NEXTera ENERGY SEABROOK

February 28, 2018
10 CFR 54
Docket No. 50-443
SBK-L-18028

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

Seabrook Station
Supplement 60 - Response to Final Requests for Additional Information for the Safety Review of the Seabrook Station License Renewal Application - ASME Section XI, Subsection IWL Program

References:

1. NextEra Energy Seabrook LLC, letter SBK-L-10077, "Seabrook Station Application for Renewed Operating License," May 25, 2010 (Accession Number ML101590099).

2. NextEra Energy Seabrook LLC, letter SBK-L-17108, "Supplement 56 – Revision to License Renewal ASME Section XI, Subsection IWL Program Operating Experience," July 20, 2017 (Accession Number ML17201A036).

3. NRC, "Final Requests for Additional Information for the Safety Review of the Seabrook Station License Renewal Application Docket No. 05-443," January 29, 2018 (Accession Number ML18026A879).

In Reference 1, NextEra Energy Seabrook, LLC (NextEra Energy Seabrook) 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, NextEra Energy Seabrook submitted letter SBK-L-17108 which revised License Renewal Application (LRA), Appendix B – Aging Management Programs, B.2.1.28 ASME Section XI, Subsection IWL, Operating Experience section. Changes reflected the summary of the most recent ASME Section XI, 5 year IWL inspection performed in 2016.

In Reference 3, the NRC requested additional information to complete the safety review of the License Renewal Application related to the ASME Section XI, Subsection IWL program.

Enclosure 1 provides NextEra Energy Seabrook's response to the NRC's Request for Additional Information concerning the License Renewal Application ASME Section XI, Subsection IWL program.

Enclosure 2 provides NextEra Energy Seabrook's revised License Renewal Application, Appendix B – Aging Management Programs, B.2.1.28 - ASME Section XI, Subsection IWL.

To facilitate understanding, the changes are explained, and where appropriate, portions of the LRA are repeated with the change highlighted by strikethroughs for deleted text and bolded italics for inserted text.

There is one new regulatory commitment contained in this letter, Commitment 55.

If there are any questions or additional information is needed, please contact Mr. Edward J. Carley, Engineering Supervisor - License Renewal, at (603) 773-7957.

If you have any questions regarding this correspondence, please contact Mr. Kenneth Browne, Licensing Manager, at (603) 773-7932.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 28, 2018.

Sincerely,

NextEra Energy Seabrook, LLC

Eric McCartney
Regional Vice President – Northern Region

**Enclosure 1:** Supplement 60 - Response to Final Requests for Additional Information for the Safety Review of the Seabrook Station License Renewal Application - ASME Section XI, Subsection IWL Program

**Enclosure 2:** NextEra Energy Seabrook's Revised License Renewal Application, Appendix B – Aging Management Programs, B.2.1.28 - ASME Section XI, Subsection IWL

**Enclosure 3:** LRA Appendix A - Final Safety Report Supplement Table A.3, License Renewal Commitment List Updated to Reflect Changes to Date

cc:

| | |
|---|---|
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**Enclosure 1 to SBK-L-18028**

Supplement 60 - Response to Final Requests for Additional Information for the Safety Review of the Seabrook Station License Renewal Application - ASME Section XI, Subsection IWL Program

Regulatory Background to RAI

Section 54.21(a)(3) of 10 CFR requires an applicant to demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation. As described in SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant. However, if an applicant takes credit for a program in the GALL Report, it is incumbent on the applicant to ensure that the conditions and operating experience at the plant are bounded by the conditions and operating experience for which the GALL Report program was evaluated. Ongoing evaluation of Operating Experience defines the effectiveness of an Aging Management Program.

RAI B.2.1.28-5

Background

GALL Report Revision 1 AMP, XI.S2, "ASME Section XI, Subsection IWL," states that ASME Code Section XI, Subsection IWL and the additional requirements of 10 CFR 50.55a(b)(2) constitute an existing mandated program applicable to manage the effects of aging of the containment concrete. To date, Seabrook has performed three IWL examinations, in 2000, 2010, and 2016. The 2010 IWL and 2016 IWL examinations were in accordance with ASME Code Section XI, 2004 Edition (ADAMS Accession Nos. ML16095A278 and ML17201A036, respectively).

IWL-2310 recommends general visual examination to identify areas of concrete deterioration and distress followed when necessary by detailed visual examination to determine the magnitude and extent of deterioration and distress of suspect concrete surface areas. To assist in the performance of the general visual examination and to assess the general condition of the concrete containment, the ASME Code references ACI 201.1R with ACI 349.3R providing tiered quantitative acceptance criteria to identify the magnitude and extent of adverse concrete conditions and help evaluate the structural integrity or require repairs to preserve structural function. The Seabrook Inservice Inspection Reference (SIIR) (ADAMS Accession No. ML11180A079) and its Containment Inservice Inspection (CISI) Plan are the implementing documents; and they identify areas of concrete inspection for Subsection IWL visual examinations.

In Supplement 56 to the LRA, the applicant revised the LRA AMP B.2.1.28 "operating experience" program element to report the operating experience from its 2016 IWL examination. The applicant stated that observed indications had no adverse impact on the structural integrity or structural performance of the containment structure and no ASME Code Repair activities were required as a result of the ASME IWL examination.

