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

August 5, 2014

Mr. Dean Curtland
Site Vice President
Seabrook Nuclear Power Plant
NextEra Energy Seabrook, LLC
c/o Mr. Michael Ossing
P.O. Box 300
Seabrook, NH 03874

SUBJECT: SEABROOK STATION, UNIT NO. 1 - NRC INTEGRATED INSPECTION REPORT 05000443/2014003

Dear Mr. Curtland:

On June 30, 2014, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at Seabrook Station, Unit No. 1. The enclosed inspection report documents the inspection results, which were discussed on July 10, 2014, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings did not involve a violation of NRC requirements. Further, inspectors documented a licensee-identified violation, which was determined to be of very low safety significance, in this report. The NRC is treating the finding as a non-cited violation (NCV), consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest the subject or severity of any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Seabrook Station. In addition, if you disagree with the cross-cutting aspect assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Seabrook Station.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Glenn T. Dentel, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000443/2014003
w/ Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-443
License No.:	NPF-86
Report No.:	05000443/2014003
Licensee:	NextEra Energy Seabrook, LLC
Facility:	Seabrook Station, Unit No.1
Location:	Seabrook, New Hampshire 03874
Dates:	April 1, 2014 through June 30, 2014
Inspectors:	P. Cataldo, Senior Resident Inspector C. Newport, Resident Inspector T. O'Hara, Reactor Inspector B. Dionne, Health Physicist
Approved by:	Glenn T. Dentel, Chief Reactor Projects Branch 3 Division of Reactor Projects

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SUMMARY

IR 05000443/2014003; 04/01/2014-06/30/2014; Seabrook Station, Unit No. 1; Maintenance Effectiveness and Follow-up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified two findings of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within Cross-Cutting Areas," dated December 19, 2013. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance (Green) because NextEra did not perform adequate evaluations of safety-related residual heat removal (RHR) vaults. Specifically, additional technical evaluation and analysis was not adequately conducted on the safety-related 'A' and 'B' RHR concrete vaults when it was determined that they exceeded the quantitative limits specified in NextEra procedures. NextEra entered the failure to perform adequate technical evaluations on concrete structures exceeding American Concrete Institute (ACI) Tier II quantitative requirements into the CAP (action request (AR) 01929460), and planned to perform a formal technical evaluation of the 'A' and 'B' RHR vault conditions in accordance with their structural monitoring program procedure and the ACI 349.3R-96 standard.

  The performance deficiency was considered to be more than minor because it affected the protection against external factors attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inspectors concluded that the reliability of the structures was affected in that they exceeded the specified Tier II limits without the performance of further technical evaluations. The issue was evaluated in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and determined to be of very low safety significance (Green) because it did not represent an actual loss of function of at least a single train for greater than its Technical Specification Allowed Outage Time or two separate safety systems out-of-service for greater than it Technical Specification Allowed Outage Time. This finding is related to the cross-cutting area of Human Performance – Procedure Adherence, because NextEra did not follow processes, procedures, and work instructions. Specifically, NextEra personnel did not perform an adequate technical evaluation of two safety-related concrete structures that exceeded the quantitative criteria requiring such an evaluation [H.8]. (Section 1R12)

- Green. The inspectors identified a self-revealing finding of very low safety significance (Green), because NextEra did not ensure that adequate procedural guidance existed in ON1046.12, 'Operation of the Main Generator Breaker' to limit the likelihood of events that upset plant stability. Specifically, Seabrook station experienced an automatic reactor trip from approximately 15 percent reactor power on April 1, 2014 when two of four reactor

coolant pumps (RCPs) tripped on low bus voltage. The cause of the reactor trip was directly attributable to the main generator breaker inadvertently closing and actuating the main generator multi-function protective relay. NextEra entered the event into their CAP, and conducted a root cause evaluation to determine the root and contributing causes, extent of condition and extent of cause, and to identify corrective actions to prevent recurrence. NextEra initiated actions to revise ON1046.12 to add controls regarding the potential risk associated with placing the main generator breaker control in local, conducted briefings with Maintenance groups involved in the event, and evaluated the adequacy of other Operations procedures that place equipment in a configuration where protective features are bypassed or defeated.

