UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

August 14, 2017

Mr. Mano Nazar
President and Chief Nuclear Officer
Nuclear Division
NextEra Energy Seabrook, LLC
Mail Stop: EX/JB
700 Universe Blvd.
Juno Beach, FL 33408

SUBJECT: SEABROOK STATION, UNIT NO. 1 – INTEGRATED INSPECTION REPORT 05000443/2017002

Dear Mr. Nazar:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Seabrook Station, Unit No. 1 (Seabrook). On July 27, the NRC inspectors discussed the results of this inspection with Mr. Eric McCartney and other members of his staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Fred Bower, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Docket No. 50-443
License No. NPF-86

Enclosure:
Inspection Report 05000443/2017002
w/Attachment: Supplementary Information

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SUBJECT: SEABROOK STATION, UNIT NO. 1 – INTEGRATED INSPECTION REPORT 05000443/2017002 DATED AUGUST 14, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-443
License No:	NPF-86
Report No.:	05000443/2017002
Licensee:	NextEra Energy Seabrook, LLC (NextEra)
Facility:	Seabrook Station, Unit No. 1 (Seabrook)
Location:	Seabrook, NH 03874
Dates:	April 1, 2017 through June 30, 2017
Inspectors:	P. Cataldo, Senior Resident Inspector P. Meier, Resident Inspector W. Cook, Senior Reactor Analyst J. DeBoer, Emergency Preparedness Inspector B. Dionne, Certified Health Physicist E.H. Gray, Senior Reactor Inspector T. O'Hara, ISI Inspector M. Henrion, Project Engineer
Approved By:	Fred Bower, Chief Reactor Projects Branch 3 Division of Reactor Projects

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SUMMARY

IR 05000443/2017002; 04/01/2017 to 06/30/2017; Seabrook Station, Unit No. 1; Routine Integrated Inspection Report.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

No findings were identified.

REPORT DETAILS

Summary of Plant Status

Seabrook began the assessment period in Mode 1 at approximately 10 percent rate thermal reactor power (RTP) with the turbine generator disconnected from the grid for a planned shutdown in preparation for Refueling Outage No. 18 (OR18). Seabrook remained shutdown during performance of OR18 until reactor criticality was achieved on April 29, 2017. On April 29, at 1844, while at approximately 10 percent RTP and prior to synchronizing to the grid, the reactor was manually tripped in response to steam generator (SG) level perturbations. Reactor criticality was again achieved on April 30, 2017. Seabrook synchronized to the grid on May 1, 2017, and achieved full power (100 percent) on May 5, 2017. Seabrook operated essentially at full power for the remainder of the assessment. Documents reviewed for each section of this inspection report are listed in the Attachment.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors reviewed NextEra's readiness for the onset of seasonal high temperatures. The review focused on several safety-related systems, including the emergency feedwater (EFW) pumps, the service water (SW) pumps, and essential switchgear. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TSs), control room logs, and the corrective action program (CAP) to determine what temperatures or other seasonal weather could challenge these systems, and to ensure NextEra personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including NextEra's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot weather conditions.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate Alternating Current Power Systems

a. Inspection Scope

The inspectors reviewed plant features and procedures for the operation and continued availability of the offsite and alternate alternating current (AC) power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed NextEra's procedures affecting these areas and the communications protocols between the transmission system operator and NextEra. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether NextEra established and implemented

appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by reviewing condition reports (CRs), completed modifications and planned maintenance activities, and walked down portions of the offsite and AC power systems including the onsite switchyard, the unit and reserve auxiliary transformers, and the generator step-up transformers.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 'A' residual heat removal (RHR) on April 7
- 'B' EFW during 'A' EFW testing on June 13
- 'B' emergency diesel generator (EDG) during 'A' EDG maintenance outage from June 19-23

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether NextEra staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

During the period of June 19-23, the inspectors performed a complete system walkdown of accessible portions of the primary component cooling water (PCCW) system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, system diagrams, TSs, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field

walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and WOs to ensure NextEra appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that NextEra controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service (OOS), degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Containment elevation -26’ on April 4
- Containment elevation 0’ on April 4
- Containment elevation 25’ on April 4
- SW pump house ‘A’ train electrical room on June 28
- SW pump house ‘B’ train electrical room on June 28

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on June 1, 2017, that involved a simulated fire in the ‘B’ EDG room. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that NextEra personnel identified deficiencies, openly discussed them in a self-critical manner at the drill critique, and took appropriate corrective actions, as applicable. The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses

- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives were achieved

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes W04 and W07, containing 'A' train safety-related components, to verify that the cables were not submerged in water, that cables and associated splices appeared intact, and to observe the condition of cable support structures. The inspectors verified as-found water levels in the manholes upon opening, to ensure that the cables were not submerged, and the water was removed in accordance with station procedures.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the 'B' PCCW heat exchanger inspection during OR18 to ensure readiness and availability. The inspectors discussed the results of the most recent inspection with applicable NextEra staff and observed the as-found and as-left conditions. The inspectors verified that NextEra initiated appropriate corrective actions for identified deficiencies.

b. Findings

No findings were identified.

1R08 In-Service Inspection (711111.08P – 1 sample)

a. Inspection Scope

From April 17-21, 2017, the inspectors conducted an inspection and review of in-service inspection program activities in order to assess the effectiveness of NextEra's program for monitoring degradation of the reactor coolant system (RCS) boundary, risk-significant

piping and components, and containment systems during the Seabrook Unit 1, OR18. The sample selection was based on the inspection procedure objectives and risk priority of those pressure retaining components in systems where degradation would result in a significant increase in risk.

Non-destructive Examination and Welding Activities (IP Section 02.01)

The inspectors observed or reviewed documents related to the following non-destructive examination (NDE) and welding activities. Additionally the inspectors interviewed NextEra personnel involved in these activities.

- Observed portions of the manual ultrasonic test (UT) examination of SG 'A' girth weld RC-E11-A, seam 3, and reviewed the completed data sheet.

- Observed portions of the manual UT examination of high head safety injection pipe-to-pipe weld 17-UT-041 and reviewed the completed data sheet.

- Observed portions of the manual UT examination of an additional high head safety injection pipe-to-pipe weld (17-UT-038) and reviewed the completed data sheet.

- Reviewed the completed examination data for pipe to pipe weld 17-UT-002 in the main feedwater system.

For each examination, the inspectors verified these NDE activities were performed in accordance with the 2004 Edition, no Addenda, of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). The inspectors further verified the personnel and equipment were qualified in accordance with American Society of Mechanical Engineers (ASME), Section XI, Mandatory Appendix VIII, Article VIII-2000. Additionally the inspectors verified that indications and defects, if present, were dispositioned in accordance with the ASME Code.

Examination of Indications Previously Accepted for Service

There were no samples available for review during this inspection which involved examinations with recordable indications that had been accepted for continued service after evaluation or analysis following the previous outage (OR17).

Modification/Repair/Replacement Consisting of Welding on Pressure Boundary Risk Significant Systems

The inspectors reviewed WO package 4044473801, which described pre-fabrication by welding of AL-6XN stainless steel piping to replace existing SW pipe. The inspectors noted the WO package included weld travelers, NDE results, and welding fabrication and assembly guidance. The inspectors reviewed the welding and NDE records from three welds to verify whether the welding process was in conformance with ASME Code, Section XI Repair/Replacement requirements and that the work was completed by qualified welders and certified penetrant testing (PT) examiners.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities (IP Section 2.02)

Prior to OR18, NextEra engineering staff completed calculations utilizing ASME Code Case N-729-1 and concluded eddy current/ultrasonic examination of the reactor vessel

upper head (RVUH) penetration welds was not required this refueling outage. The inspectors reviewed the calculations to determine if the licensee's calculations were completed in accordance with the code case. The inspectors noted the calculation results indicated the next required examinations of the RVUH are required to be performed in 2020.

Boric Acid Corrosion Control Inspection Activities (IP Section 2.03)

The inspectors reviewed 49 CRs initiated by NextEra staff to document evidence of boric acid on plant components at the beginning of OR18. The inspectors selected and reviewed six boric acid evaluations to determine whether NextEra staff properly applied applicable corrosion rates, appropriate to the environment and assessed the effects of corrosion on structural or pressure boundary integrity.

Additionally, the inspectors reviewed the corrective actions completed prior to plant startup from OR18 to determine that the corrective actions were consistent with requirements of the ASME Code, Section XI and NextEra's CAP.

Steam Generator Tube Inspection Activities (IP Section 2.04)

Seabrook Station includes four Model F SGs manufactured with alloy 600 thermally treated tubes. The inspectors reviewed NextEra's examination plan for OR18 and observed a sampling of examination activities. Specifically, the inspectors determined a rotating coil was used to examine tubes from within the tube sheet expansion area up to three inches above the tube sheet. Using this method, all unplugged tubes in the 'A' and 'C' SGs were examined as were 50% of the tubes in SGs 'B' and 'D'. Additionally, NextEra staff planned for examinations using a "plus point probe" in tubes classified as high stress in all four SGs. Furthermore, visual exams were planned of all tube plugs and of the SG channel heads and bowls.

