NEXTera ENERGY SEABROOK

October 29, 2010

SBK-L-10179

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
Supplement to the NextEra Energy Seabrook, LLC
Seabrook Station License Renewal Application

References:

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

By Reference 1, NextEra Energy Seabrook, LLC submitted an application for a renewed Facility Operating License for Seabrook Station Unit No. 1. As a result of interactions during the recent NRC Aging Management Program Audit activities at Seabrook Station and review of significant industry operating experience, NextEra Energy Seabrook, LLC has identified changes to the Seabrook Station Unit No. 1 License Renewal Application (LRA) in regards to the Buried Piping and Tanks Inspection Program and the Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program. These changes are provided in Enclosure 1 and Enclosure 2 to this letter, respectively. The changes are explained, and where appropriate to facilitate understanding, portions of the LRA are repeated with the change highlighted by strikethroughs for deleted text and bolded italics for inserted text. In some instances the entire text of a section has been replaced. In these cases a note is included in the introduction indicating the replacement of the entire text of the section. Revised LRA Section 3 tables associated with the Buried Piping and Tanks Inspection Program will be submitted in a future supplement.

Commitment numbers 24 and 36 of the License Renewal Commitment List are modified as shown in the enclosures. 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 Seabrook correspondence to date.

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NRR

If there are any technical 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 Manger, at (603) 773-7745.

Sincerely,
NextEra Energy Seabrook, LLC

Paul O. Freeman
Site Vice President

Enclosures:

Enclosure 1- Changes to the Seabrook Station License Renewal Application associated with the Buried Piping and Tanks Inspection Program.

Enclosure 2- Changes to the Seabrook Station License Renewal Application associated with Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program.

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:

| | |
|---|---|
| | NRC Region I Administrator |
| G. E. Miller, | NRC Project Manager, Project Directorate I-2 |
| W. J. Raymond, | NRC Resident Inspector |
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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

29 day of October, 2010

Paul O. Freeman

Site Vice President

Shirley Sweeney

Notary Public

SHIRLEY SWEENEY
MY COMMISSION EXPIRES NOV. 18, 2014
NOTARY PUBLIC
NEW HAMPSHIRE

**Enclosure 1 to SBK-L-10179**

# Changes to the Seabrook Station License Renewal Application Associated with the Buried Piping and Tanks Inspection Program.

## Introduction

This Enclosure contains an update to the information provided in the NextEra Energy Seabrook License Renewal Application (LRA) related to the Buried Piping and Tanks Inspection aging management program. The LRA is being updated as a result of recent industry operating experience and additional information regarding the aging management of piping in buried and underground applications. Included in this update are changes to LRA Appendix A and Appendix B. For clarity, the text for LRA Appendix A and Appendix B have been revised in their entirety and are provided below. A revision to the License Renewal Commitment List, Appendix A, Table A.3 is included, with only the affected commitment shown in this Enclosure with the change highlighted by strikethroughs for deleted text and bolded italics for inserted text.

## Description of Changes

The Buried Piping and Tanks Inspection aging management program descriptions in LRA Appendix A, Section A.2.1.22; LRA Appendix A, Section A.3, License Renewal Commitment List Item No. 24; and LRA Appendix B, Section B.2.1.22 have been revised to reflect changes in the aging management program as a result of industry operating experience and additional information derived from that experience regarding appropriate preventive, mitigative, and inspection activities.

The Buried Piping and Tanks Inspection aging management program has been revised to provide specific discussion of preventive measures available and taken to minimize the effects of aging on buried and underground piping from corrosion, cracking, and changes in material properties. Verification of the effectiveness of cathodic protection, adequacy of backfill materials, and integrity of coatings and wrappings are methods described to minimize those effects. Such preventive measures are described as they apply to different materials of construction, including steel, stainless steel, and polymers.

Where no criteria had previously been available to determine the number and scope of inspections needed to detect any adverse effects of these aging mechanisms, the aging management program has been enhanced to provide such inspection criteria based on the piping material, the presence or absence of protective coatings and cathodic protection, and the adequacy of backfill materials. The inspection criteria has also been provided as it applies to piping containing HAZMAT materials (piping that, during normal operation, contains material that could be detrimental to the environment) including chemical substances such as diesel fuel and glycol. Additional criteria have been included to evaluate the effectiveness of cathodic protection systems and to evaluate the adequacy of backfill materials.

While direct visual inspection of pipe coatings and wrappings is utilized as a means to identify potential degradation of the exterior surfaces of metallic piping, other inspection methods including wall thickness measurement and volumetric examination for cracking are also discussed. Visual inspection and mechanical examination for evidence of cracking, blistering, or changes in mechanical properties are included to evaluate portions of the buried piping constructed of polymer materials. Alternative inspection techniques such as hydrostatic testing, internal inspections, and monitoring of other indicators of system and component performance are also provided where such non-intrusive techniques have been demonstrated to be effective in detecting these aging effects and the method avoids the potential hazards associated with excavation.

**Seabrook Station Unit 1 Appendix A**

## A.2.1.22 BURIED PIPING AND TANKS INSPECTION

The Buried Piping and Tanks Inspection Program manages loss of material from the external surfaces of buried, underground, and inaccessible submerged steel, stainless steel, and polymer piping and components. The plant has no buried tanks in scope for license renewal. Depending on the material, the program includes external coatings, cathodic protection, and quality of backfill as preventive measures to mitigate corrosion.

The program includes provisions for visual inspections of the protective wraps and coatings on buried steel and stainless steel piping. If damage to the protective wraps or coatings is found and the piping surface is exposed, the pipe is inspected for loss of material due to general, pitting, crevice or microbiologically-influenced corrosion. If corrosion has occurred, the wall thickness will be determined. Stainless steel piping will be inspected for stress corrosion cracking using volumetric non-destructive examination techniques. Polymer piping is inspected for changes in material properties and for indication of cracking and blistering.

The program includes verification of the effectiveness of the cathodic protection system, non-destructive evaluation of the pipe wall thicknesses, hydrostatic testing of the pipe, internal inspections, and monitoring of the fire protection system jockey pump operation.

This program also manages the aging effects of buried, underground, or inaccessible submerged piping system bolting.