Issue

LRA Section B.2.1.28, as revised, proposes to identify ASR cracking through a visual pattern recognition method and tiered acceptance criteria reflective of ACI 349.3R but based on "Combined Cracking Index" (CCI) and/or on distinct individual crack widths, with "Tier 2" and

"Tier 3" requiring regular measurement and monitoring of cracking. Although Seabrook inspects, track and evaluates ASR indications in accordance with ACI 349.3 (ADAMS Accession No. ML12094A364), the SIIR for IWL "Examination Category L-A Concrete" specifies only general visual examinations for ASME identifier L1.11, "Concrete Surface-All Accessible Surface Areas" and does not appear to provide any specifications for ASME identifier L1.12, "Concrete Surface-Suspect Areas," which would require detailed visual examination. Furthermore, in LAR 16-01 ("Request to extend Containment Leakage Test Frequency," License Amendment Request 16-01 (ADAMS Accession No. ML16095A278)), the applicant stated that the CCI "met the action level criterion necessitating a structural evaluation."

The staff noted the following:

1. the applicant's LRA AMP B.2.1.28 for IWL Containment Inservice Inspection is augmented to include measuring CCI and crack widths for concrete affected by ASR (which measure magnitude/degree and extent of deterioration and distress);
2. measuring CCI and crack widths to measure magnitude/degree and extent of distress appears to meet the ASME guideline for detailed visual examination (beyond general visual examination);
3. the implementing documents for the IWL visual examinations (the SIIR and its CISI Plan), do not appear to include provisions for detailed visual examinations for concrete classified under the ASME identifier "Concrete Surface-Suspect Areas;"
4. if the program determines a need for measuring CCI and crack width(s) due to ASR degradation at "Tier 2" or "Tier 3" levels it is not clear whether the program criteria would classify those areas as "Concrete Surface-Suspect Areas" (and if not, it is not clear why not) and requiring detailed visual examination per the ASME Code; and
5. in LAR 16-01 the applicant identified that structural evaluation of containment concrete was necessary due to ASR degradation.

It is not clear how the applicant concluded in LRA Supplement 56 that the reported indications in the 2016 ASME IWL inspections did not adversely affect the structural integrity of the containment without having performed ASME Code Section XI mandated detailed visual examinations. The staff noted that the SIIR only specifies the general visual examination, which is limited to recognizing areas of concrete deterioration, and the SIIR does not specify detailed visual examinations. The CISI Plan as prescribed in the SIIR does identify any ASME identifier L1.12 "Concrete Surface-Suspect Areas" requiring detailed visual examinations. The fact that the applicant provided the conclusion that "indications did not adversely affect the structural integrity" of the containment implies that actions were taken to determine the magnitude and extent of ASR deterioration (i.e., CCI/crack widths), which would have been used to support the technical evaluation that validated the concrete containment structural integrity.

Request

1. Explain why Seabrook limits its IWL visual examinations to general visual, even though the requirements for IWL-2310 call for detail visual examinations to determine the magnitude and extent of deterioration and distress of suspect concrete surface areas?

2. Explain why the identified distressed concrete containment surface areas in the referenced LAR above have not been included as surface areas subject to detail visual examination and reported in the operating experience program element of LRA Section B.2.1.28.

3. State whether areas identified as "Tier 2" or "Tier 3" and requiring measurement of the extent of degradation by CCI and crack width are considered "suspect areas" per the ASME Code. If not, provide justification.

**NextEra Energy Seabrook's Response to RAI B.2.1.28-5, Request #1**

NextEra Energy Seabrook performs General Visual Examinations in accordance with the requirements of ASME Section XI, IWL-2310(a), and Table IWL-2500-1. General visual examinations of concrete surfaces are performed to assess the general structural condition of containment. The general visual examinations are performed in sufficient detail to identify areas of concrete deterioration and distress, such as described in ACI 201.1 and ACI 349.3R. The types of deterioration and distress include;

- Leaching and Chemical attack
- Abrasion, Erosion and Cavitations
- Drummy Areas (poorly consolidated concrete, with paste deficiencies)
- Popouts and Voids
- Scaling and/or Disintegration
- Spalling
- Cracks (>40 mils)
- Efflorescence, exudation and/or encrustation.
- Discoloration indicative of corrosion of embedded steel.
- Exposure of reinforcing steel.
- Ground Water In-leakage
- Cracking, blistering and/or peeling of coatings
- Deflections, settlements or other physical movements that may effect structural performance
- Alkali-Silica Reaction:
    - Pattern Cracking on the surface of the concrete
    - Secondary deposits at the pattern cracking location
    - Dark Staining adjacent to the cracks
    - Gel exudation in the cracks

NextEra Energy Seabrook performs Detailed Visual Examinations in accordance with the requirements of ASME Section XI, IWL-2310(b), and Table IWL-2500-1. Detailed visual examinations are performed to determine: a) the magnitude and extent of deterioration and distress of suspect concrete surfaces initially detected by General Visual examinations; b) the condition of concrete surfaces affected by repair/replacement activities prior to pressure testing; and c) the condition of reinforcing steel exposed as a result of removal of defective concrete during repair/replacement activities.

If the General Visual Examination does not reveal evidence of the above types of deterioration or distress, the surfaces are considered acceptable for continued service.

If the examination reveals evidence of the above types of deterioration or distress, a Detailed Visual Examination is performed, documented, and submitted to the Responsible Engineer for evaluation and disposition.