The inspectors observed NextEra staff collect a sample of eddy current data along with data reviews completed by NextEra's data resolution analysts. The inspectors further discussed the use of Electric Power Research Institute (EPRI) examination TS sheets to determine whether the associated equipment was appropriate for the expected types of tube degradation. The inspectors also discussed with the NextEra data resolution analyst their review of previous engineering change (EC) examination results and the comparison to current exam results from OR18, to verify NextEra's capability to assess future tube performance and plan for appropriate examinations. The inspectors reviewed a sample of results and discussed the process with the analysts to determine there were not pluggable tubes identified during OR18. The inspectors further verified that no in-situ pressure testing was required and there was not significant primary-to-secondary leakage measured over the operating cycle.

Identification and Resolution of Problems (IP Section 02.05)

The inspectors reviewed a sample of CRs which identified NDE indications, deficiencies and other nonconforming conditions since the previous refueling outage. The inspectors verified that nonconforming conditions were properly identified, characterized, evaluated, and that corrective actions were identified and entered into the CAP for resolution.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on May 22, 2017, which included a fast load reduction and a SG tube rupture. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed the control room operators complete a downpower and shutdown of the plant for entry into OR18 on April 1, 2017. This observation included procedure implementation, alarm and annunciator response, and reactivity oversight during power maneuvers and control rod manipulations. The inspectors also observed control room activities and alarm response activities on June 1, 2017. Additionally, on June 2, 2017, the inspectors observed the performance of a quarterly control rod operability surveillance, which included unexpected alarm response actions and oversight of reactivity manipulations. The inspectors observed these pre-shift/evolution briefings, and reactivity control briefings to verify that the briefings met the criteria specified in NextEra's Administrative Procedure OP-AA-100-1000, "Conduct of Operations," Revision 21. Additionally, the inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, and maintenance rule basis documents to ensure that NextEra was identifying and properly evaluating performance problems within the scope of the

maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with Title 10 of the *Code of Federal Regulations (*10 CFR) 50.65 and verified that the (a)(2) performance criteria established by NextEra staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that NextEra staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- SW/ultimate heat sink system health and maintenance effectiveness
- Oil inventory and preventive maintenance activities associated with EFW pumps
- Various maintenance activities during OR18 including the 'B' EDG heat exchanger tube replacement and the main steam isolation valve (MSIV) actuator replacements (QC)

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that NextEra performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that NextEra personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When NextEra performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- During drain down activities with minimum time to boil in the RCS on April 5 (OR18)
- SW valve maintenance with minimum time to boil in the RCS on April 7 (OR18)
- During mid-loop operations on April 18-19 (OR18)
- Train 'A' SW pump motor replacement on May 15-17
- MCC-514 outage affecting 'A' ocean SW loop and placing 'A' cooling water tower (CWT) loop in-service on May 25

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)

.1 Assessment of Degraded or Non-conforming Conditions

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Reactor coolant pump under voltage calibration on April 4
- 'B' PCCW temperature control valve, TCV-2271 failure on April 17
- RHR test isolation valve, RH-V-49 stroke time on May 7
- Loop 'A' SI accumulator rising level trend on May 15
- Loop 'B' RCS flow indication on May 18
- 'B' EFW pump inboard oiler emptied during testing on May 23
- Containment isolation valve for waste liquid drain tanks, 1-WLD-FV-8331, failed stroke time on May 24

The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to NextEra's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by NextEra.

b. Findings

No findings were identified.

.2 Assessment of Technical Specification Use and Application Introduction:

An Unresolved Item (URI) was identified because additional NRC review and evaluation is needed to determine whether one or more performance deficiencies and non-compliances exist. The inspectors identified an issue of concern (IOC) broadly related to Seabrook's use and application of TSs limiting conditions for operability (LCO). Specifically, performance deficiencies and non-compliances appear to exist when support systems or subsystems have not met the TS definition of operability and NextEra has not entered the associated supported systems' TS LCO and applied the required actions. The industry has sometimes used the term "cascading" to describe the impact of a support system's inoperability on supported systems. A specific example of this IOC involves an inoperable CWT, which is the seismically qualified portion of Seabrook's ultimate heat sink (UHS). The inspectors have questioned whether an inoperable CWT renders systems that it supports (PCCW, EDGs, and RHR) inoperable. Additional information is needed to determine whether one or more performance deficiencies and TS violations exist. A Task Interface Agreement has been submitted to the NRC's Office of Nuclear Reactor Regulation (NRR) to resolve the IOCs presented below regarding the correct application of Seabrook's TSs and the impact of an inoperable CWT on its supported systems.

Description:

Technical Specification Use and Application Concern:

The Seabrook TSs are based on NUREG-0452, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors." Seabrook TS 1.21 defines OPERABLE – OPERABILITY as a system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s), and when all necessary attendant instrumentation, controls, normal or emergency electrical power, **cooling** (emphasis added) and seal water, lubrication and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related **support** (emphasis added) function(s). TS 3.0.2 states that noncompliance with a specification shall exist when the requirements of the LCO and associated ACTION requirements are not met within the specified time intervals, except as provided in Specification 3.0.5. If the LCO is restored prior to expiration of the specified time intervals, completion of the ACTION requirements is not required.

Seabrook TS do not contain an exception to LCO 3.0.2, similar to LCO 3.0.6 in the Improved Standard Technical Specifications (ISTS) for Westinghouse Pressurized Water Reactors (NUREG-1431). The ISTS LCO 3.0.6 states, in part, when a **supported** system LCO is not met solely due to a **support** system LCO not being met, the Conditions and Required Actions associated with this **supported** system are not required to be entered. Only the **support** system LCO ACTIONS are required to be entered. This is an exception to LCO 3.0.2 for the supported system. In this event, an evaluation shall be performed in accordance with Specification 5.5.15, "Safety Function Determination Program (SFDP)."

Background and Licensing Basis:

Seabrook Station receives circulating and SW via two large tunnels that were mined a distance of over 3 miles to the Atlantic Ocean. SW is a safety-related system that provides cooling to the safety-related EDGs, PCCW, RHR, and other systems. The tunnels were lined with reinforced concrete following excavation. However, since the tunnels were not formally, seismically-qualified, a reinforced concrete mechanical draft CWT was constructed onsite as the UHS, to provide cooling water to safety-related systems following a seismic event that blocked more than 95 percent of the tunnel water flow to ensure that the requirements of General Design Criteria (GDC)-2, "Design Bases for Protection Against Natural Phenomena," are met. Seabrook's conformance with GDC-2 is described in the UFSAR Section 3.1.1.2. The design bases safety functions of the Station SW system and the UHS are described in UFSAR Sections 9.2.1.1 and 9.2.5.1, respectively. The PCCW system's conformance with GDC-44, "Cooling Water," is described in UFSAR Section 3.1.4.15.

Licensing Basis Amendments:

On April 7, 1993, by letter NYN-93052 (ML17191A390), the licensee submitted license amendment request (LAR) 93-02: "Service Water System/Ultimate Heat Sink OPERABILITY Requirements" (TAC No. M85750). The letter stated that the purpose of the LAR was to propose changes to the Seabrook TSs to redefine the requirements for an OPERABLE SW system and to consolidate the SW requirements with the requirements for the UHS. The letter continued by stating that the Seabrook TS 3/4.7.4 [in existence in 1993] required two OPERABLE SW loops with each loop having three

OPERABLE pumps (two [ocean] SW pumps and one cooling tower service water (CTSW) pump) when in Modes 1, 2, 3, and 4. The letter asserted that this requirement was unnecessarily restrictive since the second SW pump in each loop is not required for normal or design basis accident conditions and the associated CTSW pump provides the required redundancy during the postulated design basis event. Specifically, the letter stated, in part, "The proposed changes: (1) redefine an OPERABLE SW loop as having one OPERABLE SW pump and one OPERABLE CTSW pump;…" The letter continued by stating that the consolidation [of TS LCOs 3.7.4 and 3.7.5] is proposed to reduce the potential for confusion between the specifications and to control station operation in a manner consistent with the station design basis.

The inspectors identified that the TS wording changes submitted by the licensee and approved by the staff did change the actions for the SW system that consists of ocean SW and CTSW subsystems and ocean and atmospheric UHS. However, given the inspectors' understanding of the application of the TS, as described in the above section titled, "TS Use and Application Issue of Concern," the revised TS wording does not appear to be sufficient to relieve Seabrook from entering the applicable supported systems (EDGs and PCCW) LCOs when the associated SW subsystems are rendered inoperable.

By letter dated October 5, 1994, the NRC approved Amendment No. 32 to Facility Operating License NPF-86: Primary Component Cooling Water System Operability Requirements – LAR 93-01 and Service Water System/Ultimate Heat Sink Operability Requirements - LAR 93-02 (TAC M85491 and M85750). The approval letter (ML011800279) states, in part, that this amendment revises the Appendix A TSs relating to the operability requirements for the SW system and the UHS. The safety evaluation report (SER) states, in part, because the tunnels between the Atlantic Ocean and the pump house are not designed to seismic Category I requirements, a seismic Category I CWT is provided to protect against their failure due to a seismic event. Therefore, to meet the design basis for the SW system, each loop must have an operable SW pump and an operable CTSW pump. In addition, the SER states, in part, that the proposed changes to TS 3/4.7.4 reflect the design basis of the SW system in that with two operable loops, each having one operable SW pump and one operable CTSW pump (given each pump's UHS is operable), the system is capable of performing its safety function for all design basis events given the worst case single active failure, including the failure of either EDG. The staff also concludes that the consolidation of the SW system (TS 3.7.4) and UHS (TS 3.7.5) specifications to one TS LCO (3.7.4) was acceptable and necessary to achieve and maintain clarity, within the specifications, of the overall requirements for system operability.