## A.3 LICENSE RENEWAL COMMITMENT LIST

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 24 | Buried Piping ***And Tanks*** Inspection | Implement the Buried Piping And Tanks Inspection Program. | A.2.1.22 | Within ten years ~~of~~ **prior to** entering the period of extended operation. |

## Seabrook Station Unit 1 Appendix B

## B.2.1.22 BURIED PIPING AND TANKS INSPECTION

### Program Description

The Seabrook Station Buried Piping and Tanks Inspection Program is a new plant specific program. Although the program title refers to buried tanks as well as piping, Seabrook Station has no buried tanks in scope for license renewal.

The Seabrook Station program will include coating, cathodic protection and backfill quality as preventive measures to mitigate corrosion, and periodic inspections that manage the aging effects of corrosion on buried piping in the scope for license renewal.

At Seabrook Station, the initial installation of in-scope buried steel and stainless steel piping included external coatings and wrappings. Coatings and wrappings are repaired or replaced when damage is detected.

The Seabrook Station program will include provisions for visual inspections of the protective wraps and coatings on buried steel and stainless steel piping in-scope for license renewal. The visual inspections for damage will be performed when the piping is excavated during maintenance and when a pipe is dug up and inspected for any reason. The inspections will look for evidence of damaged wrapping or coating defects, such as coating perforation, holidays, or other damage. If damage or degradation of coating materials is found, and the piping surface is exposed, the affected area will be inspected visually to detect loss of material by external corrosion (including microbiologically-induced corrosion, MIC), and by surface or volumetric non-destructive examination techniques to detect cracking due to stress corrosion cracking in stainless steel piping or loss of pipe wall thickness in stainless steel or steel piping.

The Seabrook Station program will also include provisions for visual inspections of buried polymer piping in-scope for license renewal. These inspections for damage will be performed when the piping is excavated during maintenance and when a pipe is dug up and inspected for any other reason. These inspections will include mechanical examination for evidence of changes in material properties.

At least one opportunistic or directed (focused) inspection will be performed for each piping material within the scope of this program within 10 years prior to entering the period of extended operation. Upon entering the period of extended operation at least one directed inspection will be performed for each piping material within the scope of this program each ten years. Opportunistic inspections may be credited provided all location selection criteria are met.

Hydrostatic testing may be performed in lieu of external visual inspections discussed above provided that at least 25% of the piping constructed from the material under consideration is hydrostatically tested in accordance with 49 CFR 195 subpart E "*Transportation of Hazardous Liquids by Pipeline Pressure Testing*" on an interval not to exceed 5 years.

Internal inspection may also be performed in lieu of external visual inspections discussed above provided that at least 25% of the piping constructed from the material under consideration is internally inspected by a method capable of determining pipe wall thickness. The inspection method must be capable of detecting both general and pitting corrosion and must be qualified by Seabrook Station and accepted by the NRC. Internal inspections are to be conducted at an interval not to exceed 5 years.

Fire mains may also be excluded from the external visual inspections discussed above if subjected to a flow test as described in section 7.3 of NFPA 25 "*Standard for the Installation of Private Fire Service Mains and Their Appurtenances*", at an frequency of at least one test in each one year period, or if the jockey pump (or equivalent parameter) is monitored for unexplained changes in pump activity at an interval not to exceed one month.

Within this program, the following three different environments are referenced:

1. *Buried Piping*: This term means the piping is in direct contact with soil or concrete.
2. *Underground Piping*: This term means the piping is located below grade but contained within a vault such that it is in contact with air indoor uncontrolled and located where access for inspection is restricted.

3. *Inaccessible Submerged Piping*: This term means the piping is located below grade but contained within a vault such that it is in contact with ground water (raw water) and located where access for inspection is restricted.

   Portions of the Service Water system piping are routed through underground vaults or valve pits, which were installed to provide access to the buried Service Water piping for internal inspections. These vaults and pits were not designed to be watertight and subsequently the piping is typically submerged in ground water. This environment is different from "underground" since the normal external environment is ground water and not air. Therefore, for the purpose of this program, the affected Service Water piping segments are referred to as "inaccessible submerged" piping. This piping is coated and cathodically protected. With the exception of backfill and soil-resistivity criteria, this piping will be inspected to the same extent as buried piping.

This Buried Piping and Tanks Inspection Program also provides for management of the aging effects (loss of material) on buried, underground, and inaccessible submerged piping system bolting.

Program Elements

ELEMENT 1 - SCOPE OF PROGRAM

This program is used to manage the effects of aging for buried and underground piping within the scope of license renewal constructed of any material, including metallic and polymeric materials. The program addresses aging effects such as loss of material, cracking, and changes in material properties.

The Seabrook Station Buried Piping and Tanks Inspection Program includes (a) preventive measures to mitigate corrosion and (b) inspections to manage aging effects on in-scope buried piping. This program requires opportunistic or directed inspection of each piping material within the scope of this program be performed within ten years prior to entering the period of extended operation. Periodic inspections are performed every 10 years after entering the period of extended operation.

Loss of material due to corrosion of buried, underground, and inaccessible submerged piping system bolting within the scope of license renewal is managed using this program.

The program is required to support the aging management activities for buried steel, stainless steel, and polymer piping, and inaccessible submerged steel piping. The following systems are within the scope of license renewal and have buried components that are age managed by this program;

- AB Auxiliary Boiler
- ASC Auxiliary Steam Condensate
- ASH Auxiliary Steam Heating
- CBA Control Building Air Handling
- CO Condensate
- DF Plant Floor Drain
- DG Diesel Generator
- IA Instrument Air
- FW Feedwater
- FP Fire Protection
- SW Service Water

ELEMENT 2 - PREVENTIVE ACTIONS

Coating

In-scope buried steel and stainless steel pipes were wrapped and / or coated per original construction requirements to protect the outer surface from coming in contact with a soil environment. The in-scope buried steel and stainless steel have external coatings and wrappings in accordance with Seabrook Station specifications. This external coating was fabricated and applied in accordance with the requirements of American Water Works Association (AWWA) Specification C203. The specification calls for all coated surfaces to be tested. All coated surfaces were tested and any holidays, faults, or missed places indicated by the holiday detector were repaired utilizing the same system as the original coating per AWWA C203. The AWWA C203 specification meets the requirements of NACE SP0169-2007, "Standard Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems", Table 1.

