.3.1, Item 49 does address loss of material due to microbiologically influenced corrosion in stainless steel and steel with stainless steel cladding heat exchanger components exposed to closed cycle cooling water. The referenced Related Item is shown as "A-67." The SRP, Section 3.3.3.1, states that the Related Item column identifies the item number in the GALL Report, Vol. 2, Chapters II through VIII, presenting detailed information summarized by this row. Item A-67 appears twice in the GALL Report, Vol. 2, Chapters II through VIII.

The first instance is Table VII.E3, item VII.E3-1. NUREG-1801, Rev. 1, Chapter VII is "Auxiliary Systems." Section E3 of this chapter is titled "Reactor Water Cleanup System (Boiling Water Reactor)," and states that the section "discusses the reactor water cleanup (RWCU) system, which provides for cleanup and particulate removal from the recirculating reactor coolant in all boiling water reactors (BWRs)."

The other instance of Item A-67 is in Table VII.E4, item VII.E4-1. Section E4 of this chapter is titled "Shutdown Cooling System (Older BWR)," and states that the section "discusses the shutdown cooling (SDC) system for older vintage boiling water reactors (BWRs) and consists of piping and fittings, the SDC system pump, the heat exchanger, and valves."

Neither instance of A-67 is applicable to Seabrook Station.

NUREG-1800, Rev. 2, which was recently issued in December of 2010, includes one item in Table 3.3-1 referencing microbiologically-influenced corrosion as an aging mechanism in closed-cycle cooling water. Item 47 addresses stainless steel and steel with stainless steel cladding heat exchanger components exposed to closed-cycle cooling water. This item is identified as Type "BWR" and shows Revision 1 Items VII.E3-1(A-67) and VII.E4-1(A-67).

Due to the stated lack of applicability to PWRs, and the additional absence of a similar aging mechanism for anything other than heat exchanger components in the GALL Reports (Rev 1 and Rev 2), Seabrook Station does not consider this to be a required aging management issue. Accordingly, the Seabrook Station's Closed-Cycle Cooling Water System Program does not manage loss of material due to microbiologically influenced corrosion.

Review of Seabrook Station operating experience performed during the preparation of the License Renewal aging management programs identified no history of microbiologically influence corrosion in the closed-cycle cooling water system.

Discussion of the monitoring for biological activity found in LRA Section B.2.1.12 is in the description of visual inspections performed when the system or components are opened for maintenance. The purpose of these inspections is to monitor for corrosion in the component cooling water systems. Biological activity levels are described in the EPRI Guideline as a Diagnostic Parameter (recommendation) instead of a Control Parameter (requirement). Diagnostic Parameters are described in the EPRI guidelines as recommended parameters that are "important to monitor the program effectiveness, identify programmatic problems, or assist in problem diagnosis". The Seabrook Station closed-cycle cooling chemistry control procedure includes biological activity as a Diagnostic Parameter in keeping with the guidelines provided by EPRI.

<u>Enclosure 2 to SBK-L- 11027</u>

Changes to the

Seabrook Station License Renewal Application

Associated with

Appendix A – Updated FSAR Supplement

Description of Changes

The following changes have been made to Appendix A of the Seabrook License Renewal Application (LRA):

1. Additional detail associated with the Compressed Air Monitoring Program described in LRA Appendix B, Section B.2.1.14, has been added to the UFSAR Supplement, Appendix A, Section A.2.1.14 (page A-11) as follows:

   A.2.1.14 COMPRESSED AIR MONITORING

   The Compressed Air Monitoring Program manages aging effects of hardening and loss of strength, loss of material, and reduction of heat transfer and assures an oil free, dry air environment in the plant compressed air system,
   Diesel Generator compressed air subsystem and containment compressed air system components.

   This program is in response to NRC GL 88-14 and INPO Significant Operating Experience Report (SOER) 88-01. It also relies on the ASME OM Guide Part 17, and ISA-S7.0.1-1996 as guidance for testing and monitoring air quality and moisture.

   A preventative maintenance program encompassing air system component inspection and repair has been in place since the system was initially placed in service. The program includes leak testing (monitoring) of system components.