The inspectors noted that the LAR and SER statements do not appear to coincide with the language in the approved Amendment No. 32, in that, the revised TS language identifies that the SW system is comprised of two subsystems with the ocean SW subsystem treated separately from CTSW subsystem. The inspectors also noted the addition of an allowed outage time (AOT) of 24 hours for two inoperable ocean SW pumps, and 72 hours for the CWT or two inoperable CTSW pumps. The inspectors noted that the LAR did not appear to identify or acknowledge that the licensing bases for Seabrook requires the CWT basin and one CTSW pump for the SW system to withstand the effects of natural phenomena such as an earthquake, without the loss of capability to perform their safety functions. Additionally, the LAR did not appear to identify or acknowledge that the licensing bases for Seabrook requires ocean SW to withstand the effects of natural phenomena such as tornadoes, without the loss of capability to perform their safety functions. Although these are low probability events, in a deterministic

licensing regime, the inspectors determined that consistent with the SER, and as detailed specifically by the licensee in the April 1993 LAR, an operable SW system should include two operable loops, with each having one operable ocean SW pump and one operable CTSW pump (given each pump's UHS is operable), such that the system is capable of performing its safety function for all design basis events, given the worst case single active failure, including the failure of either EDG.

Specific Examples of the Concern:

During the spring 2017 refueling outage, NextEra submitted a one-time LAR (ML17094A764) dated April 4, 2017, regarding the application of the CWT TS. Subsequently, the inspectors reviewed the records of Seabrook's CWT repair activities and OOS times since 2015 and monitored NextEra's outage activities. During the review of historical records, the inspectors identified several examples of what could be interpreted as TS inoperability for PCCW and the EDGs due to an inoperable CWT (TS 3.7.4.b) in Modes 1, 2, 3, and 4. Also, in Modes 5 and 6 during OR18, potential examples of what could be interpreted as TS inoperability were noted for the EDGs and the two RHR loops due to a non-functional CWT. It is important to note that the issue of concern associated with these examples would be based on a conclusion that the SW system / UHS LCO (3.7.4) provides a cooling water support function for both PCCW and EDG, in accordance with the TS definition (1.21) of OPERABILITY, in that the CWT is a necessary component of an OPERABLE SW / UHS due to its seismic qualification. Since the Seabrook TS do not contain an exception to LCO 3.0.2 similar to ISTS LCO 3.0.6 (NUREG 1431, Revision 4), the inspectors' position is that the SSCs supported by the UHS (EDGs, PCCW and RHR) could be interpreted as inoperable due to the inoperable UHS.

If it is assumed that an inoperable CWT train, a TS **support** system train, also renders the associated trains of its **supported** systems inoperable, the inspectors identified instances in the last 3 years where one or more trains of CWT SW inoperability may have exceeded the most limiting TS Action requirements for the associated supported systems. In these instances, NextEra did not enter the associated TS LCOs, and did not perform the applicable ACTIONS for the supported SSCs. Further, on the occasions that the CWT was inoperable, the supported EDG TS Surveillance Requirement 4.8.1.1.1.f(14) could not be met during the CWT maintenance. The inspectors' understand that typically the application of TS Surveillance Requirement 4.0.1 would hold and LCO 3.8.1 would not be met and all applicable ACTIONS for the inoperable EDG(s) would be required to be met within the specified time intervals. Below are two specific examples of the IOC:

- On June 9 through June 10, 2015 (approximately 24 hours), and on October 13, 2016 (approximately 18 hours), both trains of CTSW were inoperable for CWT basin cleaning and inspection while in Mode 1. For this support system, NextEra entered the TS Action 3.7.4.c that provides an AOT of 72 hours to restore at least one train to OPERABLE status or be in hot shutdown Mode 4 within 6 hours and cold shutdown Mode 5 within the following 30 hours (108 total hours). Upon inoperability of this support system (UHS), NextEra did not declare the supported systems (PCCW and the EDGs) inoperable and enter the associated TS Actions. If determined to be applicable, TS 3.7.3 and TS 3.8.1 would have required being in Mode 3 within 7 and 8 hours, and Mode 5 within 37 and 38 hours total, respectively.

- On April 19, 2017, with the 'B' EDG already inoperable, the 'A' CWT loop was removed from service to replace portions of its CWT pump discharge piping while the

plant was in Mode 6 (refueling) with less than 23 feet of water above the reactor flange. LCO 3.7.4 (SW / UHS) only applies in Modes 1, 2, 3, and 4. Before the transition to Mode 6, the 'B' EDG had been rendered inoperable for planned maintenance and testing while the plant was defueled and with no applicable operational mode. In Modes 5 and 6, LCO 3.8.1.2 requires one OPERABLE EDG and TS 3.0.4 requirements were met for entering Mode 6, in part, because of the operable 'A' EDG. While in Mode 6, both trains of ocean SW were operable to supply cooling water. However, the inspectors have interpreted that Seabrook's current licensing basis requires each EDG to be supported by its train of seismically qualified cooling water. If it is assumed that a seismically qualified source of cooling water was required on April 19, when the 'A' CWT loop was removed from service, its supported system, the 'A' EDG may have been rendered inoperable for a period of approximately 10 hours at the same time as the 'B' EDG was inoperable for maintenance. Additionally, the inspectors identified a second potential operability concern associated with the RHR system. Specifically, in Mode 6, LCO 3.9.8.2 requires two OPERABLE independent RHR loops while the water level is less than 23 feet above the top of the reactor vessel flange. With less than the required RHR loops OPERABLE, Action 3.9.8.2 requires immediate initiation of corrective action to return the required loops to OPERABLE status, or to establish greater than or equal to 23 feet of water above the reactor vessel flange, as soon as possible. This condition may have existed because the 'A' CWT loop was inoperable, which could be interpreted to have resulted in the 'A' RHR loop being inoperable for approximately 65 hours while the plant was in Mode 6 with less than 23 feet of water above the reactor flange.

Issues Requiring Resolution through the Task Interface Agreement Process:

1. Do the current Seabrook Station (50-443) license and TSs (TS 3.0.2) require parallel/simultaneous entry into both the support system (e.g., the SW system and UHS, TS 3.7.4) and the supported systems (e.g., Electrical Power Systems, AC Sources (diesel generators), TS 3.8.1 and PCCW System, TS 3.7.3) when the definition of OPERABLE (TS 1.21) is not met for the support system? Although one example is provided, the broader question requiring an answer is whether Seabrook is required to cascade their TS. The Seabrook TS have never included nor have been amended to incorporate the non-cascading provisions of ISTS 3.0.6 or the required, accompanying SFDP.

2. Does the October 5, 1994, License Amendment No. 32 on the SW system/UHS operability requirements give NextEra the latitude to remove the entire CWT from service for 72 hours even though it is needed to support key safety-related systems with much shorter LCOs (i.e., when both trains of those systems are OOS)?

3. If Amendment No. 32 allows the flexibility to remove both loops of the CTSW or the mechanical draft CWT for 72 hours without affecting the operability of the supported systems, is the current TS language consistent with this flexibility?

4. Do the current Seabrook Station (50-443) license and TSs (TSSR 4.8.1.1.1.f(14)) - require Seabrook to be capable of simulating each train's CWT actuation signal while the associated EDG is running at minimum accident loading when the CWT or a train of CTSW is removed from service and is inoperable for the AOT specified in TS 3.7.4 and does TS 4.0.1 need to be applied such that the failure to meet a TSSR, whether such failure is experienced during the performance of the surveillance or between

performances of the surveillance, shall be a failure to meet the LCO and would require taking the actions in TS 3.8.1.

NextEra Position:

Initially, NextEra stated its position in its April 4, 2017, one-time LAR (ML17094A764). Additional discussions with NextEra indicate that it is the licensee's position that entry into the support system TS alone is sufficient to comply with Seabrook TS 3.0.2 as written even though the Seabrook TS do not include a provision similar to ISTS 3.0.6. (Note: TS 3.0.2 states that noncompliance with a specification shall exist when the requirements of the LCO and associated Action requirements are not met within the specified time intervals, except as provided in TS 3.0.5. If the LCO is restored prior to expiration of the specified time intervals, completion of the Action requirements is not required.)

NextEra has since stated its position in this matter as documented in a position paper that can be found in ADAMS at ML17191A412. Specifically, NextEra asserts that the Seabrook SW system consists of two independent loops, each of which can operate with either a SW pump train or a CTSW pump train. NextEra interprets TS Amendment No. 32, approved in October 1994, as having evaluated the impact of SW TS (3.7.4) AOT for both a single and dual train unavailability of the CWT. NextEra believes that the proposed change and acceptance by the NRC staff recognized that the change was intended to redefine the requirements for both the PCCW and SW system as well as the UHS (i.e., the CWT in this case). NextEra believes that the LAR was proposed to take advantage of what the licensee believes to be a redundancy in the SW and UHS designs to provide enhanced operational flexibility. NextEra's reading of the SER for the amendment can be interpreted to have stated that the NRC staff agreed with the risk-based methodology and assumptions used, and that the change in SW system unavailability due to the proposed TS amendment and the resulting increase in the total reactor core damage frequency are insignificantly small. Further, NextEra interprets the amendment to read that the staff found the consolidation of the SW system and UHS into one TS to be acceptable and necessary to achieve and maintain clarity within the specifications of the overall requirements of system operability. (Note: NextEra remained silent regarding the need to meet the GDC requirements governing the protection against natural events for either UHS during the TS AOT.)