The in-scope buried steel and stainless steel piping are maintained in accordance with Seabrook Station maintenance procedures.

In-scope polymer piping is not wrapped or coated.

Cathodic Protection

The Seabrook Station buried Service Water, Diesel Generator cooling water, and Instrument Air piping within the scope of license renewal is cathodically protected. Additionally, portions of other buried piping within the scope of license renewal in the Fire Protection and Control Building Air Handling systems are also cathodically protected.

Underground piping cathodic protection system data acquisition/surveillance is performed on a frequency of every six months to determine the effectiveness of the cathodic protection system. The cathodic protection system meets the NACE recommendations for pipe-to-soil potential as defined by NACE SP0169-2007, "Standard Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems."

Backfill Quality

Seabrook Station Specifications provide the requirements for backfill material sizing shown below. Also shown are material sizing specified by ASTM D-488 for sizes number 67 and 10 for comparison.

| Sieve Size | Percent Passing | | |
|---|---|---|---|
| | Seabrook Backfill Specification | ASTM D 448-08 | |
| | | Size 67 ¾" to #4 | Size 10 #4 to 0 |
| 1½" | 100 | -- | -- |
| 1" | -- | 100 | -- |
| ¾" | 100-95 | 100-90 | -- |
| ⅜" | -- | 55-20 | 100 |
| #4 | 95-50 | 10-0 | 100-85 |
| #8 | -- | 5-0 | -- |
| #10 | 86-30 | -- | -- |
| #20 | 70-15 | -- | -- |
| #40 | 50-7 | -- | -- |
| #60 | 32-3 | -- | -- |
| #100 | -- | -- | 30-10 |
| #200 (washed) | 10-0.2 | -- | -- |

Backfill quality will be evaluated during all excavations and determined to be acceptable if the inspections conducted by this program do not reveal evidence of mechanical damage to pipe or pipe coatings due to the backfill.

ELEMENT 3 - PARAMETERS MONITORED/INSPECTED

Steel and stainless steel piping will be inspected for degradation of coating materials. Should damage or other degradation of coating materials so as to expose the base material be noted, the condition will be documented, evaluated, and corrected in accordance with the Seabrook Station corrective action program. When such damage or degradation of coating materials is found, the affected area will be visually inspected to detect loss of material by external corrosion, and by surface or volumetric non-destructive examination techniques to detect cracking due to stress corrosion cracking in stainless steel piping or loss of pipe wall thickness in stainless steel and steel piping.

Polymer piping will be inspected, by manual examinations, for changes in material properties, and by visual inspection for signs of cracking, blistering or damage. Any changes in material properties, or signs of cracking, blistering or damage, will be documented, evaluated, and, corrected in accordance with the Seabrook Station corrective action program.

Two additional parameters, the pipe-to-soil potential and the cathodic protection current, will be monitored to determine the effectiveness of cathodic protection systems and, thereby, the effectiveness of corrosion mitigation.

This program provides alternate means to test the integrity of the buried piping systems at Seabrook Station in lieu of external visual inspections. These alternate means are hydrostatic testing, internal inspection, and flow testing of fire mains. These inspection and testing techniques that do not create a challenge to the integrity of the pipe wrapping and coating, where such techniques have been demonstrated to provide reliable indication of the piping integrity, are preferable to excavation and visual inspection.

To credit hydrostatic testing in lieu of visual inspection, at least 25% of the piping constructed from the material under consideration must be hydrostatically tested in accordance with 49 CFR 195 subpart E on an interval not to exceed 5 years. Such testing will identify boundary leakage in significantly larger portions of the respective piping system than excavation and visual inspection of coating integrity.

To credit internal inspection, at least 25% of the piping constructed from the material under consideration is internally inspected by a method capable of determining pipe wall thickness. The inspection method must be capable of detecting both general and pitting corrosion and must be qualified by Seabrook Station and accepted by the NRC. Internal inspections are to be conducted at an interval not to exceed 5 years.

Fire mains may be excluded from the visual inspections if subjected to a flow test as described in section 7.3 of NFPA 25, at a frequency of at least one test in each one year period, or the jockey pump operation (or equivalent parameter) is monitored for unexplained changes in pump activity at an interval not to exceed once a month.

At Seabrook Station, the fire protection jockey pump maintains the fire mains pressurized. Starts and running time of the fire protection jockey pumps are monitored and treated as an indicator of possible system leakage. This method of continuous monitoring of pressure losses in the fire mains will identify pipe boundary leakage in significantly larger portions of the fire protection piping system than excavation and visual inspection of coating integrity. At a minimum, a flow test will be conducted by the end of the next refueling outage or as directed by current licensing basis, whichever is shorter, when unexplained changes in jockey pump activity (or equivalent parameter) are observed.

This program also provides for management of the aging effects (loss of material) on buried, underground, and inaccessible submerged piping system bolting.

ELEMENT 4 - DETECTION OF AGING EFFECTS

The Seabrook Station Buried Piping and Tanks Program consists of inspection activities that are designed to detect degradation due to aging effects prior to loss of intended function. For buried steel and stainless steel piping, opportunistic or directed (focused) visual inspections will be performed to confirm that coating and wrapping are intact. In the event that the coating has been compromised and bare metal exposed, metallic piping is inspected for loss of material due to all forms of corrosion and, for stainless steel, cracking due to stress corrosion cracking. Wall thickness is determined by a non-destructive examination technique such as ultrasonic testing (UT). For buried polymer piping, opportunistic or directed visual inspections are augmented with manual examinations to detect hardening, softening, or other changes in material properties.

Pipe-to-soil potential and the cathodic protection current are monitored for steel, piping in contact with soil to determine the effectiveness of cathodic protection systems and, thereby, the effectiveness of corrosion mitigation.

The program requires that opportunistic or directed inspections will be performed within 10 years prior to entering the period of extended operation. Upon entering the period of extended operation, directed inspections will be performed during each subsequent ten year period. Opportunistic and/or directed visual inspections will be performed in areas with the highest likelihood of corrosion problems, or areas with a history of corrosion

problems. Opportunistic inspections may be credited provided all location selection criteria are met.