Acceptance of surface conditions by examination is defined in ASME IWL-3211 as conditions where the Responsible Engineer determines that there is no evidence of damage or degradation in the concrete sufficient to warrant further evaluation or the performance of Code Repair / Replacement activities. Conditions that do not meet the acceptance standards of ASME IWL-3211 require further evaluation in accordance with ASME IWL-3300.

**NextEra Energy Seabrook's Response to RAI B.2.1.28-5, Request #2**

License Amendment Request (LAR) 16-01 – Request to Extend Containment Leakage Frequency (ML16095A278), discusses the 2010 ASME Section XI, IWL inspection results. During the 2010 inspection, eighty-four (84) Suspect Areas were identified that required a detailed visual inspection and subsequent engineering evaluation. These 84 suspect areas were reviewed and evaluated by NextEra Energy Seabrook Design Engineering and accepted. Due to the types and magnitude of the indications, an ASME IWL-3300 Engineering Evaluation or Code Repair / Replacement activities were not required.

Commitment No. 55 has been created to ensure the results, specifically the Concrete Surface – Suspect Areas identified from the 2010 and 2016 ASME Section XI, IWL inspections are incorporated appropriately into the next revision of the Seabrook Station Containment Inservice Inspection (CISI) Plan.

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|---|---|---|---|---|
| *55* | *ASME Section XI, Subsection IWL* | *Concrete Surface Suspect areas identified during the 2010 and 2016 Containment IWL inspections will be incorporated into the Seabrook Station Containment Inservice Inspection (CISI) Plan.* | *A.2.1.28* | *September 1, 2020* |

Based on the responses above, the Seabrook Station License Renewal Application, Appendix B – B.2.1.28 ASME Section XI, Subsection IWL Program, has been revised and is shown in Enclosure 2.

**NextEra Energy Seabrook's Response to RAI B.2.1.28-5, Request #3**

During General Visual Examinations, if the following potential ASR indications are observed, a Detailed Visual Examination in accordance with the requirements of ASME Section XI, IWL-2310(b), and Table IWL-2500-1 is performed:

- Pattern Cracking on the surface of the concrete
- Secondary deposits at the pattern cracking location
- Dark Staining adjacent to the cracks
- Gel exudation in the cracks

The suspect areas of potential indications of ASR are then documented within the IWL examination indication inventory spreadsheet, and evaluated in accordance with the requirements of the Structures Monitoring Program. All potential ASR indications (as shown above and in Response to RAI #1), regardless of which "Tier" that was determined by the subsequent Structures Monitoring Program evaluation, are considered Suspect Areas.

Indications of ASR that are determined to be "Tier 2" or "Tier 3" are monitored and trended in accordance with the Structures Monitoring Program.

**Enclosure 2 to SBK-L-18028**

NextEra Energy Seabrook's Revised LRA, B.2.1.28 ASME Section XI, Subsection IWL

### B.2.1.28 ASME Section XI, Subsection IWL

**Program Description**

The Seabrook Station ASME Section XI, Subsection IWL Program is an existing program that manages the aging effects of cracking, loss of bond, loss of material (spalling, scaling) due to corrosion of embedded steel, expansion and cracking due to reaction with aggregates, increase in porosity and permeability, cracking, loss of material (spalling, scaling) due to aggressive chemical attack, and increase in porosity and permeability, loss of strength due to leaching of calcium hydroxide and invokes the requirements of ASME Section XI, Sub-Section IWL, "*Requirements for Class CC Concrete Components of Light-Water Cooled Power Plants*". The components managed by the program include steel reinforced concrete for the Seabrook Station containment building and complies with the requirement for examination contained in 10 CFR 50.55a in accordance with ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWL.

NUREG-1801, Rev 1, discusses the use of the 2001 edition including the 2002 and 2003 addenda of ASME Section XI code, but allows use of other editions of the ASME Code as long as there is justification. The Seabrook Station Inservice Inspection Program Plan for the current ten-year inspection interval, effective ***beginning*** ~~from August 19, 2000 through August 18, 2010~~ ***August 19, 2010***, approved per 10 CFR 50.55a, is based on the ~~1995~~ ***2004*** edition. ~~including the 1996 addenda~~. The next and subsequent 120-month inspection intervals for Seabrook Station will incorporate the requirements specified in the version of the ASME Code incorporated into 10 CFR 50.55a twelve months before the start of the inspection interval.

The primary inspection methods used at Seabrook Station are VT-1C visual examination, VT-3C visual examination and alternative examination methods (in accordance with IWA-2240). The Seabrook Station ASME Section XI, Subsection IWL Program provides acceptance criteria and corrective actions for each exam type.

As discussed in the NUREG-1801, Chapter 2, plants with aggressive groundwater/soil, and/or where the concrete structural elements have experienced degradation, a plant specific aging management program to account for the extent of the degradation experienced should be implemented to manage the concrete aging during the period of extended operation.

Concrete degradation due to aggressive chemical attack is an aging effect applicable to Seabrook Station. The Seabrook Station Structures Monitoring Program (B.2.1.31) addresses the plan and specific details to determine the effects of aggressive chemical attack on the concrete. An evaluation will be performed after the testing performed in the plan and, if required, actions will be provided using the corrective action process for concrete under Seabrook Station Structures Monitoring and ASME Section XI, Subsection IWL programs. The Seabrook Station containment is a steel reinforced concrete structure. No prestressed concrete or unbonded post-tensioning systems are used in the Seabrook Station containment. All accessible containment reinforced concrete components are within the scope of this program. Inaccessible containment concrete portions are exempted from examination (e.g., concrete covered by liner, foundation material, or backfill, or obstructed by adjacent structures or other components) as per Subsection IWL. 10 CFR 50.55a(b)(2)(viii) specifies additional

requirements for inaccessible areas. Seabrook Station will evaluate the acceptability of concrete in inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. Steel liners and their integral attachments are not within the scope of Subsection IWL, but are included within the scope of ASME Section XI, Subsection IWE (B.2.1.27).