NextEra interprets the NRC's regulations to have stated that the SER associated with Amendment No. 32 is not actually part of the regulated licensing basis. Consequently, NextEra believes that a deterministic judgement that the current Seabrook TS was incorrectly made by the NRC via Amendment No. 32 should not be made. NextEra's interpretation is that Seabrook's licensing basis remains as originally approved, notwithstanding the current regulatory approach described in Inspection Manual Chapter (IMC) 0326 (but not in any regulation). Therefore, NextEra interprets the current TSs to allow removal of redundant portions of SW for limited time periods as recognition of the low probability for occurrence of a natural phenomenon event. Thus it is NextEra's position that any new changes to the language of the TS may provide greater clarity, but offer no substantial offsetting increase in safety.

Current Seabrook Administrative Controls:

In accordance with Seabrook's procedure, OPMM, Operations Management Manual, Revision 107, Operation's Management issued a Standing Operating Order (SOO 17-002) to the operating department to address the concern with the use and application of TS. The order was effective on February 27, 2017, and remains effective until future resolution of the issue, and revisions to Seabrook's manuals and programs are completed, as appropriate. The order describes the correct application of TS with respect to a supporting function and its potential effect on support system operability, with the exception of the disputed issue related to the CWT-impacted LCOs. In addition, the SOO directs the operators to carefully review TS in order to determine potential operability concerns with respect to the support and supported systems as they are taken OOS.

Additional corrective actions were taken to include training for the licensed operators to reinforce and ensure the correct use and application of TS in the future. Therefore, there is no immediate safety concern with respect to the issue of concern.

Unresolved Item:

The inspectors have coordinated with NRR through the use of the process described in NRR Office Instruction No. (COM-106), "Control of Task Interface Agreements," to review this URI regarding the correct application of Seabrook's TS and the impact of an inoperable CWT on its supported systems. Pending resolution this issue is unresolved. **(URI 05000443/2017002-01, Seabrook Station Use and Application of Technical Specifications).**

1R18 Plant Modifications (71111.18 – 2 samples)

Permanent Modifications

.1 1B Inverter Replacement

a. Inspection Scope

The inspectors evaluated the 1B inverter replacement during OR18, implemented by EC 282459, "Westinghouse Vital Inverter 'B' Replacement," Revision 2. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including the diesel loading calculations, heat loading in the Essential Switchgear 'B' environmental zone, and the modification test plan. The inspectors also reviewed revisions to various operation and control room alarm response procedures to ensure they could be reasonably performed.

b. Findings

No findings were identified.

.2 Service Water Piping Replacement for the Primary Component Coolant Heat Exchanger

a. Inspection Scope

The inspectors evaluated the design and replacement of the inlet SW piping associated with the 'B' PCCW heat exchanger, conducted in accordance with EC-288500. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the design change, including minimum thickness calculations, ultrasonic testing, implementation activities conducted under the WO process, and the post-modification testing.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- 'B' and 'C' MSIV actuator and stem replacements during OR18
- 'B' EDG heat exchanger tube replacement during OR18
- Emergency air handling flexible exhaust joint replacement on April 23
- CWT pump P-110A discharge piping replacement on April 24
- CWT fan gearbox heater replacement on May 10
- 'A' SW pump motor replacement during May 15-17

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the maintenance and refueling outage, conducted April 1 through May 1, 2017. The inspectors reviewed NextEra's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed operator performance and other attributes associated with portions of the shutdown and cooldown processes, and compliance with cooldown rates associated with TS. Further, the

inspectors reviewed multiple surveillance and other critical evolutions in the control room, and monitored controls associated with the following outage activities:

- Configuration, risk and outage management, including monitoring of key shutdown safety functions, and compliance with the applicable TSs when taking equipment OOS;
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing;
- Configuration and appropriate monitoring of reactor coolant level and temperature instruments, particularly during activities associated with the highest level of shutdown risk, which occurred during the RCS drain-down and reactor vessel head de-tensioning activities, as well as the drain-down to support RCS evacuation and fill;
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met;
- Verified contingency actions were in place, consistent with regulatory and station requirements, during ocean and CTSW system maintenance outage windows, and consistent with the OR18 outage shutdown risk review;
- Monitoring of decay heat removal operations, during initial onset into shutdown cooling, as well as activities associated with spent fuel pool cooling following full core offload;
- Observed various stages of NextEra's implementation of various modification and other activities, such as: installation of new feedwater regulating valves, multiple SW piping replacements, reactor coolant pump motor and seal replacements, main condenser tube inspections, 'B' EDG heat exchanger tube replacements, and MSIV stem replacements;
- Reactor water makeup and inventory controls, including appropriate flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss;
- Activities that could affect reactivity;
- Industrial Safety activities, including equipment heavy lifts consistent with the Memorandum of Understanding with the Occupational Safety and Health Administration;
- Refueling activities, including fuel handling during core offload and reload inside containment, and fuel handling in the spent fuel pool;
- Fatigue management that involved covered workers, and review of work hour controls and waivers;
- Prioritization and completion of mode hold CRs and WOs, and review of operating mode transition checklists;
- Performed a final containment closeout/walk-down to verify that debris or equipment had not been left inside, particularly in areas that could impact operability of the containment recirculation sumps; additionally, performed condition assessment of debris interceptor screens, scuppers and doorways that contribute to overall operability of the containment sumps and emergency core cooling systems and component;
- Reactor start-up, plant heat-up, and power ascension activities; and
- Problem identification and resolution action related to OR18 activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and NextEra procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied.

Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- Main steam safety valve testing on March 31
- RHR cold shutdown and containment isolation valve testing on April 13 (containment isolation valve test)
- 'A' charging pump in-service test (IST) surveillance on April 18 (in-service test)
- 'B' charging pump surveillance test on April 27
- Primary-to-secondary leak rate sample and calculation on June 9

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Evaluation (71114.02 – 1 sample)

a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the Seabrook Station Alert and Notification System (ANS). During this inspection, the inspectors conducted a review of the ANS testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency (FEMA) approved ANS Design Report to ensure compliance with design report commitments for system maintenance and testing. The inspectors toured the maintenance and testing facility for the Seabrook ANS, and interviewed the designated Seabrook staff responsible for the ANS. The Inspectors also observed the bi-weekly siren testing. The inspection was conducted in accordance with NRC Inspection Procedure 71114.02. Title 10 CFR 50.47(b)(5) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 – 1 sample)

a. Inspection Scope

The inspectors conducted a review of the Seabrook Station Emergency Response Organization's (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of key licensee staff to respond to an emergency event and to verify NextEra's ability to activate their emergency response facilities (ERFs) in a timely manner. The inspectors reviewed the Seabrook Station Emergency Plan for ERF activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, the most recent drive-in drill report, and corrective action reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. The inspection was conducted in accordance with NRC Inspection Procedure 71114.03. Title 10 CFR 50.47(b) (2) and related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses (71114.05 – 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of NextEra's efforts to maintain the Seabrook emergency preparedness (EP) program. The inspectors reviewed: Memorandums of Understanding with offsite agencies; the 10 CFR 50.54(q) Emergency Plan change process and practices; licensee maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary, backup, and alternate emergency response facility maintenance.

The inspectors further evaluated NextEra's ability to maintain their EP program through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, actual event reports, self-assessments, 10 CFR 50.54(t) review reports, and EP-related CRs. The inspectors reviewed a sample of EP-related CRs initiated at Seabrook from December 2015 through April 2017. The inspection was conducted in accordance with NRC Inspection Procedure 71114.05. Title 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for Unit 1 licensed operators on May 22, 2017, which required emergency plan implementation by an operations crew. NextEra planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that NextEra evaluators noted the same issues and entered them into the CAP.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 7 samples)

a. Inspection Scope

The inspectors reviewed NextEra's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR Part 20, TSs, Regulatory Guide 8.38, and the procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the performance indicators (PIs) for the occupational exposure cornerstone, radiation protection program audits, and reports of operational occurrences in occupational radiation safety since the last inspection.

Radiological Hazard Assessment (1 sample)

The inspectors conducted independent radiation measurements during walkdowns of the facility and reviewed the radiological survey program, air sampling and analysis, continuous air monitor use, recent plant radiation surveys for radiological work activities, and any changes to plant operations since the last inspection to verify survey adequacy of any new radiological hazards for onsite workers or members of the public.

Instructions to Workers (1 sample)

The inspectors reviewed high radiation area (HRA) work permit controls and use, and observed containers of radioactive materials and assessed whether the containers were labeled and controlled in accordance with requirements.

The inspectors reviewed several occurrences where a worker's electronic personal dosimeter alarmed. The inspectors reviewed NextEra's evaluation of the incidents, documentation in the CAP, and whether compensatory dose evaluations were conducted when appropriate. The inspectors verified follow-up investigations of actual radiological conditions for unexpected radiological hazards were performed.