   Seabrook Station committed to maintain instrument air quality in accordance with the Quality Standard for Instrument Air, ISA-S7.3; *"Quality Standard for Instrument Air"*. Compliance with ISA-S7.3 is verified by continuous monitoring or periodic testing. In-line dew point monitors are used to verify that the dew point of instrument air at the outlet of the instrument air system dryers is at or below a calculated limit. In-line filters are installed which limit air system maximum entrained particle size. These in-line filters meet or exceed the requirements of the quality standard. Periodic replacement of filters is part of the preventative maintenance program for instrument air systems. Air samples are obtained at least annually and tested for to ensure compliance with air quality standards.

2. As part of NextEra Energy Seabrook's response to RAI B.2.1.2-1, provided in Letter SBK-L-10204, dated December 17, 2010, the following commitment is added to the LRA Appendix A, Table A.3 - License Renewal Commitment List:

No.	*PROGRAM or TOPIC*	*COMMITMENT*	*UFSAR LOCATION*	*SCHEDULE*
62	***Water Chemistry***	***Enhance the program to include a statement that sampling frequencies are increased when chemistry action levels are exceeded.***	***A.2.1.2***	***Prior to the period of extended operation.***

<u>Enclosure 3 to SBK-L-11027</u>

LRA Appendix A - Final Safety Report Supplement

Table A.3 License Renewal Commitment List

A.3 LICENSE RENEWAL COMMITMENT LIST

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
1.	PWR Vessel Internals	An inspection plan for Reactor Vessel Internals will be submitted for NRC review and approval at least twenty-four months prior to entering the period of extended operation.	A.2.1.7	Program to be implemented prior to the period of extended operation. Inspection plan to be submitted to NRC not less than 24 months prior to the period of extended operation.
2.	Closed-Cycle Cooling Water	Enhance the program to include visual inspection for cracking, loss of material and fouling when the in-scope systems are opened for maintenance.	A.2.1.12	Prior to the period of extended operation
3.	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	Enhance the program to monitor general corrosion on the crane and trolley structural components and the effects of wear on the rails in the rail system.	A.2.1.13	Prior to the period of extended operation
4.	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	Enhance the program to list additional cranes for monitoring.	A.2.1.13	Prior to the period of extended operation
5.	Compressed Air Monitoring	Enhance the program to include an annual air quality test requirement for the Diesel Generator compressed air sub system.	A.2.1.14	Prior to the period of extended operation
6.	Fire Protection	Enhance the program to perform visual inspection of penetration seals by a fire protection qualified inspector.	A.2.1.15	Prior to the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
7.	Fire Protection	Enhance the program to add inspection requirements such as spalling, and loss of material caused by freeze-thaw, chemical attack, and reaction with aggregates by qualified inspector.	A.2.1.15	Prior to the period of extended operation.
8.	Fire Protection	Enhance the program to include the performance of visual inspection of fire-rated doors by a fire protection qualified inspector.	A.2.1.15	Prior to the period of extended operation.
9.	Fire Water System	Enhance the program to include NFPA 25 guidance for "where sprinklers have been in place for 50 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing".	A.2.1.16	Prior to the period of extended operation.
10.	Fire Water System	Enhance the program to include the performance of periodic flow testing of the fire water system in accordance with the guidance of NFPA 25.	A.2.1.16	Prior to the period of extended operation.