The Seabrook Station ASME Section XI, Subsection IWL Program is an inspection program and no preventive actions are specified. Seabrook Station does not credit a coating program for managing the effects of aging of concrete surfaces.

Seabrook Station procedures provide instructions to perform ***General and Detailed*** visual examination***s*** of the concrete surfaces of the primary containment in accordance with requirements of ***ASME Section XI, IWL-2310(a) and (b) respectively, and Table IWL-2500-1*** ~~Subsection IWL-2500~~. Seabrook Station does not have concrete surfaces surrounding tendon anchors. ~~Concrete surfaces are inspected by VT-3C visual examination for evidence of damage or degradation such as;~~

~~a. Chemical attack, abrasion or erosion sufficient to expose coarse aggregate.~~
~~b. Water flowing from, or on the surface of, the concrete (except basement Annulus).~~
~~c. Scaling and/or disintegration sufficient to expose coarse aggregate.~~
~~d. Cracks, spalls, voids or popouts.~~
~~e. Efflorescence, exudation and/or encrustation.~~
~~f. Discoloration indicative of corrosion of embedded steel.~~
~~g. Exposure of reinforcing steel.~~
~~h. Cracking, blistering and/or peeling of coatings.~~

***General Visual Examinations (VT-3C) are performed in accordance with the requirements of ASME Section XI, IWL-2310(a), and Table IWL-2500-1. General visual examinations of concrete surfaces are performed to assess the general structural condition of containment. The general visual examinations are performed in sufficient detail to identify areas of concrete deterioration and distress, such as described in ACI 201.1 and ACI 349.3R. The types of deterioration and distress include;***

- ***Leaching and Chemical attack***
- ***Abrasion, Erosion and Cavitations***
- ***Drummy Areas (poorly consolidated concrete, with paste deficiencies)***
- ***Popouts and Voids***
- ***Scaling and/or Disintegration***
- ***Spalling***
- ***Cracks (>40 mils)***
- ***Efflorescence, exudation and/or encrustation.***
- ***Discoloration indicative of corrosion of embedded steel.***
- ***Exposure of reinforcing steel.***
- ***Ground Water In-leakage***
- ***Cracking, blistering and/or peeling of coatings***
- ***Deflections, settlements or other physical movements that may affect structural performance***
- ***Alkali-Silica Reaction:***

***- Pattern Cracking on the surface of the concrete***
***- Secondary deposits at the pattern cracking location***
***- Dark Staining adjacent to the cracks***
***- Gel exudation in the cracks***

***Detailed Visual Examinations (VT-1C) are performed in accordance with the requirements of ASME Section XI, IWL-2310(b), and Table IWL-2500-1. Detailed visual examinations are performed to determine: a) the magnitude and extent of deterioration and distress of suspect concrete surfaces initially detected by General Visual examinations; b) the condition of concrete surfaces affected by repair/replacement activities prior to pressure testing; and c) the condition of reinforcing steel exposed as a result of removal of defective concrete during repair/replacement activities.***

***Observed indications of ASR are evaluated in accordance with the requirements of the Structures Monitoring Program.***

The scope of examinations is in compliance with 10 CFR 50.55a and Subsection IWL to ensure that aging effects would be detected before they would compromise the design-basis requirements. The frequency of examinations is five years. All accessible concrete surfaces receive a VT-3C visual examination. Areas detected during the VT-3C exams that indicate suspect conditions, receive a more rigorous VT-1C examination ***(Detailed Visual Examination)***. These visual examination methods and testing would identify the aging effects of accessible concrete components at Seabrook Station containment.

Except in inaccessible areas, all concrete surfaces are monitored on a regular basis by virtue of the examination requirements. Seabrook Station procedures provide monitoring and trending information over the life of the plant. ***Results of the examinations are compared against any pre-service or baseline examinations (including ASR), and any prior inservice examination results.***

Acceptance criteria in accordance with IWL-3000 for concrete containment are provided in Seabrook Station procedures For concrete surfaces, the acceptance criteria rely on the determination of the "*Responsible Engineer*" regarding whether there is any evidence of damage or degradation sufficient to warrant further evaluation or repair in accordance with IWL-3300. The acceptance criteria are based on ACI-349.3R. Seabrook Station procedures also require that the Responsible Engineer be a registered professional engineer experienced in evaluating the inservice condition of structural concrete and knowledgeable of the design and construction codes and other criteria used in design and construction of concrete containments.

Repair activities are performed on the concrete containment as specified in Subsection IWL-4000. Testing performed following repair of modifications is done in accordance with Subsection IWL-5000.

The Containment Building, which is within the scope of the ASME Section XI, Subsection IWL, is also within the scope of the plant specific Alkali-Silica Reaction Monitoring Program. To manage the aging effects of cracking due to expansion and reaction with aggregates in concrete

structures, the existing ASME Section XI, Subsection IWL Program, B.2.1.28, and the Structures Monitoring Program, B.2.1.31, have been augmented by the plant specific Alkali-Silica Reaction Monitoring Program, B.2.1.31A.