The number of inspections required during each 10 year interval is shown in the tables below. The number of inspections will be determined by the status of cathodic protection, coating, and adequacy of backfill materials. Piping containing diesel fuel (Auxiliary Boiler fuel oil) or glycol (Diesel Generator cooling water) is treated as HAZMAT lines. The HAZMAT lines may require additional inspection criteria as shown in the table.

Inspections as indicated in (A), (B), or (C) below may be performed in lieu of the inspections described in the tables below.

(A) Hydrostatic testing may be performed in lieu of the inspections described below. To credit hydrostatic testing, at least 25% of the piping constructed from the material under consideration must be hydrostatically tested in accordance with 49 CFR 195 subpart E "Transportation of Hazardous Liquids by Pipeline, Pressure Testing" on an interval not to exceed 5 years.

(B) Internal inspection may be performed in lieu of the inspections described below. To credit internal inspection, at least 25% of the piping constructed from the material under consideration is internally inspected by a method capable of determining pipe wall thickness. The inspection method must be capable of detecting both general and pitting corrosion and must be qualified by Seabrook Station and accepted by the NRC. Internal inspections are to be conducted at an interval not to exceed 5 years.

(C) Fire mains may be excluded from the inspection requirements below if they are subjected to either of the following two testing methods. The first is a flow test as described in section 7.3 of NFPA 25, at a frequency of at least one test in each one year period. The second is monitoring of the jockey pump operation for unexplained changes in activity at an interval not to exceed once per month. When unexplained changes in jockey pump activity are observed, a flow test is conducted by the end of the next refueling outage or as directed by current licensing basis, whichever is shorter, to determine if the piping system integrity has degraded unacceptably.

At Seabrook Station, the fire mains are maintained pressurized. Starts and running time of the fire protection jockey pumps are monitored and treated as an indicator of possible system leakage. This method of continuous monitoring pressure losses in the fire mains may be used in lieu of the NFPA 25 "Standard for the Installation of Private Fire Service Mains and Their Appurtenances" flow test to exclude the fire mains from the inspections described in the table below.

## Buried Piping Inspection Locations

| Material Type | System | HAZMAT | Cathodically Protected | Applied Coatings | Inspections per 10-Year Period[1,2,3] | |
|---|---|---|---|---|---|---|
| | | | | | Adequate Backfill[4] | Inadequate Backfill[4] |
| Steel | CBA, IA, FP, SW | No | Yes | Yes | 1 | 4 |
| | AB[5] | Yes | No | Yes | 5% | 10% |
| | CBA, CO, DG, FW, DF, FP | No | No | Yes | 4 | 8 |
| Polymer | FP | No | No | No | 1 | 2 |
| Stainless Steel | DG | Yes | Yes | Yes | 1 | 1 |
| | CO | No | No | Yes | | |

GENERAL NOTES:

1. Each inspection will examine either the entire length of a run of pipe or a minimum of 10 feet.
2. If the length of pipe to be inspected based on the number of inspections times the minimum inspection length (10 feet) exceeds 10% of the length of the piping under consideration, only 10% need be inspected.
3. If the length of pipe to be inspected based on the total length of pipe under consideration times percentage to be inspected is less than 10 feet, either 10 feet or the total length of pipe present, whichever is less, will be inspected.
4. The effectiveness of backfill materials and processes will be determined by the condition of coatings and base materials noted during inspections. If damage to the coatings or base materials are determined to have been caused by the backfill, the backfill will be considered to be "inadequate" (for the purpose of this program) for that material type only.
5. This line is not is use and has been drained and flushed and is awaiting replacement per a design change. The inspection criteria for the replacement piping will be determined based material selection, coating, cathodic protection, and quality of backfill.

## Underground Piping Inspection Locations

| Material Type | System | HAZMAT | Inspections per 10-Year Period [1,3] |
|---|---|---|---|
| Steel | ASC[2], ASH[2] | No | 2 |

GENERAL NOTES:

1. Each inspection will examine either the entire length of a run of pipe or a minimum of 10 feet.
2. ASC and ASH systems are non-safety related.
3. Cathodic protection and applied coatings do not factor into the inspection criteria for underground piping as these locations are exposed to an air indoor uncontrolled environment

**Inaccessible Submerged Piping Inspection Locations**

| Material Type | System | HAZMAT | Cathodically Protected | Applied Coatings | Inspections per 10-Year Period[1] |
|---|---|---|---|---|---|
| Steel | SW[2] | No | Yes | Yes | 2 |

GENERAL NOTES:

1. Each inspection will examine either the entire length of a run of pipe or a minimum of 10 feet.
2. The Service Water vault located north of the cooling tower contains four 24" lines approximately 15' long. The valve pit located north of the cooling tower contains one 32" line less than 10' long.

ELEMENT 5 - MONITORING AND TRENDING

The results of previous inspections will be evaluated, and used to assess the condition of the external surfaces of other buried steel, stainless steel and polymer components, and to identify susceptible locations that may warrant further inspections.

For piping protected by cathodic protection, pipe-to-soil potential and cathodic protection current measurements will be monitored at least once a year and trended to identify changes in the effectiveness of the cathodic protection system.

If aging of fire mains is managed through monitoring jockey pump activity (or similar parameter), jockey pump activity (or similar parameter) will be trended at least once a month to identify changes in pump activity that may be the result of increased leakage from buried fire main piping.

ELEMENT 6 - ACCEPTANCE CRITERIA

For coated piping, there should be either no evidence of coating degradation or the type and extent of coating degradation should be insignificant as evaluated by an individual possessing a NACE operator qualification or by an individual otherwise meeting the qualifications to evaluate coatings as contained in 49 CFR 192 and 195. Any coating and wrapping degradation will be documented and evaluated under the corrective action program.

If metallic piping shows evidence of corrosion, the remaining wall thickness in the affected area is evaluated to ensure that the minimum wall thickness is maintained.

Cracking or blistering of polymer piping is evaluated under the corrective action program.

Criteria for pipe-to-soil potential and cathodic protection current as listed in SP0169-2007 are met or evaluated under the corrective action program.