Contamination and Radioactive Material Control (1 sample)

The inspectors observed the monitoring of potentially contaminated material leaving the radiological controlled area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

Radiological Hazards Control and Work Coverage (1 sample)

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walkdowns and observation of radiological work activities. The inspectors assessed whether posted surveys; radiation work permits (RWPs); worker radiological briefings and radiation protection job coverage; the use of continuous air monitoring, air sampling and engineering controls; and dosimetry monitoring were consistent with the present conditions. The inspectors examined the posting and physical controls for selected HRAs, locked high radiation areas (LHRAs), and very high radiation areas (VHRAs) to verify conformance with the occupational PI.

Risk-Significant HRA and VHRA Controls (1 sample)

The inspectors reviewed the procedures and controls for HRAs, LHRAs, VHRAs, and radiological transient areas in the plant.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 sample)

The inspectors evaluated radiation worker performance with respect to radiation protection work requirements. The inspectors evaluated radiation protection technicians in performance of radiation surveys and in providing radiological job coverage.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with radiation monitoring and exposure control (including operating experience) were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

2RS2 Occupational As Low As Is Reasonably Achievable Planning and Controls (71124.02 – 4 samples)

a. Inspection Scope

The inspectors assessed NextEra's performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements contained in 10 CFR Part 20, Regulatory Guides 8.8 and 8.10, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted a review of Seabrook Station's collective dose history and trends, ongoing and planned radiological work activities, previous post-outage ALARA reviews, radiological source term history and trends, and ALARA dose estimating and tracking procedures.

Radiological Work Planning (1 sample)

The inspectors selected the following radiological work activities based on exposure significance for review:

- RWP 17-0105, Reactor Cavity Work including Guide Card Work, Reactor Head Lift and Return to Vessel Flange, December 9, 2016
- RWP 17-0107, Reactor Cavity Decontamination Activities, December 9, 2016
- RWP 17-0108, Fuel Transfer Canal Work and Fuel Transfer System Inspection and Maintenance in CTB, December 9, 2016
- RWP 17-0120, Steam Generator Primary Side Work, December 9, 2016

For each of these activities, the inspectors reviewed: ALARA work activity evaluations, exposure estimates, exposure reduction requirements, results achieved (dose rate reductions, actual dose), person-hour estimates and results achieved, and post-job reviews that were conducted to identify lessons learned.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the current annual collective dose estimate, basis methodology, and measures to track, trend, and reduce occupational doses for ongoing work activities.

Implementation of ALARA and Radiological Work Controls (1 sample)

The inspectors observed radiological work activities and evaluated the in-plant use of shielding and other engineering work controls based on the radiological controls and ALARA plans those activities. The inspectors reviewed NextEra activities associated with ALARA reviews of work-in-progress. The inspectors verified that the ALARA staff are involved with emergent work activities and for revising associated RWPs/ALARA Plans during the outage.

Radiation Worker Performance (1 sample)

The inspectors observed radiation worker and radiation protection technician performance during radiological work to evaluate worker ALARA performance according

to specified work controls and procedures. Workers were interviewed to assess their knowledge and awareness of planned and/or implemented radiological and ALARA work controls.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with ALARA planning and controls were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 3 samples)

a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR Part 20, Regulatory Guides 8.15 and 8.25, NUREG/CR-0041, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR to identify ventilation and radiation monitoring systems associated with airborne radioactivity controls and respiratory protection equipment staged for emergency use. The inspectors also reviewed respiratory protection program procedures and current PIs for unintended internal exposure incidents.

Engineering Controls (1 sample)

The inspectors reviewed operability and use of both permanent and temporary ventilation systems, and the adequacy of airborne radioactivity radiation monitoring in the plant based on location, sensitivity, and alarm set-points.

Use of Respiratory Protection Devices (1 sample)

The inspectors reviewed the adequacy of NextEra's use of respiratory protection devices in the plant to include applicable ALARA evaluations, respiratory protection device certification, respiratory equipment storage, air quality testing records, and individual qualification records.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by NextEra's CAP.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – 5 samples)

a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR Part 20, Regulatory Guides 8.9 and 8.34, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed radiation protection program audits, National Voluntary Laboratory Accreditation Program (NVLAP) dosimetry testing reports, and procedures associated with dosimetry operations.

Source Term Characterization (1 sample)

The inspectors reviewed the plant radiation characterization (including gamma, beta, alpha, and neutron) being monitored. The inspectors verified the use of scaling factors to account for hard-to-detect radionuclides in internal dose assessments.

External Dosimetry (1 sample)

The inspectors reviewed dosimetry NVLAP accreditation, onsite storage of dosimeters, the use of "correction factors" to align electronic personal dosimeter results with NVLAP dosimetry results, dosimetry occurrence reports, and CAP documents for adverse trends related to external dosimetry.

Internal Dosimetry (1 sample)

The inspectors reviewed internal dosimetry procedures, whole body counter measurement sensitivity and use, adequacy of the program for whole body count monitoring of plant radionuclides or other bioassay technique, adequacy of the program for dose assessments based on air sample monitoring and the use of respiratory protection, and internal dose assessments for any actual internal exposure.

Special Dosimetric Situations (1 sample)

The inspectors reviewed NextEra's worker notification of the risks of radiation exposure to the embryo/fetus, the dosimetry monitoring program for declared pregnant workers, external dose monitoring of workers in large dose rate gradient environments, and dose assessments performed since the last inspection that used multi-badging, skin dose, or neutron dose assessments.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Emergency Preparedness (3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP PIs: (1) Drill and Exercise Performance; (2) ERO Drill Participation; and, (3) ANS Reliability. The last NRC EP inspection at Seabrook was conducted in the 2nd calendar quarter of 2016. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the first calendar quarter of 2016 through the first calendar quarter of 2017 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 7, was used as reference criteria.

b. Findings

No findings were identified.

.2 Reactor Coolant System Specific Activity and Reactor Coolant System Leak Rate (2 samples)

a. Inspection Scope

The inspectors reviewed NextEra's submittal for the RCS specific activity and RCS leak rate performance indicators for Seabrook Unit 1 for the period of April 1, 2016, through March 21, 2017. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the performance indicator.

b. Inspection Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 3 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify NextEra entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening

meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, NextEra performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues documented by NextEra in quarterly trend reports, site performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed NextEra's CAP database for the first and second quarters of 2017 to assess CRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 4OA2.1). The inspectors reviewed the NextEra quarterly trend report for the first quarter of 2017, conducted under PI-AA-207-1000, Station Self-Evaluation and Trend Analysis, Revision 7, to verify that NextEra personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

Beginning in 2017, the inspectors noted that NextEra as a fleet revised the trending programs that existed onsite. In particular, the monthly departmental trend inputs, for those departments required to perform trend analyses, were changed to quarterly. In addition, the trends were now identified on what are referred to as the Department Trend Analysis (11x17 paper format) focused more on people and process gaps and trends, and reviewed by the Performance Improvement group in generating the quarterly station analysis results, also contained in a concise 11x17 format. The more traditional equipment-related, equipment reliability issues are captured, assessed and tracked in the Engineering System Health Reports.

The inspectors did not identify any trend that was not already identified by individual departments. For example, the gaps identified in Operations regarding crew leadership were appropriately captured in the new 11x17 report. However, the emerging focus on human error reduction and the use of reduction tools and reinforcement of maintenance fundamentals will be reviewed during the next assessment, following the human performance and configuration control errors that resulted in the April 29 manual reactor trip.

.3 Annual Sample: Containment Boundary Integrity Verification

a. Inspection Scope

The inspectors performed an in-depth review of the containment boundary at the Seabrook Plant. Specifically, the inspectors reviewed CR 02084748 which described the containment boundary liner leak chase plugs located in the concrete floor of the containment structure that provide a pathway for examination of the buried channels covering the containment liner welds located under the containment concrete floor. Additionally, the inspectors reviewed action request (AR) Nos.: 02084748, 02080584, 02085763, 02085411, 02194807, 02086804, and 02086808 regarding actions taken to address various identified, but minor containment liner conditions. The areas of the containment boundary evaluated included sample areas of the plate surface of containment, the interior condition of the mechanical and electrical penetrations that pass through the containment, and the junction between the containment liner and the concrete floor of containment, the floor plug entries to the test channels under the containment concrete floor, and the containment steel liner. Observations were made by the inspectors at the accessible elevations of the containment structure. Additionally the inspectors observed floor plug locations and reviewed video records of floor plug removal and examination of the ½" diameter tubes leading to imbedded test channels covering containment liner welds under the concrete floor. The floor plug removal and channel visual examinations were in response to NRC Information Notice 2010-12. The inspectors reviewed CRs and corrective actions associated with the containment boundary for work done during the previous OR17 refuel outage and that planned or completed during the current refuel outage, OR18. Related WOs were sampled. The scope of subsequent examinations of the containment boundary as required by the ASME Code Section XI, Subsection IWE requirements for examinations during the remainder of the current 10 year inspection interval were reviewed.

The inspectors assessed Seabrook's containment related evaluations, extent of condition review, completed and proposed corrective actions, and the prioritization and timeliness of actions to evaluate whether the corrective actions were appropriate. The inspectors interviewed the responsible containment boundary engineer and reviewed Seabrook's evaluation of the status of the corrective actions taken to ensure integrity the containment boundary. Plans, including meeting the IWE subsection of the ASME Code Section XI, for future observations and visual examinations were reviewed to verify these requirements were met.

b. Findings and Observations

No findings were identified.