Areas that have no indication of pattern cracking or water ingress (i.e. no visual presence of ASR) are considered acceptable (Tier 1). A Combined Cracking Index (CCI) of less than the 1.0 mm/m or Individual Crack Width of less than 1.0 mm can be deemed Acceptable with Deficiencies (Tier 2). Areas with deficiencies determined to be acceptable with further review are trended for evidence of further degradation. A CCI of 1.0 mm/m or greater, or an Individual Crack Width of 1.0 mm or greater are deemed Unacceptable and require further evaluation (Tier 3).

***Indications of ASR are monitored and trended in accordance with the Structures Monitoring Program.***

~~Tier 2 and Tier 3 locations are monitored and trended in accordance with the plant specific Alkali-Silica Reaction Monitoring Program, B.2.1.31A.~~

**NUREG-1801 Consistency**

NUREG-1801, Rev 1, discusses the use of the 2001 edition including the 2002 and 2003 addenda of ASME Section XI code, but allows use of other editions of the ASME Code as long as there is justification. The Seabrook Station Inservice Inspection Program Plan for the current ten-year inspection interval effective ***beginning*** ~~from~~ August 19, ~~2000~~ **2010** ~~through August 18, 2010~~, approved per 10 CFR 50.55a, is based on the ~~1995~~ ***2004*** edition~~, including the 1996 addenda~~. The next and subsequent 120-month inspection intervals for Seabrook Station will incorporate the requirements specified in the version of the ASME Code incorporated into 10 CFR 50.55a twelve months before the start of the inspection interval.

This program is consistent with NUREG-1801 XI.S2.

**Exceptions to NUREG-1801**

None

**Enhancements**

The following enhancement will be made prior to entering the period of extended operation.

1. The Seabrook Station ASME Section XI, Inservice Inspection, Subsection IWL Program implementing procedures will be enhanced to include the definition of *"Responsible Engineer"* (Registered Professional Engineer).

   *Program Elements Affected: Element 6 (Acceptance Criteria).*

2. Seabrook will implement measures to maintain the exterior surface of the Containment Structure, from elevation -30 feet to +20 feet, in a dewatered state. These measures will be in effect prior to the period of extended operation.

   *Program Elements Affected: Element 2 (Preventive Actions).*

3. ***NextEra Energy Seabrook will ensure the results, specifically the Concrete Surface – Suspect Areas identified from the 2010 and 2016 ASME Section XI, IWL inspections are incorporated appropriately into the next revision of the Seabrook Station Containment Inservice Inspection (CISI) Plan.***

   ***Program Elements Affected: Element 5 (Monitoring and Trending)***

**Operating Experience**

The Seabrook Station ASME Section XI, Subsection IWL Program is implemented through the Seabrook Station Containment Surface Inspection Program. Some of the results of the inspection conclusions are based on the following reviews:

1. Containment inspections performed during Refueling Outage 8 (Spring of 2002) were completed satisfactorily with no indication of degradation of the concrete surfaces.
2. Containment inspections performed during Refueling Outage 10 (Spring of 2005) were completed satisfactorily with no indication of degradation of the concrete surfaces.
3. Containment inspections performed during Refueling Outage 12 (Spring of 2008) were completed satisfactorily with no indication of degradation of the concrete surfaces.
4. ***During the 2010 IWL inspection, eighty-four (84) Concrete Surface - Suspect Areas were identified that required detailed visual inspection and an engineering evaluation. Each of the reported discontinuities in the Containment concrete were individually reviewed and evaluated by Design Engineering. The discontinuities were categorized as; popouts, voids, hairline cracks < 40 mils, scaling, spalling and drummy areas. One crack was identified with a width greater than 40 mils and a limited length of 1 inch. All of the reported discontinuities were accepted-as-is with no further technical evaluation or remediation.***

   ***During walkdown assessments of the containment as part of the Structural Monitoring Program, four isolated locations were identified where the concrete had pattern cracking, which is typical of Alkali-Silica Reaction (ASR). Three locations were at the lower elevations where water in ingress into the Containment Enclosure Building (CEB) led to direct exposure of the outer surface of containment to water. The fourth location was in the Mechanical Penetration Area which did include evidence of water intrusion at the seismic isolation joint. At one location, the Combined Cracking Index (CCI) met the action level criterion in the Structures Monitoring Program, necessitating a structural evaluation. Seabrook has committed to maintain the exterior surface***

***of the Containment Structure, from elevation -30 feet to +20 feet, in a dewatered state. Continued monitoring per the Structures Monitoring Program will identify any further expansion attributed to ASR.***

5. Containment ASME IWL inspections were completed on 10/11/2016. ***A total of 1378 indications were reported on the Detailed Visual Examination Reports and documented on the IWL examination indication inventory spreadsheet. The indications were entered into the Corrective Action Program for an aggregate review and evaluation due to the large difference in the number of identified indications from the previous examination in 2010.*** Seabrook Station Design Engineering evaluated the reported indications ***that were determined to require an Engineering Evaluation per ASME IWL-3300,*** and determined that none of the indications have an adverse impact on the structural integrity or structural performance of the Containment structure. No ASME Code Repair activities were required as a result of this ASME IWL examination. ***The IWL indication inventory spreadsheet identified 82 locations that exhibit cracking and other features typically associated with ASR distress, which required further engineering evaluation.***