Backfill is consistent with SP0169-2007 section 5.2.3. Backfill located within 6 inches of steel and stainless steel pipe that meets ASTM D 448-08 size number 67 meets the objectives of SP0169-2007. Backfill located within 6 inches of polymeric pipe that meets ASTM D 448-08 size number 10 meets the objectives of SP0169-2007. Backfill quality may be demonstrated by plant records or by examining the backfill while conducting the inspections conducted in accordance with this program. Backfill not meeting this standard, in either the initial or subsequent inspections, is acceptable if the inspections conducted in accordance with this program do not reveal evidence of mechanical damage to pipe coatings due to the backfill.

Flow test results for fire mains, if credited in lieu of visual inspections, are in accordance with NFPA 25 section 7.3.

Unexplained changes in jockey pump activity (or similar parameter), if credited in lieu of visual inspections, are evaluated under the corrective action program.

For hydrostatic tests, if credited in lieu of visual inspections, the condition "without leakage" as required by 49 CFR 195.302 may be met by demonstrating that the test pressure, as adjusted for temperature, does not vary during the test.

ELEMENT 7 - CORRECTIVE ACTIONS

All indications will be evaluated per the acceptance criteria. Unacceptable indications will be corrected through implementation of appropriate repair or replacement activities.

Indications noted will be entered into the Seabrook Station Corrective Action Program for appropriate disposition. A repair, replacement, or evaluation will be performed.

The FPL/NextEra Energy Quality Assurance Program and Nuclear Fleet procedures will be utilized to meet Element 7 Corrective Actions.

ELEMENT 8 - CONFIRMATION PROCESS

The FPL/NextEra Energy Quality Assurance Program and Nuclear Fleet procedures will be utilized to meet Element 8 Confirmation Process.

ELEMENT 9 - ADMINISTRATIVE CONTROLS

The FPL/NextEra Energy Quality Assurance Program and Nuclear Fleet procedures will be utilized to meet Element 9 Administrative Controls.

ELEMENT 10 - OPERATING EXPERIENCE

The primary source of OE, both industry and plant specific, was the Seabrook Station Corrective Actions Program documentation. The Seabrook Station Corrective Action Program is used to document review of relevant external OE including INPO documents, NRC communications and Westinghouse documents, and plant specific OE including corrective actions, maintenance work orders generated in response to a structure, system or component failure, system and program health reports, self-assessment reports and NRC and INPO inspection reports.

The Seabrook Station Corrective Action Program is used to track, trend and evaluate plant issues and events. Those issues and events, whether external or plant specific, that are potentially significant to the Buried Piping and Tanks Program Inspection Program are evaluated. The Buried Piping and Tanks Program Inspection Program is augmented, as appropriate, if these evaluations show that program changes will enhance program effectiveness.

A review of industry related operating experience related to the Buried Piping and Tanks Program was performed. The review includes NRC generic communications issued, in the form of Generic Letters, Bulletins, and Information Notices.

Recent industry operating experience is discussed below:

1. OE 28335 and OE 29126 – Indian Point 2 - 2/15/2009

   Buried Condensate return pipe was found to be leaking, which was discovered by a Nuclear Plant Operator who observed water filling the floor guard collar on the Condensate return line and spilling onto the floor in the Auxiliary Feedwater Building. The leak rate was determined to be approximately 5 cc/min from the sleeve with an estimated 15 to 20 gpm underground. The through-wall area was approximately 1" X ¼" and appeared to have resulted from failure of the coal-tar saturated asbestos outer-wrapper. The return line was an unlined carbon-steel pipe and was original equipment from construction.

2. OE 29020 – Oyster Creek – 4/15/2009

   Elevated Tritium concentrations were identified at Oyster Creek during preparation for work inside the emergency service water vault. The root cause of these leaks was determined to be the corrosion mechanism known as anodic dissolution resulting from poor application of coating that left the buried pipes susceptible to corrosion.

3. OE 29214 – Dresden – 6/9/2009

   During routine environmental sampling of storm drains and sample wells, elevated levels of tritium were identified in the storm drain system. During the investigation, it was identified that the source of the tritium was a

leaking standpipe within the Condensate Storage Tank and a pinhole leak in a 4-inch clean demineralized water pipe utilized to fill the Condensate Storage Tank. A root cause investigation determined the through-wall leaks to be the result of external corrosion due to degraded protective moisture barrier wrap.

The Seabrook Station plant specific operating experience identified the following:

1. Seabrook Station has no history of failures of buried piping leading to loss of function of a component within the scope of license renewal.
2. Extensive visual inspection of buried Service Water system piping interior surfaces has been conducted since Refueling Outage 4 (Fall of 1995) with no indications of pipe wall degradation. The piping is cement lined, but degradation from the exterior surface is expected to lead to staining of the cement liner as water and corrosion products reach the inner surface of the pipe wall. When staining of the cement liner is found, the liner material is removed in order to evaluate the surface condition of the underlying pipe. Ultrasonic thickness measurements are taken to determine any degradation of the pipe wall. Such information, combined with no indication of interior pipe surface degradation, would indicate wall thinning caused by external environmental conditions. To date, there has been no indication of through wall leakage in the buried Service Water piping either originating from the inside surface or the outside surface. This example demonstrates one alternate indirect inspection method used to identify exterior surface degradation.
3. In November 2000, the Auxiliary Boiler buried fuel supply line was determined to be leaking diesel fuel into the surrounding soil. A small leak was discovered in the buried carbon steel pipe in an area where the bituminous wrap had been damaged. The fuel-contaminated soil was removed and with the concurrence of the New Hampshire Department of Environmental Services, the leak was temporarily repaired. In June 2001, after an examination of the failed section of pipe and visual/ultrasonic inspections at several excavations along the piping run, further pipe deterioration was discovered and it was ultimately decided that the existing pipe would not be returned to service. A design change was initiated to replace the piping with dual-wall pipe meeting newly passed state requirements. A temporary modification was created to provide fuel oil during the period of implementation of this design change.
4. In March of 2001, a service vendor noticed oil drops coming from the ground around the fuel oil pumps at the vehicle maintenance shop. After excavation, the source of the leak was found to be at a threaded joint. An evaluation of the condition determined that the most likely cause of the pipeline leakage was the loosening of the joints over time due to

temperature changes and frost heaving. The pumping station and underground piping were removed and a new pumping station and dual-wall underground piping with leak detection capability were installed. This piping is not in the scope of license renewal, but the example demonstrates appropriate investigation of and response to identified degradation of buried piping.