11.	Fire Water System	Enhance the program to include the performance of periodic visual or volumetric inspection of the internal surface of the fire protection system upon each entry to the system for routine or corrective maintenance. These inspections will be documented and trended to determine if a representative number of inspections have been performed prior to the period of extended operation. If a representative number of inspections have not been performed prior to the period of extended operation, focused inspections will be conducted. These inspections will be performed within ten years prior to the period of extended operation.	A.2.1.16	Within ten years prior to the period of extended operation.
12.	Aboveground Steel Tanks	Enhance the program to include components and aging effects required by the Aboveground Steel Tanks.	A.2.1.17	Prior to the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
13.	Aboveground Steel Tanks	Enhance the program to include an ultrasonic inspection and evaluation of the internal bottom surface of the two Fire Protection Water Storage Tanks.	A.2.1.17	Within ten years prior to the period of extended operation.
14.	Fuel Oil Chemistry	Enhance program to add requirements to 1) sample and analyze new fuel deliveries for biodiesel prior to offloading to the Auxiliary Boiler fuel oil storage tank and 2) periodically sample stored fuel in the Auxiliary Boiler fuel oil storage tank.	A.2.1.18	Prior to the period of extended operation.
15.	Fuel Oil Chemistry	Enhance the program to add requirements to check for the presence of water in the Auxiliary Boiler fuel oil storage tank at least once per quarter and to remove water as necessary.	A.2.1.18	Prior to the period of extended operation.
16.	Fuel Oil Chemistry	Enhance the program to require draining, cleaning and inspection of the diesel fire pump fuel oil day tanks on a frequency of at least once every ten years.	A.2.1.18	Prior to the period of extended operation.
17.	Fuel Oil Chemistry	Enhance the program to require ultrasonic thickness measurement of the tank bottom during the 10-year draining, cleaning and inspection of the Diesel Generator fuel oil storage tanks, Diesel Generator fuel oil day tanks, diesel fire pump fuel oil day tanks and auxiliary boiler fuel oil storage tank.	A.2.1.18	Prior to the period of extended operation.
18.	Reactor Vessel Surveillance	Enhance the program to specify that all pulled and tested capsules, unless discarded before August 31, 2000, are placed in storage.	A.2.1.19	Prior to the period of extended operation.
19.	Reactor Vessel Surveillance	Enhance the program to specify that if plant operations exceed the limitations or bounds defined by the Reactor Vessel Surveillance Program, such as operating at a lower cold leg temperature or higher fluence, the impact of plant operation changes on the extent of Reactor Vessel embrittlement will be evaluated and the NRC will	A.2.1.19	Prior to the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
		be notified.		
20.	Reactor Vessel Surveillance	Enhance the program as necessary to ensure the appropriate withdrawal schedule for capsules remaining in the vessel such that one capsule will be withdrawn at an outage in which the capsule receives a neutron fluence that meets the schedule requirements of 10 CFR 50 Appendix H and ASTM E185-82 and that bounds the 60-year fluence, and the remaining capsule(s) will be removed from the vessel unless determined to provide meaningful metallurgical data.	A.2.1.19	Prior to the period of extended operation.
21.	Reactor Vessel Surveillance	Enhance the program to ensure that any capsule removed, without the intent to test it, is stored in a manner which maintains it in a condition which would permit its future use, including during the period of extended operation.	A.2.1.19	Prior to the period of extended operation.
22.	One-Time Inspection	Implement the One Time Inspection Program.	A.2.1.20	Within ten years prior to the period of extended operation.
23.	Selective Leaching of Materials	Implement the Selective Leaching of Materials Program. The program will include a one-time inspection of selected components where selective leaching has not been identified and periodic inspections of selected components where selective leaching has been identified.	A.2.1.21	Within five years prior to the period of extended operation.
24.	Buried Piping And Tanks Inspection	Implement the Buried Piping And Tanks Inspection Program.	A.2.1.22	Within ten years prior to entering the period of extended operation