The inspectors determined that Seabrook's evaluation of the containment boundary, including the overall liner, penetration intersections, floor plug to channel access areas, liner to floor intersections and extent-of-condition review were thorough, and the items for corrective action were appropriately identified with corrections made or scheduled. Specifically, the inspectors determined that the conditions to be repaired, often by pre-coating surface preparation and recoating, were listed and located by their elevation and azimuth position. Furthermore, the inspectors determined on a sampling basis during the refueling outage that the current condition of the containment boundary was confirmed by examination of appropriate locations in the containment structure. The inspectors further determined that, on a sampling basis, the corrective actions and work processes were reasonable and in accordance with Seabrook procedures.

.4 Annual Sample: Alkali-Silica Reaction Monitoring

a. Inspection Scope

The purpose of periodic site visits to Seabrook Station over the past few years has been to review the adequacy of NextEra's monitoring of alkali-silica reaction (ASR) on affected reinforced concrete structures, per their 10 CFR 50.65 "Maintenance Rule" Structures Monitoring Program. In addition, the inspectors verify on a sampling basis that significant changes or different presentations of ASR on the affected structures are appropriately considered for impact on the Seabrook prompt operability determinations (PODs) for the affected structure(s). Two region-based inspectors and a structural engineer from NRR were on site the week of June 5, 2017, to conduct an inspection of ongoing ASR-related activities. Additionally, the inspectors maintained awareness of activities related to an audit conducted the same week by NRR staff members reviewing NextEra's License Amendment Request 16-03, dated August 1, 2016, (ML16216A240). The inspectors also conducted in-office reviews of ASR-related documentation made available after the conclusion of the on-site inspection via an electronic server.

The inspectors assessed the problem identification threshold, operability and functionality assessments, extent of condition reviews, and the prioritization and timeliness of corrective actions to determine whether NextEra personnel were appropriately identifying, characterizing, and correcting problems associated with the ASR-affected structures. The inspectors evaluated NextEra's actions to verify compliance with the Structures Monitoring Program, the CAP, and 10 CFR Part 50, Appendix B requirements.

b. Findings and Observations

No findings were identified.

The inspectors toured Seabrook Station with responsible NextEra staff to examine ASR-affected structures and systems and to status NextEra's activities associated with crack monitoring and associated instrumentation, including the through-wall expansion monitors (extensometers). The inspectors also:

- Examined crack gages and extensometers placements in the RHR/CS Vault, B Electrical Tunnel, Diesel Generator Building, Control Building, Fuel Storage Building, Intake Structure, Primary Auxiliary Building, Condensate Storage Tank, and Service Water Pump House, including a review of initial data collected from extensometers at these locations.
- Reviewed the results from the 2016 ASME IWL Examination, dated December 8, 2016, and an associated evaluation of the 2016 IWL examination results compared to the 2010 ASME IWL examination.
- Discussed structural deformation measurement techniques with field engineers working in the B Electrical Tunnel.
- Reviewed completed WO 40475286, EC 287308 and associated documentation involving the removal of cover concrete from containment enclosure building missile shield block MSB-1.
- Reviewed AR 2129621, Revision 2, Prompt Operability Determination for "Seismic Isolation Gaps between Containment and Containment Enclosure Building is less than Specified Value," dated 02/15/2017.
- Reviewed AR 02014325, "Consolidation of Building Deformation Prompt Operability Determinations," Revision 0, dated 06/13/2017.

- Reviewed AR 01664399, “Consolidation of PODs for Reduced Concrete Properties in ASR Affected Seismic Category I Structures,” Revision 01, dated 03/16/2017.
- Reviewed AR 02134569, “Fuel Storage Building Structure Monitoring Data,” Revision 01, dated 06/30/2016.
- Reviewed Seabrook Station Program Manual – Structures Monitoring Program Manual (SMPM), Revision 01.
- Reviewed Seabrook Mechanical Maintenance Procedures - Periodic Monitoring of Concrete Expansions Geokon Snap-Ring Borehole Extensometers, Revision 02 and Installation of Geokon Snap-Ring Borehole Extensometers, Revision 09.

The inspectors observed a noteworthy change in NextEra’s administration of the Structures Monitoring Program, including transfer of program ownership to the Seabrook License Renewal Project from the Design Engineering Department. The previous Maintenance Rule program (Engineering Department Standard 36180, “Structures Monitoring Program,” Revision 09) was significantly revised and restructured under the “Structures Monitoring Program Manual (SMPM),” Revision 01. The SMPM included considerably more detailed implementation guidance for ASR-related material properties and structural deformation monitoring and assessment, and also governed ground water sampling and analysis requirements, consistent with American Concrete Institute 349.3R, “Evaluation of Existing Nuclear Safety-Related Concrete Structures.” The inspectors determined that as NextEra completes Stage 1, 2 and 3 structural evaluations, they planned to revise the associated consolidated PODs, as appropriate, and update their SMPM, Appendix C, “Building Deformation Monitoring Tables,” to ensure that critical structural monitoring parameters will be periodically checked and evaluated against established limits. Based upon a sampling review of completed structural evaluations, the inspectors observed that NextEra staff were appropriately implementing their revised station SMPM and that information from ASR-related monitoring activities and recently completed engineering evaluations were appropriately entered into the station’s CAP and updates were made to the SMPM.

In addition, the inspectors determined NextEra commenced a transition from crediting individual structure’s PODs to documenting their conclusions in two consolidated PODs. One consolidated POD addressed the impact of ASR on material properties changes in the affected concrete and a second consolidated POD addressed internal structural loading and relative deformation due to bulk expansion within affected structures and external loading due to ASR expansion of concrete backfill. The inspectors noted that the consolidated material properties POD (AR 01664399) no longer relied upon the licensee’s original “margins” methodology. NextEra staff initially provided reasonable assurance of structural performance by comparing the Seabrook structures’ design basis calculations of record against assumed worse-case laboratory derived (unrestrained) ASR-affected concrete specimen material properties and assuring sufficient design capacity margin to demonstrate continued functionality of ASR-affected structures. NextEra’s current consolidated material properties POD used the University of Texas - Austin, Ferguson Structural Engineering Laboratory (FSEL) large-specimen testing program results to demonstrate reasonable assurance of safety, provided the ASR expansion of Seabrook Station ASR-affected structures remained within the bounds of the FSEL testing. Based upon NRC staff’s observation of the FSEL testing program and consideration of the limits of the testing program (with respect to the measurable extent of ASR degradation), the inspectors considered the interim use of the FSEL large specimen testing program results for demonstrating reasonable assurance of operability of ASR-affected structures to be acceptable although non-conforming. Long-term acceptability of the FSEL testing program results for resolving the design non-conformance is the subject of Seabrook LAR 16-03 and NRC staff review.

While NextEra no longer relied on the “margins” methodology for structural operability determinations, the NRC inspectors concluded that this approach of using a bounding comparative analysis (worst case ASR degraded concrete material properties compared to as-built values and the established design margins) remained a valid analytical method. The NRC inspectors considered the use of the FSEL large-scale specimen testing results for an assessment of operability provided a reasonable and potentially more realistic assessment of structural performance as the testing (at the observed levels of ASR degradation) more closely replicated the interaction between ASR degraded concrete and reinforcement design under loaded conditions.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 - 1 sample)

Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, “Reactive Inspection Decision Basis for Reactors,” for consideration of potential reactive inspection activities. As applicable, the inspectors verified that NextEra made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed NextEra’s follow-up actions related to the event to assure that NextEra implemented appropriate corrective actions commensurate with their safety significance.

- Manual reactor trip on April 29, following wide range level indication and control issues associated with the ‘B’ SG (EN 52718).

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On July 27, 2017, the inspectors presented the inspection results to Mr. Eric McCartney, Site Vice President, and other members of the Seabrook Station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
E. McCartney, Regional Vice President – Northern Region
C. Domingos, Plant General Manager
R. Harrsch, Operations Director
D. Ritter, Training Manager
K. Boehl, ALARA Engineer
V. Brown, Licensing, Regulatory Affairs
K. Browne, Licensing Manager
A. Chesno, Performance Improvement Director
D. Currier, Emergency Preparedness Manager
R. Wheaton, Maintenance Director
S. Folsom, Acting Maintenance Director
S. Hamel, NDE Level III
F. Haniffy, Radiation Protection Analyst
R. Maurer, Westinghouse Level III
R. Parry, Engineering Programs Manager
D. Robinson, Chemistry Manager
D. Slivon, NextEra Section XI Program Manager
D. Strand, Radiation Protection Manager
K. Thompson, NextEra SG Engineering

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened

05000443/2017002-01	URI	Seabrook Station Use and Application of Technical Specifications. (Section 1R15.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
ODI.102, NUC-001 Nuclear Plant Interface Coordination with Transmission Entities, Revision 3
ODI.90, 345kV Electrical Disturbance Communications, Analysis and Reporting Guidelines, Revision 14
ODI.110, Transformer Oil Analysis and Notifications, Revision 00
ON1246.03, GSU Trouble, Revision 12
OP-AA-102-1002, Seasonal Readiness, Revisions 17 and 18