5. A branch connection was installed in a 6 inch buried Fire Protection system line by a Seabrook Station work order in 2007. When excavated, the existing carbon steel pipe was inspected and showed no degradation of the coating or external surfaces.

6. Following excavation to repair a Fire Protection valve in September 2008, minor damage to the external tape coat on a 12" carbon steel Fire Protection line was found. Engineering was notified and the condition documented in the Seabrook Station Corrective Action Program. An inspection report was issued providing pictures of the piping and included documentation that the coating was worn but no metal (pipe) was exposed, and that there were no signs of backfill embedded in the coating. The coating was repaired and the area backfilled. This example demonstrates the appropriate notifications and inspections utilized when opportunistic observations detect evidence of conditions that could affect the integrity of buried piping.

7. Following an EPRI workshop on buried piping, the Seabrook Station attendees presented a case for development of a buried pipe program. A plan was developed and appropriate actions assigned in the Seabrook Station Corrective Action Program to implement this program. Specific actions were assigned in the Corrective Action Program in November 2007. Underground piping was identified and inventoried by the respective system engineers, and a Buried Piping System Health Report generated. This health report is issued periodically by the assigned System Engineer. Seabrook Station procedures are being developed and will form the bases for this program.

8. In December of 2007, an engineering change was implemented which replaced depleting underground sacrificial anodes and retuned rectifier tap settings to provide proper protection for the underground piping. The new potential criterion as defined by NACE SP0169-2007, "Standard Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems" for underground steel piping was also implemented. Subsequent surveillances of the underground cathodic protection system showed no degraded conditions and indicated that the cathodic protection system is within the NACE recommendations for pipe-to-soil potentials.

These examples of Seabrook Station operating experience provide evidence that the Buried Piping and Tanks Inspection Program will adequately monitor the aging effects and that Seabrook Station is maintaining an awareness and sensitivity to operating experiences throughout the industry that could impact this program.

**Exceptions to NUREG-1800**

None

**Enhancements**

None

**Conclusion**

The Seabrook Station Aging Management Program for Buried Piping and Tanks Inspection provides reasonable assurance that the aging effects will be adequately managed such that applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

# Enclosure 2 to SBK-L-10179

**Changes to the**
**Seabrook Station License Renewal Application**
**Associated with**
**Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49**
**Environmental Qualification Requirements Program**

## Introduction

This Enclosure contains an update to the information provided in the NextEra Energy Seabrook License Renewal Application (LRA) related to the Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Program aging management program. The LRA is being updated as a result of Seabrook Station reviews of recent operating experience. Included in this update are changes to LRA Section 3.6, Tables 3.6.1, Table 3.6.2-1, Appendix A and Appendix B. For clarity, entire sentences or paragraphs from the LRA are provided with deleted text highlighted by strikethroughs and inserted text highlighted by bolded italics. A revision to the License Renewal Commitment List, Appendix A, Table A.3 is included with only the affected commitment shown in this Enclosure.

## Description of Changes

The Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Program aging management program descriptions in LRA Section 3.6, Tables 3.6.1, Table 3.6.2-1, Appendix A, Section A.2.1.34; and LRA Appendix B, Section B.2.1.34 are revised to increase the scope of the program to include in-scope inaccessible ≥ 400 volt power cables (energized or de-energized) that have the potential of being exposed to significant moisture. In addition, inspection frequency for water collection in manholes has been modified. The periodic inspection occurs at least annually. To more accurately reflect the above changes, the program has been renamed as the Inaccessible Power Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Program

Specifically, recent operating experience from other plants has implied that cables in the ≥ 400 volt range may be susceptible to failure if exposed to significant moisture. Additionally, recent operating experience from other plants has also shown that some failures have occurred in normally de-energized cables.

Aging management activities will include periodic inspections for water collection in manholes that contain in-scope ≥ 400 volt power cables. The inspection is established and performed based on plant specific operating experience with cable wetting or submergence in manholes (i.e., the inspection is performed periodically based on water accumulation over time and event driven occurrences, such as heavy rain or flooding). The periodic inspection will occur at least annually. Additionally, testing of all in-scope ≥ 400 volt power cables will occur at least once every six years. The first inspections and tests for license renewal will be completed prior to the period of extended operation.

**Seabrook Station Unit 1 Section 3.6**

## 3.6.2.1.1 Non-EQ Electrical Cables and Connections

**Materials**

The materials of construction for the Non-Environmentally Qualified (Non-EQ) electrical cables and connections are:

- Various Organic Polymers

**Environments**

The Non-EQ electrical cables and connections are exposed to the following environments:

- Adverse localized environment caused by heat, radiation, or moisture in the presence of oxygen
- Adverse localized environment caused by exposure to moisture and voltage

**Aging Effects Requiring Management**

The following aging effects associated with Non-EQ electrical cable and connections require management:

- Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure
- Localized damage and breakdown of insulation leading to electrical failure

**Aging Management Programs**

The following aging management programs manage the aging effects for the Non-EQ electrical cables and connections:

- Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.2.1.32)
- Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (B.2.1.33)
- Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.2.1.34)

**Table 3.6.1**
**Summary of Aging Management Evaluations for the Electrical / I&C Components / Commodities**

| Item Number | Component | Aging Effect/Mechanism | Aging Management Programs | Further Evaluation Recommended | Discussion |
|---|---|---|---|---|---|
| 3.6.1-4 | Conductor insulation for inaccessible medium voltage (2 kV to 35 kV) cables (e.g., installed in conduit or direct buried) not subject to 10 CFR 50.49 EQ requirements | Localized damage and breakdown of insulation leading to electrical failure due to moisture intrusion, water trees | Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 EQ Requirements | No | Consistent with NUREG-1801 ***with enhancements.*** The Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Program, B.2.1.34, will be used to manage localized damage and breakdown of insulation leading to electrical failure, due to moisture intrusion and water trees, in adverse localized environments, for ~~medium voltage~~ ***≥ 400 Volt power*** cables. |