   ***All locations on Containment that exhibit features suggestive of ASR or indicative of ASR will be monitored per the Structures Monitoring Program. There was no change to the ASME IWL-2400, 5-year examination frequency since no Code Repair / Replacement activities were required, and except for ASR indications, all other identified indications are passive in nature.***

**Enclosure 3 to SBK-L-18028**

LRA Appendix A - Final Safety Analysis Report Supplement Table A.3,
License Renewal Commitment List Updated to Reflect Changes to Date

# A.3 LICENSE RENEWAL COMMITMENT LIST

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 1. | PWR Vessel Internals | Provide confirmation and acceptability of the implementation of MRP-227-A by addressing the plant-specific Applicant/Licensee Action Items outlined in section 4.2 of the NRC SER. | A.2.1.7 | Complete |
| 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. |
| 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. |

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| 9. | Fire Water System | Enhance the program to include NFPA 25 (2011 Edition) 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 (2011 Edition). | 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 to evaluate wall thickness and inner diameter of the fire protection piping ensuring that corrosion product buildup will not result in flow blockage due to fouling. Where surface irregularities are detected, follow-up volumetric examinations are performed. 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 commence during the ten year period prior to the period of extended operation and continue through the period of extended operation | A.2.1.16 | Within ten years prior to the period of extended operation. |

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| 12. | Aboveground Steel Tanks | Enhance the program to include 1) In-scope outdoor tanks, except fire water storage tanks, constructed on soil or concrete, 2) Indoor large volume storage tanks (greater than 100,000 gallons) designed to near-atmospheric internal pressures, sit on concrete or soil, and exposed internally to water, 3) Visual, surface, and volumetric examinations of the outside and inside surfaces for managing the aging effects of loss of material and cracking, 4) External visual examinations to monitor degradation of the protective paint or coating, and 5) Inspection of sealant and caulking for degradation by performing visual and tactile examination (manual manipulation) consisting of pressing on the sealant or caulking to detect a reduction in the resiliency and pliability. | A.2.1.17 | Within 10 years prior to the period of extended operation. |
| 13. | Fire Water System | Enhance the program to perform exterior inspection of the fire water storage tanks annually for signs of degradation and include an ultrasonic inspection and evaluation of the internal bottom surface of the two Fire Protection Water Storage Tanks per the guidance provided in NFPA 25 (2011 Edition). | A.2.1.16 | 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. |

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| 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 be notified. | A.2.1.19 | Prior to the period of extended operation. |
| 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. |

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| 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 the period of extended operation |
| 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 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 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. |

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| 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. |

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| 39. | Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements | 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. |
| 40. | 345 KV SF6 Bus | Implement the 345 KV SF6 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. |

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| 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.<br><br>(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 Fen 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).<br><br>(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). | A.2.4.2.3 | At least two years prior to the period of extended operation. |

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| 45. | Alkali-Silica Reaction (ASR) Monitoring Program | NextEra will obtain additional cores in the vicinity of 20% of the extensometers and perform modulus testing. Using these test results, NextEra will determine the change in through-thickness expansion since installation of the extensometers and compare it to change determined from extensometer readings. Consistency between these results will provide additional corroboration of the methodology in MPR-4153. | A.2.1.31.A | At least 5 years prior to the period of extended operation (initial study) and 10 years thereafter (follow-up study). |
| 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 without wide angle lens, and self sealing polyethylene sample bags." | A.2.1.38 | Prior to the period of extended operation. |
| 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 UT of the accessible areas of the containment liner plate in the vicinity of the moisture barrier for loss of material. Perform opportunistic UT of inaccessible areas. | A.2.1.27 | Baseline inspections were completed during OR16. Repeat containment liner UT thickness examinations at intervals of no more than five (5) refueling outages. |

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| 51. | Bolting Integrity | Enhance the program to manage the aging effects for closure bolting within air and gas filled systems by using an applicable inspection technique that ensures the integrity of bolted joints will be demonstrated.<br>For closure bolting within systems at atmospheric pressure, tightness checks will be performed on 20 percent of bolts with a maximum of 25 bolts per population. Populations will be of the same material and environment combination. Inspections will occur before the period of extended operation, and then every 10 years after the initial inspection date. | A.2.1.9 | 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 | Complete |
| 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. |

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| 54. | Steam Generator Tube Integrity | NextEra will address the potential for cracking of the primary to secondary pressure boundary due to PWSCC of tube-to-tubesheet welds using one of the following two options:<br>1) Perform a one-time inspection of a representative sample of tube-to-tubesheet welds in all steam generators to determine if PWSCC cracking is present and, if cracking is identified, resolve the condition through engineering evaluation justifying continued operation or repair the condition, as appropriate, and establish an ongoing monitoring program to perform routine tube-to-tubesheet weld inspections for the remaining life of the steam generators, or<br>2) Perform an analytical evaluation showing that the structural integrity of the steam generator tube-to-tubesheet interface is adequately maintaining the pressure boundary in the presence of tube-to-tubesheet weld cracking, or redefining the pressure boundary in which the tube-to-tubesheet weld is no longer included and, therefore, is not required for reactor coolant pressure boundary function. The redefinition of the reactor coolant pressure boundary must be approved by the NRC as part of a license amendment request. | A.2.1.10 | Complete |
| 55. | ~~Number Not Used~~<br>***ASME Section XI, Subsection IWL*** | ***Concrete Surface Suspect areas identified during the 2010 and 2016 Containment IWL inspections will be incorporated into the Seabrook Station Containment Inservice Inspection (CISI) Plan.*** | ***A.2.1.28*** | ***September 1, 2020*** |
| 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 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 the period of extended operation. |