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
25.	One-Time Inspection of ASME Code Class 1 Small Bore-Piping	Implement the One-Time Inspection of ASME Code Class 1 Small Bore-Piping Program.	A.2.1.23	Within ten years prior to the period of extended operation.
26.	External Surfaces Monitoring	Enhance the program to specifically address the scope of the program, relevant degradation mechanisms and effects of interest, the refueling outage inspection frequency, the inspections of opportunity for possible corrosion under insulation, the training requirements for inspectors and the required periodic reviews to determine program effectiveness.	A.2.1.24	Prior to the period of extended operation.
27.	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	Implement the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program.	A.2.1.25	Prior to the period of extended operation.
28.	Lubricating Oil Analysis	Enhance the program to add required equipment, lube oil analysis required, sampling frequency, and periodic oil changes.	A.2.1.26	Prior to the period of extended operation.
29.	Lubricating Oil Analysis	Enhance the program to sample the oil for the Switchyard SF_6 compressors and the Reactor Coolant pump oil collection tanks.	A.2.1.26	Prior to the period of extended operation.
30.	Lubricating Oil Analysis	Enhance the program to require the performance of a one-time ultrasonic thickness measurement of the lower portion of the Reactor Coolant pump oil collection tanks prior to the period of extended operation.	A.2.1.26	Prior to the period of extended operation.
31.	ASME Section XI, Subsection IWL	Enhance procedure to include the definition of “Responsible Engineer”.	A.2.1.28	Prior to the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
32.	Structures Monitoring Program	Enhance procedure to add the aging effects, additional locations, inspection frequency and ultrasonic test requirements.	A.2.1.31	Prior to the period of extended operation.
33.	Structures Monitoring Program	Enhance procedure to include inspection of opportunity when planning excavation work that would expose inaccessible concrete.	A.2.1.31	Prior to the period of extended operation.
34.	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Implement the Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program.	A.2.1.32	Prior to the period of extended operation.
35.	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	Implement the Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits program.	A.2.1.33	Prior to the period of extended operation.
36.	Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Implement the Inaccessible Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program.	A.2.1.34	Prior to the period of extended operation.
37.	Metal Enclosed Bus	Implement the Metal Enclosed Bus program.	A.2.1.35	Prior to the period of extended operation.
38.	Fuse Holders	Implement the Fuse Holders program.	A.2.1.36	Prior to the period of extended operation.
39.	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental	Implement the Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program.	A.2.1.37	Prior to the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
	Qualification Requirements			
40.	345 KV SF_6 Bus	Implement the 345 KV SF_6 Bus program.	A.2.2.1	Prior to the period of extended operation.
41.	Metal Fatigue of Reactor Coolant Pressure Boundary	Enhance the program to include additional transients beyond those defined in the Technical Specifications and UFSAR.	A.2.3.1	Prior to the period of extended operation.
42.	Metal Fatigue of Reactor Coolant Pressure Boundary	Enhance the program to implement a software program, to count transients to monitor cumulative usage on selected components.	A.2.3.1	Prior to the period of extended operation.
43.	Pressure –Temperature Limits, including Low Temperature Overpressure Protection Limits	Seabrook Station will submit updates to the P-T curves and LTOP limits to the NRC at the appropriate time to comply with 10 CFR 50 Appendix G.	A.2.4.1.4	The updated analyses will be submitted at the appropriate time to comply with 10 CFR 50 Appendix G, Fracture Toughness Requirements.
44.	Environmentally-Assisted Fatigue Analyses (TLAA)	NextEra Seabrook will perform a review of design basis ASME Class 1 component fatigue evaluations to determine whether the NUREG/CR-6260-based components that have been evaluated for the effects of the reactor coolant environment on fatigue usage are the limiting components for the Seabrook plant configuration. If more limiting components are identified, the most limiting component will be evaluated for the effects of the reactor coolant environment on fatigue usage. If the limiting location identified consists of nickel alloy, the environmentally-assisted fatigue calculation for nickel alloy will be performed using the rules of NUREG/CR-6909.	A.2.4.2.3	At least two years prior to entering the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
		(1) Consistent with the Metal Fatigue of Reactor Coolant Pressure Boundary Program Seabrook Station will update the fatigue usage calculations using refined fatigue analyses, if necessary, to determine acceptable CUFs (i.e., less than 1.0) when accounting for the effects of the reactor water environment. This includes applying the appropriate F_{en} factors to valid CUFs determined from an existing fatigue analysis valid for the period of extended operation or from an analysis using an NRC-approved version of the ASME code or NRC-approved alternative (e.g., NRC-approved code case). (2) If acceptable CUFs cannot be demonstrated for all the selected locations, then additional plant-specific locations will be evaluated. For the additional plant-specific locations, if CUF, including environmental effects is greater than 1.0, then Corrective Actions will be initiated, in accordance with the Metal Fatigue of Reactor Coolant Pressure Boundary Program, B.2.3.1. Corrective Actions will include inspection, repair, or replacement of the affected locations before exceeding a CUF of 1.0 or the effects of fatigue will be managed by an inspection program that has been reviewed and approved by the NRC (e.g., periodic non-destructive examination of the affected locations at inspection intervals to be determined by a method accepted by the NRC).		
45.	Mechanical Equipment Qualification	Revise Mechanical Equipment Qualification Files.	A.2.4.5.9	Prior to the period of extended operation.
46.	Protective Coating Monitoring and Maintenance	Enhance the program by designating and qualifying an Inspector Coordinator and an Inspection Results Evaluator.	A.2.1.38	Prior to the period of extended operation
47.	Protective Coating Monitoring and Maintenance	Enhance the program by including, "Instruments and Equipment needed for inspection may include, but not be limited to, flashlight, spotlights, marker pen, mirror, measuring tape, magnifier, binoculars, camera with or	A.2.1.38	Prior to the period of extended operation