**Table 3.6.2-1**
**Summary Of Aging Management Evaluations for the Electrical / I&C Components / Commodities**

| Component Type | Intended Function | Material | Environment | Aging Effect Requiring Management | Aging Management Program | NUREG-1801 Vol. 2 Item | Table 3.X.1 Item | Note |
|---|---|---|---|---|---|---|---|---|
| Non-EQ inaccessible medium-voltage cables | Electrical Continuity | Various organic polymers (e.g., EPR, SR, EPDM, XLPE) | Adverse localized environment caused by exposure to moisture and voltage | Localized damage and breakdown of insulation leading to electrical failure | Inaccessible ~~Medium Voltage~~ **Power** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements | VI.A-4 (L-03) | 3.6.1-4 | A |

**Seabrook Station Unit 1 Appendix A**

## A.2.1.34 INACCESSIBLE ~~MEDIUM VOLTAGE~~ *POWER* CABLES NOT SUBJECT TO 10 CFR 50.49 EQ REQUIREMENTS

The Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program manages the aging of inaccessible ~~Medium Voltage~~ ≥ ***400 volt power*** cables exposed to adverse localized environments caused by significant moisture ~~while energized~~. ***Seabrook Station defines significant moisture as periodic exposures to moisture that last more than a few days (e.g., cable in standing water). Seabrook Station considers periodic exposures to moisture that last less than a few days (i.e., normal rain and drain) as not being significant.***

The program includes the following two components:

- Periodic Inspections Of Manholes Containing In-Scope ~~Medium Voltage~~ ***Power*** Cables

  In-scope manholes shall be periodically inspected for water collection. Water found in the manholes shall be drained.

  The frequency of manhole inspections shall be adjusted based on inspection results. However, the maximum time between inspections shall be no more than ~~two years~~ ***one year***. The first inspections shall be performed prior to entering the period of extended operation.

- Testing Of In-Scope Inaccessible ~~Medium Voltage~~ ***Power*** Cables

  The specific type of test performed shall be determined prior to the initial test, and shall be a proven test for detecting deterioration of the insulation system due to wetting, such as power factor, partial discharge, or polarization index, as described in EPRI guidelines for "*Effects of Moisture on the Life of Power Plant Cables*" or other testing that is state-of-the-art at the time the test is performed. Cable testing shall be performed prior to entering the period of extended operation and at least once every ~~10~~ ***6*** years thereafter.

## A.3 LICENSE RENEWAL COMMITMENT LIST

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 36 | Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements | Implement the Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program. | A.2.1.34 | Prior to the period of extended operation. |

**Seabrook Station Unit 1 Appendix B**

## B.2.1.34 INACCESSIBLE ~~MEDIUM VOLTAGE~~ *Power* CABLES NOT SUBJECT TO 10 CFR 50.49 EQ REQUIREMENTS

### Program Description

The Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new program that will manage the aging effects of localized damage and breakdown of insulation leading to electrical failure of inaccessible ~~medium voltage~~ ***≥ 400 volt power*** cables due to adverse localized environments caused by exposure to significant moisture ~~and voltage~~ ***regardless of frequency of energization***.

Seabrook Station defines an adverse localized environment for ~~medium voltage~~ ***≥ 400 volt*** **power** cables as exposure to moisture for more than a few days ~~while energized at the system voltage for more than 25 percent of the time~~.

The Seabrook Station program includes periodic inspections of manholes containing in-scope ~~medium voltage~~ ***≥ 400 volt power*** cables. The inspection focuses on water collection in cable manholes, and draining water, as needed. The frequency of manhole inspections for accumulated water and subsequent pumping will be based on ~~inspection results~~ ***plant specific operating experience with cable wetting or submergence (i.e, the inspection is performed periodically based on water accumulation over time and event driven occurrences, such as heavy rain or flooding).*** The objective of the inspections is to keep the cables from becoming submerged thereby minimizing their exposure to significant moisture. To meet this objective, adjustments in inspection frequency may be required. The maximum time between inspections will be no more than ~~two years~~ ***one year***. The first inspections will be completed prior to entering the period of extended operation.

In addition to periodic manhole inspections, in-scope, ~~medium voltage~~ ***≥ 400 volt power*** cables exposed to significant moisture ~~and energized at the system voltage for more that 25 percent of the time~~ are tested to provide an indication of the condition of the conductor insulation. The specific type of test performed will be determined prior to the initial test, and is a proven test for detecting deterioration of the insulation system due to wetting, such as power factor, partial discharge, or polarization index, as described in EPRI TR-103834-P1-2, "*Effects of Moisture on the Life of Power Plant Cables*" or other testing that is state-of-the-art at the time the test is performed. Cable testing will be performed prior to entering the period of extended operation and at least every ~~10~~ ***6*** years thereafter.

Development of this program considers the technical information and guidance provided in the following:

a. NUREG/CR-5643, *"Insights Gained From Aging Research"*

b. IEEE Std. ~~P~~1205, *"IEEE Guide for Assessing, Monitoring and Mitigating Aging Effects on Class 1E Equipment Used in Nuclear Power Generating Stations"*

c. SAND96-0344, *"Aging Management Guidelines for Commercial Nuclear Power Plants – Electrical Cable and Terminations"*

d. EPRI TR-109619, *"Guideline for the Management of Adverse Localized Equipment Environments"*

Seabrook Station defines significant moisture as periodic exposures to moisture that last more than a few days (e.g., cable in standing water). Seabrook Station considers periodic exposures to moisture that last less than a few days (i.e., normal rain and drain) as not being significant. ~~Significant voltage exposure is defined as being subjected to system voltage for more than twenty five percent of the time.~~

The Seabrook Station program includes periodic actions taken to prevent cables from being exposed to significant moisture, such as inspecting for water collection (and draining if needed) in manholes that contain in-scope inaccessible ~~medium voltage~~ ***≥ 400 volt power*** cables.

The Seabrook Station program acceptance criteria for the electrical cable test is defined by the specific type of test performed and the specific cable tested. If water is found in manholes, the water will be drained and the inspection frequency will be increased.