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| 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 detection capability. | A.2.1.22 | Prior to 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 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. |
| 63. | Flow Induced Erosion | Ensure that the quarterly CVCS Charging Pump testing is continued during the PEO. Additionally, add a precaution to the test procedure to state that an increase in the CVCS Charging Pump mini flow above the acceptance criteria may be indicative of erosion of the mini flow orifice as described in LER 50-275/94-023. | A.2.1.2 | Prior to the period of extended operation. |
| 64. | Buried Piping and Tanks Inspection | Soil analysis shall be performed prior to entering the period of extended operation to determine the corrosivity of the soil in the vicinity of non-cathodically protected steel pipe within the scope of this program. If the initial analysis shows the soil to be non-corrosive, this analysis will be re-performed every ten years thereafter. | A.2.1.22 | Within ten years prior to the period of extended operation. |
| 65. | Flux Thimble Tube | Implement measures to ensure that the movable incore detectors are not returned to service during the period of extended operation. | N/A | Complete. |

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| 66. | Alkali-Silica Reaction (ASR) Monitoring Program | NextEra will perform an integrated review of expansion trends at Seabrook Station by conducting a periodic assessment of ASR expansion behavior to confirm that the MPR/FSEL large-scale test programs remain applicable to plant structures. This review will include the following specific considerations:<br>• Review of all cores removed to date for trends of any indications of mid-plane cracking.<br>• Comparison of in-plane expansion to through-thickness expansion of all monitored points by plotting these data on a graph of in-plane expansion versus through-thickness expansion.<br>• Comparison of in-plane expansions, volumetric expansions, and through-thickness expansions recorded to date to the limits from the MPR/FSEL large-scale test programs and check of margin for future expansion. | A.2.1.31.A | At least 5 years prior to the period of extended operation and every 10 years thereafter. |
| 67. | Structures Monitoring Program | Perform one shallow core bore in an area that was continuously wetted from borated water to be examined for concrete degradation and also expose rebar to detect any degradation such as loss of material. The removed core will also be subjected to petrographic examination for concrete degradation due to ASR per ASTM Standard Practice C856. | A.2.1.31 | Complete |
| 68. | Structures Monitoring Program | Perform sampling at the leak off collection points for chlorides, sulfates, pH and iron once every three months. | A.2.1.31 | Complete |
| 69. | Open-Cycle Cooling Water System | Replace the Diesel Generator Heat Exchanger Plastisol PVC lined Service Water piping with piping fabricated from AL6XN material. | A.2.1.11 | Complete |
| 70. | Closed-Cycle Cooling Water System | Inspect the piping downstream of CC-V-444 and CC-V-446 to determine whether the loss of material due to cavitation induced erosion has been eliminated or whether this remains an issue in the primary component cooling water system. | A.2.1.12 | Within ten years prior to the period of extended operation. |

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| 71. | Alkali-Silica Reaction (ASR) Monitoring Program / Building Deformation Monitoring Program | NextEra has completed testing at the University of Texas Ferguson Structural Engineering Laboratory which demonstrates the parameters being monitored and acceptance criteria used are appropriate to manage the effects of ASR.<br>NextEra Implement the Alkali-Silica Reaction (ASR) Monitoring Program and Building Deformation Monitoring Program described in B.2.1.31A and B.2.1.31B of the License Renewal Application. | A.2.1.31A<br>A.2.1.31B | Prior to the period of extended operation. |
| 72. | Flow-Accelerated Corrosion | Enhance the program to include management of wall thinning caused by mechanisms other than FAC. | A.2.1.8 | Prior to the period of extended operation. |
| 73. | Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components | Enhance the program to include performance of focused examinations to provide a representative sample of 20%, or a maximum of 25, of each identified material, environment, and aging effect combinations during each 10 year period in the period of extended operation. | A.2.1.25 | Prior to the period of extended operation. |
| 74. | Fire Water System | Enhance the program to perform sprinkler inspections annually per the guidance provided in NFPA 25 (2011 Edition). Inspection will ensure that sprinklers are free of corrosion, foreign materials, paint, and physical damage and installed in the proper orientation (e.g., upright, pendant, or sidewall). Any sprinkler that is painted, corroded, damaged, loaded, or in the improper orientation, and any glass bulb sprinkler where the bulb has emptied, will be evaluated for replacement. | A.2.1.16 | Prior to the period of extended operation. |

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| 75. | Fire Water System | Enhance the program to a) conduct an inspection of piping and branch line conditions every 5 years by opening a flushing connection at the end of one main and by removing a sprinkler toward the end of one branch line for the purpose of inspecting for the presence of foreign organic and inorganic material per the guidance provided in NFPA 25 (2011 Edition) and b) If the presence of sufficient foreign organic or inorganic material to obstruct pipe or sprinklers is detected during pipe inspections, the material will be removed and its source is determined and corrected.<br><br>In buildings having multiple wet pipe systems, every other system shall have an internal inspection of piping every 5 years as described in NFPA 25 (2011 Edition), Section 14.2.2. | A.2.1.16 | Prior to the period of extended operation. |
| 76. | Fire Water System | Enhance the Program to conduct the following activities annually per the guidance provided in NFPA 25 (2011 Edition).<br>• main drain tests<br>• deluge valve trip tests<br>• fire water storage tank exterior surface inspections | A.2.1.16 | Prior to the period of extended operation. |
| 77. | Fire Water System | The Fire Water System Program will be enhanced to include the following requirements related to the main drain testing per the guidance provided in NFPA 25 (2011 Edition).<br>• The requirement that if there is a 10 percent reduction in full flow pressure when compared to the original acceptance tests or previously performed tests, the cause of the reduction shall be identified and corrected if necessary.<br>• Recording the time taken for the supply water pressure to return to the original static (nonflowing) pressure. | A.2.1.16 | Prior to the period of extended operation. |