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
		without wide angle lens, and self sealing polyethylene sample bags."		
48.	Protective Coating Monitoring and Maintenance	Enhance the program to include a review of the previous two monitoring reports.	A.2.1.38	Prior to the period of extended operation
49.	Protective Coating Monitoring and Maintenance	Enhance the program to require that the inspection report is to be evaluated by the responsible evaluation personnel, who is to prepare a summary of findings and recommendations for future surveillance or repair.	A.2.1.38	Prior to the period of extended operation
50.	ASME Section XI, Subsection IWE	Perform testing of the containment liner plate for loss of material.	A.2.1.17	Prior to the period of extended operation.
51.	ASME Section XI, Subsection IWL	Perform confirmatory testing and evaluation of the Containment Structure concrete	A.2.1.28	Prior to the period of extended operation
52.	ASME Section XI, Subsection IWL	Implement measures to maintain the exterior surface of the Containment Structure, from elevation -30 feet to +20 feet, in a dewatered state.	A.2.1.28	Prior to the period of extended operation
53.	Reactor Head Closure Studs	Replace the spare reactor head closure stud(s) manufactured from the bar that has a yield strength > 150 ksi with ones that do not exceed 150 ksi.	A.2.1.3	Prior to the period of extended operation.
54.	Steam Generator Tube Integrity	Unless an alternate repair criteria changing the ASME code boundary is permanently approved by the NRC, or the Seabrook Station steam generators are changed to eliminate PWSCC-susceptible tube-to-tubesheet welds, submit a plant-specific aging management program to manage the potential aging effect of cracking due to PWSCC at least twenty-four months prior to entering the Period of Extended Operation.	A.2.1.10	Program to be submitted to NRC at least 24 months prior to the period of extended operation.

No.	PROGRAM or TOPIC	COMMITMENT	UFSAR LOCATION	SCHEDULE
55.	Steam Generator Tube Integrity	Seabrook will perform an inspection of each steam generator to assess the condition of the divider plate assembly unless operating experience and/or analytical results show that crack propagation into RCS pressure boundary is not possible, then the inspections need not be performed.	A.2.1.10	Prior to entering the period of extended operation
56.	Closed-Cycle Cooling Water System	Revise the station program documents to reflect the EPRI Guideline operating ranges and Action Level values for hydrazine and sulfates.	A.2.1.12	Prior to entering the period of extended operation.
57.	Closed-Cycle Cooling Water System	Revise the station program documents to reflect the EPRI Guideline operating ranges and Action Level values for Diesel Generator Cooling Water Jacket pH.	A.2.1.12	Prior to entering the period of extended operation.
58.	Fuel Oil Chemistry	Update Technical Requirement Program 5.1, (Diesel Fuel Oil Testing Program) ASTM standards to ASTM D2709-96 and ASTM D4057-95 required by the GALL XI.M30 Rev 1	A.2.1.18	Prior to the period of extended operation.
59.	Nickel Alloy Nozzles and Penetrations	The Nickel Alloy Aging Nozzles and Penetrations program will implement applicable Bulletins, Generic Letters, and staff accepted industry guidelines.	A.2.2.3	Prior to the period of extended operation.
60.	Buried Piping and Tanks Inspection	Implement the design change replacing the buried Auxiliary Boiler supply piping with a pipe-within-pipe configuration with leak indication capability.	A.2.1.22	Prior to entering the period of extended operation.
61.	Compressed Air Monitoring Program	Replace the flexible hoses associated with the Diesel Generator air compressors on a frequency of every 10 years.	A.2.1.14	Within ten years prior to entering the period of extended operation.
62.	***Water Chemistry***	***Enhance the program to include a statement that sampling frequencies are increased when chemistry action levels are exceeded.***	***A.2.1.2***	***Prior to the period of extended operation.***