Unacceptable tests or inspections will be entered into the Corrective Action Program. The corrective action will include an engineering evaluation when the cable testing test acceptance criteria are not met to determine the acceptability of the cable to perform its intended function consistent with the current licensing basis. The evaluation will also consider the significance of the test results, the operability of the component, the reportability of the event, the extent of the concern, the potential root causes for not meeting the test acceptance criteria, the corrective actions required, and the likelihood of recurrence. The corrective action process will include a determination as to whether the same condition or situation is applicable to other inaccessible, in-scope, ~~medium voltage~~ ***≥ 400 volt power*** cables.

**NUREG-1801 Consistency**

This program is consistent with NUREG-1801 XI.E3.

**Exceptions to NUREG-1801**

None

**Enhancements**

~~None~~ ***The scope of the program is expanded to include all inaccessible ≥ 400 volt power cable within the scope of license renewal which are potentially exposed to significant moisture. The Seabrook Station program will include testing of all in-scope inaccessible ≥ 400 volt power cables which are potentially exposed to significant moisture. The Seabrook Station program will include inspections of manholes which contain in-scope ≥ 400 volt power cables.***

***Seabrook Station has expanded the scope of the program to include normally de-energized cables that are potentially subjected to significant moisture.***

***Justification for the Enhancement***

***Recent operating experience has implied that cables in the ≥ 400 volt range may be susceptible to failure if exposed to significant moisture.***

***Recent operating experience from other plants has also shown that some failures have occurred in normally de-energized cables.***

***To account for this operating experience Seabrook Station has expanded the scope to include all inaccessible (either energized or de-energized) ≥ 400 volt power cables.***

**Operating Experience**

Plant-specific and industry wide operating experience was considered in the development of this program. The review of plant-specific and industry-wide operating experience ensures that the corresponding NUREG-1801, Chapter XI.E3 Program will be an effective Aging Management Program for the period of extended operation.

1. The Seabrook Station program considered NUREG-1801 as part of the operating experience review. NUREG-1801 compiled the industry operating experience for inaccessible medium voltage cables. This information is current through the September 2005 issue date of the NUREG. This demonstrates that Seabrook Station considered industry operating experience in the formation of this aging management program.

2. Seabrook Station reviewed NRC Generic Letter 2007-01, "*Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients*". The Generic Letter informed licensees of failure of certain power cables can affect the functionality of multiple accident mitigation systems or cause plant transients. As part of the Generic Letter, the NRC provided examples of medium voltage cable failures at other utilities. In response to Generic Letter 2007-01, Seabrook Station described periodic testing of representative low voltage cables, testing of medium voltage cables and periodic inspections of manholes. The response concluded that no failures have occurred in power cables in the scope of Maintenance Rule. This operating experience demonstrates Seabrook's involvement in regulatory activities relative to inaccessible cables.

3. Seabrook Station performed reviews of plant specific operating experience. The review focused on test data of in-scope cables and manhole inspections.

   In 1994, a commitment was made to inspect 10 percent of the safety related manholes every five years. This commitment is reiterated in the Seabrook Station response to Generic Letter 2007-01.

   In 2009, a fleet procedure was issued which provided a dewatering strategy for electrical cables. The strategy is that all ~~medium voltage~~ cables important to generation and nuclear safety are to be maintained in a dry (not submerged) condition. The fleet procedure states that the inspection frequency should be based on operating experience that has demonstrated successful methods for keeping the cable dry. Seabrook Station has issued guidelines to implement the fleet procedure and has begun the process of complying with the fleet procedure.

   Seabrook Station performed inspections in late 2009 and early 2010 of all safety related manholes ~~containing medium voltage cables~~. Water was removed from the manholes. The inspection frequency was increased as required to prevent the ~~medium voltage~~ ***safety related*** cables from becoming submerged.

   ~~Results of tests performed in 2008 were reviewed~~. ***Seabrook Station has performed tests on all safety related inaccessible, in-scope ≥ 400 volt power cables and the non-safety related medium voltage cables***. All ***tested*** in-scope cables met the acceptance criteria of the test performed.

   This operating experience demonstrates that Seabrook Station is proactively managing the water levels in manholes containing safety related ~~medium voltages~~ ***≥ 400 volt*** cables and testing ***in-scope*** medium voltage cables.

   ***Seabrook Station has reviewed the industry operating experience provided to the NRC by other utilities in response to GL 2007-01 and concluded that an expansion of this program to include power cables of 400 volts and above is warranted.***

***As part of the GL 2007-01 response review, Seabrook Station has also determined that cable failures have occurred at other utilities in cables that are not normally energized while exposed to significant moisture. In response, Seabrook has decided* to include normally de-energized cables within the scope of this program.**

The above operating experience demonstrates that Seabrook Station considered industry operating experience while preparing this program, and participated in regulatory activities related to inaccessible ~~medium voltage~~ cables. The operating experience also demonstrates that Seabrook Station is proactive in managing the aging of ***in-scope*** inaccessible ~~medium voltages~~ **≥ 400 volt** safety related cables ***and medium voltage non-safety related cable.***

**Conclusion**

The Seabrook Station Inaccessible ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program provides reasonable assurance that the aging effects will be adequately managed such that applicable components will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

# Enclosure 3 to SBK-L-10179

## 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 |

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 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. |
| 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 | Within ten years of entering the period of extended operation. |
| 11. | Fire Water System | Enhance the program to include the performance of periodic visual inspection of the internal surface of the fire protection system upon each entry to the system for routine or corrective maintenance. This inspection will be performed no earlier than 10 years before the period of extended operation. | A.2.1.16 | Prior to the period of extended operation. |

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 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. |
| 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 of entering 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. |

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 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 of entering the period of extended operation. |
| 23. | Selective Leaching of Materials | Implement the Selective Leaching of Materials Program. | A.2.1.21 | Within five years of entering 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 ~~of~~ ***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 of entering 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 ~~Medium Voltage~~ ***Power*** Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements | Implement the Inaccessible ~~Medium Voltage~~ ***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. |

| No. | PROGRAM or TOPIC | COMMITMENT | UFSAR LOCATION | SCHEDULE |
|---|---|---|---|---|
| 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 $SF_6$ 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) | (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). | 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 |
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| | | (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. |