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| 78. | External Surfaces Monitoring | Enhance the program to include periodic inspections of in-scope insulated components for possible corrosion under insulation. A sample of outdoor component surfaces that are insulated and a sample of indoor insulated components exposed to condensation (due to the in-scope component being operated below the dew point), will be periodically inspected every 10 years during the period of extended operation. | A.2.1.24 | Prior to the period of extended operation. |
| 79. | Open-Cycle Cooling Water System | Enhance the program to include visual inspection of internal coatings/linings for loss of coating integrity. | A.2.1.11 | Within 10 years prior to the period of extended operation. |
| 80. | Fire Water System | Enhance the program to include visual inspection of internal coatings/linings for loss of coating integrity. | A.2.1.16 | Within 10 years prior to the period of extended operation. |
| 81. | Fuel Oil Chemistry | Enhance the program to include visual inspection of internal coatings/linings for loss of coating integrity. | A.2.1.18 | Within 10 years prior to the period of extended operation. |
| 82. | Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components | Enhance the program to include visual inspection of internal coatings/linings for loss of coating integrity. | A.2.1.25 | Within 10 years prior to the period of extended operation. |
| 83. | Alkali-Silica Reaction Monitoring | Enhance the ASR AMP to install extensometers in all Tier 3 areas of two dimensional reinforced structures to monitor expansion due to alkali-silica reaction in the out-of-plane direction.<br>Monitoring expansion in the out-of-plane direction will commence upon installation of the extensometers and continue on a six month frequency through the period of extended operation. | A.2.1.31A | Complete |
| 84. | ASME Section XI, Subsection IWL | Evaluate the acceptability of inaccessible areas for structures within the scope of ASME Section XI, Subsection IWL Program. | A.2.1.28 | Prior to the period of extended operation. |

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| 85. | Fire Water System | Enhance the program to perform additional tests and inspections on the Fire Water Storage Tanks as specified in Section 9.2.7 of NFPA 25 (2011 Edition) in the event that it is required by Section 9.2.6.4, which states "Steel tanks exhibiting signs of interior pitting, corrosion, or failure of coating shall be tested in accordance with 9.2.7." | A.2.1.16 | Prior to the period of extended operation. |
| 86. | Fire Water System | Enhance the program to include disassembly, inspection, and cleaning of the mainline strainers every 5 years. | A.2.1.16 | Prior to the period of extended operation. |
| 87. | Fire Water System | Increase the frequency of the Open Head Spray Nozzle Air Flow Test from every 3 years to every refueling outage to be consistent with LR-ISG-2012-02, AMP XI.M27, Table 4a. | A.2.1.16 | Prior to the period of extended operation. |
| 88. | Fire Water System | Enhance the program to include verification that a) the drain holes associated with the transformer deluge system are draining to ensure complete drainage of the system after each test, b) the deluge system drains and associated piping are configured to completely drain the piping, and c) normally-dry piping that could have been wetted by inadvertent system actuations or those that occur after a fire are restored to a dry state as part of the suppression system restoration. | A.2.1.16 | Within five years prior to the period of extended operation. |
| 89. | Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components | Incorporate Coating Service Level III requirements into the RCP Motor Refurbishment Specification for the internal painting of the motor upper bearing coolers and motor air coolers. All four RCP motors will be refurbished and replaced using the Coating Service Level III requirements prior to entering the period of extended operation. | A.2.1.25 | Prior to the period of extended operation. |
| 90. | PWR Vessel Internals | Implement the PWR Vessel Internals Program. The program will be implemented in accordance with MRP-227-A (Pressurized Water Reactor Internals Inspection and Evaluation Guidelines) and NEI 03-08 (Guideline for the Management of Materials Issues). | A.2.1.7 | Prior to the period of extended operation |

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| 91 | Building Deformation Monitoring | Implement the Building Deformation Monitoring Program<br><br>Enhance the Structures Monitoring Program to require structural evaluations be performed on buildings and components affected by deformation as necessary to ensure that the structural function is maintained. Evaluations of structures will validate structural performance against the design basis, and may use results from the large-scale test programs, as appropriate. Evaluations for structural deformation will also consider the impact to functionality of affected systems and components (e.g., conduit expansion joints). NextEra will evaluate the specific circumstances against the design basis of the affected system or component.<br><br>Enhance the Building Deformation AMP to include additional parameters to be monitored based on the results of the CEB Root Cause, Structural Evaluation and walk downs. Additional parameters monitored will include: alignment of ducting, conduit, and piping; seal integrity; laser target measurements; key seismic gap measurements; and additional instrumentation.<br><br>Develop a design standard to implement Aging Management Program B.2.1.31B Building Deformation, Program Element 3 - Parameters Monitored/Inspected. The design standard will clarify the deformation evaluation process and provide an auditable format to assess it. The design standard will include steps for each of the three evaluation stages that include parameters monitored, basis for why the parameter is monitored, and conditions that prompts action for the subsequent step. | A.2.1.31B | March 15, 2020 |