Condition Reports
2172741 2185010 2185530 2185555 2195936 2205331 2294794

Maintenance Orders/Work Orders
40245042 40346272 40383538 40418722 40428118 40484476 40484563 40513805 40515222

Miscellaneous
EC 282193, 345kV SF6 Bus 2 Upgrade
Preventive Maintenance Activity SY-BD-SF6-E-100-000, SY Weekly Rounds
Seasonal Readiness Certification – Summer 2017, dated 5/24/17

Section 1R04: Equipment Alignment

Procedures
DBD-CC-01, Design Basis Document Primary Component Cooling Water System, Revision 6
EN-AA-203-1001, Operability Determinations / Functionality Assessments, Revision 25
OS1012.04, Primary Component Cooling Water Loop B Operation, Revision 27
OS1013.03, Residual Heat Removal Train A Startup and Operation, Revision 4
OX1412.06, Monthly PCCW Loop B Valve Verification, Revision 9

Condition Reports
2185680 2188006 2137157 2137160 2204702 2170921

Maintenance Orders/Work Orders
40402453 40529413

Miscellaneous
UFSAR 9.2, Revision 14

Drawings
1-CC-B20211, Primary Component Cooling Loop 'B' Detail, Revision 22
1-CC-B20212, Primary Component Cooling Loop 'B' Detail, Revision 13
1-CC-B20213, Primary Component Cooling Loop 'B' Detail, Revision 14
1-CC-B20205, Primary Component Cooling Loop 'A' Detail, Revision 26
1-CC-B20206, Primary Component Cooling Loop 'A' Detail, Revision 16
1-CC-B20207, Primary Component Cooling Loop 'B' Detail, Revision 12
1-RH-B20662, Residual Heat Removal System Train A Detail, Revision 24
1-SI-B20450, Safety Injection System Low Head Injection (Accumulators) Detail, Revision 14
1-FW-B20685, Emergency Feedwater System Overview, Revision 4
1-FW-B20688, Emergency Feedwater System Details, Revision 22

Section 1R05: Fire Protection

Procedures
FP-AA-104-1003, Fire Response, Revision 0
FPI.67B, Fire Drill Evaluation Form, Revision 5
FPI.67C, Fire Drill Self Critique Guide, Revision 5
FPI.67F, Control Room Fire Drill Evaluation Form, Revision 5
FPI.67H, Drill Information, Pictures and Prompts, Revision 5
OS1200.00, Response to Fire or Fire Alarm Actuation, Revision 23

Miscellaneous
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, C-F-1-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, C-F-2-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, C-F-3-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, SW-F-1B-A
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, SW-F-1C-A

Section 1R06: Flood Protection Measures

Condition Reports
2205835

Maintenance Orders/Work Orders
40209732-31

Drawing
9763-F-310248, Underground Duct Plan, Revision 13

Section 1R07: Heat Sink Performance

Procedures
ES1807.025, Inservice Inspection Visual Examination Procedure, Revision 06
MS0515.60, Heat Exchanger Tube Cleaning and Inspection, Revision 1

Condition Reports
219630 1872576

Maintenance Orders/Work Orders
40427261

Miscellaneous
FP57863, Thermal-Hydraulic Analysis F/PCCW Heat, dated September 27, 1996

Section 1R08: In-Service Inspection

Condition Reports

02193487	02193488	02193489	02193491	02193493	02193494
02193495	02193497	02193498	02193499	02193500	02193501
02193503	02193505	02193507	02193509	02193511	02193513
02193514	02193516	02193518	02193520	02193521	02193522
02193524	02193527	02193528	02193529	02193531	02193532
02193533	02193535	02193808	02196472	02196496	02196516
02196534	02196537	02196784	02196785	02196786	02196788

Miscellaneous
Boric Acid Corrosion Evaluation, 1-CBS-SKD-161
Boric Acid Corrosion Evaluation, 1-RC-V-343
Boric Acid Corrosion Evaluation, 1-CS-V-162
Boric Acid Corrosion Evaluation, 1-BRS-P-100-A
Eddy Current Examination Technique Specification Sheet, ETSS# 20510.1
Eddy Current Examination Technique Specification Sheet, ETSS # 21998.1
Eddy Current Inspection, Multi-Frequency Eddy Current Parameters, Analysis Technique Sheet (ANTS) # NAH-D-117
Eddy Current Inspection, Multi-Frequency Eddy Current Parameters, Acquisition Technique Sheet (ACTS) # NAH-06-117
Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, PDI-UT-2, Revision G, July 20, 2016 (under Seabrook cover sheet ES03-01-22, Revision 5)

Manual Ultrasonic Procedure for the Examination of Non-RPV Nozzle-to-Shell Welds in Vessels >2"; UT-110, Revision 4, Mach 23, 2016 (under Seabrook cover sheet ES10-01-39, Revision 3)
Performance Demonstration Database
Seabrook OR18 Condition Monitoring and Operational Assessment, SG-SGMP-17-13, Revision 0, April 2017
Seabrook Appendix H & I Techniques, Hot Leg Tube sheet Rotating Coil Inspection, MRS-TRC-2319, April 2017
Seabrook Station Steam Generator Eddy Current Data Analysis Guidelines Manual, Revision 7, April 4, 2014
Steam Generator Degradation Assessment for Seabrook OR18 Refueling Outage, SG-SGMP-17-1, Revision 3, April 2017
Visual Examination (VE) Procedure For Reactor Vessel Upper Head (RVUH) Penetration Inspections (N-729-1)

NDE Data Sheets and Implementation Examination Procedures:
17-UT-041, Pipe-to-Pipe: SA376, TP316 Procedure ESO3-01-22, April 15, 2017
17-UT-038, Pipe-to-Pipe: SA376, TP316 Procedure ES03-01-22, April 15, 2017
RC E-11D 2A-IR, SG Girth Weld, ES10-01-38, April 13, 2017
RC E-11D 2A-IR, D SG Primary Nozzle Inner Radius, April 13, 2017
RC E-11A 16 NZ, Nozzle to shell weld, Carbon Steel, 4/18/17, Procedure ES1807.003, Magnetic Particle Examination, NRI, April 18, 2017
RC RPV Interior, 17-VT#-041, Procedure ES 1 807.025, RV Interior, April 14, 2017
RH 0163-05-02, Procedure ES03-01-22, Pipe-to-Pipe, RHR, April 13, 2017
FW Pipe-to-Pipe, procedure ES 03-01-21, April 3, 2017
FW 4606-03-10, Pipe-to-Pipe, Procedure ES03-01-21, April 13, 2017
RC E-11a Seam-3, SG A Seam Weld, procedure ES10-01-39 April 13, 2017
RC E-11A Seam-3, SG A Shell Circumferential Weld, Carbon Steel April 13, 2017
RC E-11A 16-NZ, Magnetic Particle Examination, Nozzle-to-shell weld

Section 1R11: Licensed Operator Requalification Program

Procedures
AD-AA-100-1006, Procedure and Work Instruction Use and Adherence, Revision 12
OP9.2, Transient Response Procedure User's Guide, Revision 17
OX1410.02, Quarterly Rod Operability Surveillance, Revision 15
TR-AA-230-1007, Conduct of Simulator Training and Evaluation, Revision 4

Maintenance Orders/Work Orders
40508532

Miscellaneous
Procedure Change Request 2208519

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-100-2002, Maintenance Rule Program Guidance, Revision 4
MA4.9, Control and Storage of Equipment and Material, Revision 18
MA-AA-203-1001, Maintenance Planning, Revision 8
NAQA1-3, Quality Assurance Manual, Revision 54
PEG-5, Maintenance Rule Program Monitoring Activities, Revision 11
PEG-94, Service Water Inspection and Repair Trending, Revision 9

Condition Reports
1637922 2205550 2205399 2023931 2008562 2200623
2206716 2212697

Maintenance Orders/Work Orders
40514565 40361768 40361770 40537229 40530709

Miscellaneous
FP22896, Emergency Feedwater Pumps Instruction Manual, Revision 18
MMOD 98-0601, EFW Pump Oil Level Indicator
Preventive Maintenance Item No. 8263, FW-P-37-A-L4, Turbine Driven Emergency Feedwater Pump Lube Oil Samples
Preventive Maintenance Item No. 8270, FW-P-37-B-L4, Motor Driven Emergency Feedwater Pump Lube Oil Samples
UFSAR 8.3.1.1.g, Revision 14

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
NAWM, Work Management Manual, Revision 68
ODI.101, Guarded Equipment Recommendations for Refueling Outages, Revision 16
OM-AA-101-1000, Shutdown Risk Management, Revision 13
OS1016.11, Contingency Ocean Pump Restoration for SW Work Activities with Ocean Service, Revision 7
SBK-1FJR-17-001, OR18 Outage Schedule Shutdown Risk Review, Revision 0
WM-AA-100, Risk Management Program, Revision 0
WM-AA-100-1000, Work Activity Risk Management, Revision 8
Water Pumps Not In Service, Revision 7

Condition Reports
2182294

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
EN-AA-203-1001, Operability Determinations / Functionality Assessments, Revision 25
EX1806.001, RPS and ESFAS Response Time Summation Procedure, Revision 11
LX0563.02, Reactor Coolant Pump Undervoltage Channel Calibration, Revision 17
OX1490.05, Miscellaneous Systems ASME Quarterly Valve Stroke Test, Revision 7
OX1456.81, Operability Testing of IST Valves, Revision 26

Condition Reports
2195832 2196385 2196114 2196047 2199341 2203704
2205726 2185664 2204955 2207011 2207123 2207126
2206716

Maintenance Orders/Work Orders
40420081 40474291 40479253

Miscellaneous
UFSAR Chapter 5.2, Revision 14
UFSAR Chapter 7, Revision 11

Drawings
1-NHY-250000, Data Sheets for Motor and Air Operated Valves and Dampers, Revision 83

Section 1R18: Plant Modifications

Procedures
EN-AA-202-1001, Engineering and Change Scope Screening, Revision 7
EN-AA-205-1100, Design Change Packages, Revision 13
EN-AA-100-1002, Design Verification, Revision 3
ES1807.012, Ultrasonic Thickness Measurements, Revision 7
MA3.5, Post Maintenance Testing, Revision 20
MA-AA-203-1000, Maintenance Testing, Revision 7

Condition Report
2199166

Maintenance Orders/Work Orders
40363938 40516918

Miscellaneous
ECs 282459, 288500

Drawings
1-NHY-310043 Sheet 2, 120VAC Vital Instrument Buses One Line Diagram, Revision 1

Section 1R19: Post-Maintenance Testing

Procedures
ES1807.012, Ultrasonic Thickness Measurements, Revision 7
IS0652.952, Main Steam Isolation Valve MS-V-88 Actuator Removal and Install, Revision 4
MA3.5, Post Maintenance Testing, Revision 20
MA-AA-203-1000, Maintenance Testing, Revision 7
MS14-01-01, SW System Liner Inspection, Resolution and Repair, Revision 3
OX1426.27, DG 1B Semiannual Operability Surveillance, Revision 26
OX1430.01, Main Steam Isolation Valve Stroke Test, Revision 10
OX1456.81, Operability Testing of IST Valves, Revision 25 and 26

Condition Reports
2200344 2199973 2199209

Maintenance Orders/Work Orders
40361768 40361770 40363049 40380551 40426593 40426594
40514565 40458024 40476726 40526553 40545068 40477421
40494687 40530269

Miscellaneous
ECs 284962, 288598

Section 1R20: Refueling and Other Outage Activities

Procedures
AD-AA-101-1004, Work Hour Controls, Revision 8
ODI.101, Guarded Equipment Recommendations for Refueling Outages, Revision 17
OS1000.03, Plant Shutdown From Minimum Load To Ho Standby, Revision 33
OS1000.04, Plant Cooldown from Hot Standby to Cold Shutdown, Revision 59
OS1000.07, Approach To Criticality, Revision 15
OS1000.10, Operation At Power, Revision 38
OS1000.14, Reactor Coolant System Evacuation and Fill, Revision 27
OS1013.03, Residual Heat Removal Train A Startup and Operation, Revision 34
OS1001.02, Draining the Reactor Coolant System for Vessel Head Removal, Revision 21
OS1001.11, Reactor Coolant System Shutdown Level Instrumentation, Revision 11
OS1015.10, Refueling Canal and Cavity Drain, Revision 23
RS1735, Reactivity Calculations, Revision 9
RS1737, Post Refueling Low Power Physics Testing, Revision 7
SY-AA-100-1000, Fitness for Duty, Revision 6
SY-AA-100-1011, Fatigue Management, Revision 7

Condition Reports
2195832 2203447 2208734 2205649 2204541

Maintenance Orders/Work Orders
40427608

Miscellaneous
RS1737, Form A: Estimated Critical Boron Concentration, Revision 7, dated April 28

Section 1R22: Surveillance Testing

Procedures
CDI-018, Primary-To-Secondary Leak Rate Monitoring Below 1 GPD, Revision 4
EX1804.041, Main Steam Safety Valve In-Place Setpoint Verification, Revision 6
NAP-501-1, Software Classification Determination, Revision 1
OX1413.05, RHR Cold Shutdown Valve Testing, Revision 8
OX1456.81, Operability Testing of IST Valves, Revision 25
OX1456.86, Operability Testing of IST Pumps, Revision 12 and 13
OX1456.92, Centrifugal Charging Comprehensive Pump Test, Revision 10

Condition Reports
2209623

Maintenance Orders/Work Orders
40427634 40453408 40530434

Miscellaneous
9763-006-248-31, UE&C Specification for Steam Generator Safety Valves, Revision 4
UFSAR Section 6.3, Revision 14
UFSAR Table 6.3-5, Revision 8
UFSAR Section 9.3, Revision 14

Drawings
PID-1-CS-B20725, Chemical and Volume Control Charging System Detail, Revision 32

Section 1EP2: Alert and Notification System Evaluation

Procedures
SIR.10, WPS-3000 and WPS-4008 Siren Bi-Weekly Functional Test, Revision 6
SIR.11, WPS-3000 and WPS-4008 Siren Annual Maintenance, Revision 4
SIR.45, State Siren Activation Control System Annual Maintenance and Testing, Revision 6
SIR.76, Local Town Siren Activation Control System Annual Maintenance and Testing, Revision 4

Miscellaneous
Seabrook Station ANS Maintenance and Testing records, December 2015 – April 2017
Seabrook Station Nuclear Power Plant Alert and Notification System Design Report, Addendum 7, June 2013
Seabrook Station Radiological Emergency Plan, Revision 70

Section 1EP3: Emergency Response Organization Staffing and Augmentation System

Procedures
EP-AA-107, Fleet Emergency Response Organization Training Program, Revision 5
GN1332.00, Security Response to a Declared Radiological Emergency, Revision 45

Miscellaneous
2016 1st Quarter Emergency Response Organization Notification Test Results
2016 2nd Quarter Emergency Response Organization Notification Test Results
2016 3rd Quarter Emergency Response Organization Notification Test Results
2016 4th Quarter Emergency Response Organization Notification Test Results
E-Plan Personnel Expiration Report – 14 day look ahead dated May 2, 2017
ERO Staffing Succession Planning, dated March 20, 2017
ERO training records 2016-2017
Weekly ERO Pager Test, and Quarterly ERO Call-In Drill, results, April 2015 – April 2017
Duty Roster week of 5/1/17
Seabrook Station Drill Report CFD 1501
Seabrook Station Radiological Emergency Plan, Revision 70
Seabrook Station On-Shift Staffing Analysis Report, Revision 1

Section 1EP5: Correction of Emergency Preparedness Weaknesses

Procedures
EP-AA-100-1007, Evaluation of the Change to the Emergency Plan, Supporting Documents and Equipment (10CFR 50.54(Q)), Revision 3
ER 5.4, Protective Action Recommendations, Revision 36
LI-AA-102-1001, Regulatory Reporting, Revision 9
LI-AA-102-1001, Regulatory Reporting, Revision 16
SM 7.28, Seabrook Equipment Important to Emergency Response, Revision 4

Condition Reports

02043973	02055605	02062157	02109221	02109221	02109224
02109226	02109262	02109563	02109563	02142436	02202831
02202923	02202937	02203219			

Maintenance Orders/Work Orders

40441823	40410144	40426487

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Procedures
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HD0958.17, Performance of Routine Radiological Surveys, Revision 12
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Procedures
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HD0965.10, Respirator Fit Testing Using the TSI Portacount, Revision 19
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Procedures
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HD0958.49, Response Protocols for Whole Body Counting and Personnel Contamination Monitoring, Revision 9
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Procedures
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Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

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2202358

Miscellaneous
Event Notification Worksheet for EN# 52718 (NRC Form 361)

LIST OF ACRONYMS

AC	alternative current
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
ANS	Alert and Notification System
AOT	allowed outage time
AR	action request
ASME	American Society of Mechanical Engineers
ASME Code	American Society of Mechanical Engineers Boiler and Pressure Vessel Code
ASR	alkali-silica reaction
CAP	corrective action program
CFR	*Code of Federal Regulations*
CR	condition report
CTSW	cooling tower service water
CWT	cooling water tower
CT	cooling tower
EC	engineering change
EDG	emergency diesel generator
EFW	emergency feedwater
EP	emergency preparedness
EPRI	Electric Power Research Institute
ERF	Emergency Response Facility
ERO	Emergency Response Organization
FEMA	Federal Emergency Management Agency
FSEL	Ferguson Structural Engineering Laboratory
GDC	general design criteria

HRA	high radiation area
IMC	Inspection Manual Chapter
IOC	issue of concern
IST	in-service test
ISTS	improved standard technical specifications
LAR	license amendment request
LCO	limiting condition for operability
LHRA	locked high radiation area
MSIV	main steam isolation valve
NDE	non-destructive examination
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NVLAP	National Voluntary Laboratory Accreditation Program
OOS	out of service
OR18	refueling outage 18
PCCW	primary component cooling water
PI	performance indicator
POD	prompt operability determination
PT	penetrant testing
RCS	reactor coolant system
RHR	residual heat removal
RTP	rate thermal reactor power
RVUH	reactor vessel upper head
RWP	radiation work permit
SFDP	safety function determination program
SG	steam generator
SER	safety evaluation report
SMPM	Structures Monitoring Program Manual
SOO	standing operating order
SSC	structure, system, and component
SW	service water
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
UHS	ultimate heat sink
URI	unresolved item
UT	ultrasonic test
VHRA	very high radiation area
WO	work order