The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone, and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was evaluated under IMC 0609, Attachment 4, "Phase 1 – Initial Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because it did not result in both a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The finding has a cross-cutting aspect in the area of Human Performance - Work Management, because NextEra did not ensure that a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority was implemented. Specifically, ON1046.12, "Operation of the Main Generator Breaker" did not contain adequate procedural guidance regarding the impacts of positioning the Main Generator Selector Switch to local, take mitigating actions, and minimize time spent at increased risk configurations [H.5]. (Section 4OA3)

Other Findings

A violation of very low safety significance that was identified by NextEra was reviewed by the inspectors. Corrective actions taken or planned by NextEra have been entered into NextEra's corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Seabrook Unit 1 began the assessment period reducing power to begin a planned refueling outage (OR) 16. However, at 12:26 a.m., on April 1, 2014, an unanticipated reactor trip occurred while the plant was at approximately 15 percent reactor power. Following the reactor trip, Unit 1 remained shutdown until April 24, 2014 when the main unit generator was successfully synchronized with offsite power, and resumed full power operation (100 percent) on April 28, 2014. Seabrook Unit 1 operated at essentially 100 percent power for the remainder of the assessment period. 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 – 3 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of NextEra's readiness for the onset of seasonal high temperatures. The review focused on the service water cooling tower, service water pump house, switchyard, termination yard, and the control building. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TSs), the seasonal readiness memorandum, and the corrective action program to determine specific temperatures or other seasonal weather that 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 (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate 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 communication 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 interviewing the responsible system manager, reviewing condition reports (CRs) and open work orders, and walking down portions of the offsite and AC power systems including the 345 kilovolt (kV) termination yard, the 345 kV switchyard, and the relay room.

b. Findings

No findings were identified.

.3 External Flooding

a. Inspection Scope

During the period of June 16 to June 20, 2014, the inspectors performed an inspection of the external flood protection measures for Seabrook Station. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Chapter 2.4.2.2, which depicts the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors conducted a general site walkdown of the outside area of the site, fuel storage building, the control building, and the emergency diesel generator building to ensure that NextEra erected flood protection measures in accordance with design specifications. The inspectors also reviewed operating procedures for mitigating external flooding during severe weather to determine if NextEra planned or established adequate measures to protect against external flooding events.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Containment penetration return to service on April 17, 2014
- 'A' residual heal removal (RHR) return to service on April 23, 2014
- 'B' emergency feedwater (EFW) pump return to service on June 19, 2014
- 'B' service water return to service on June 26, 2014

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 system performance of their 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 corrective action program (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

On April 17, 2014, the inspectors performed a complete system walkdown of accessible portions of the service water system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, 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 system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and work orders 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 Building C-F-1-Z, C-F-2-Z, & C-F-3-Z on April 7, 2014
- Emergency Feedwater Pump House 27'-0" EFP-F-1-A on May 30, 2014
- Primary Auxiliary Building 53' & 81' PAB-F-3A-Z, PAB-F-3B-Z, PAB-F-4-Z on June 2, 2014

- Site Plan/Hydrant Locations PLT-F-1-0 on June 16, 2014
- Containment Enclosure Ventilation Area, CE-F-1-A on June 23, 2014

.2 Fire Protection – Fire Brigade Response on April 16, 2014 (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed and evaluated control room operator and fire brigade response to fire alarms within containment on April 16, 2014, that involved flames, sparks, and smoke associated with the terminal box for the "A" reactor coolant pump. The inspectors verified that NextEra personnel identified deficiencies and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Communications established between fire brigade and control room
- Propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Procedure adherence regarding fire alarm response, fire brigade dispatch, fire alarm activation, containment evacuation alarm initiation, and assessment of emergency plan actions

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if NextEra identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors also focused on the control building to verify the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers.

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of two samples 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, specifically manholes No. 5 and No. 11, which contain safety-related cables routed to the service water pumphouse from essential switchgear. The inspectors verified water level in the sump/manhole to ensure that the cables were not submerged. The inspectors verified that the bunkers/manholes were dewatered in accordance with station procedures.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the 'B' emergency diesel generator (EDG) jacket water heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified NextEra's commitments to NRC Generic Letter 89-13. The inspectors observed actual performance tests for the heat exchangers and/or reviewed the results of previous inspections of the 'B' EDG jacket water and similar heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that NextEra initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R08 In-service Inspection (71111.08 – 1 sample)

a. Inspection Scope

From April 4 to April 11, 2014 and from April 13 to April 16, 2014, the inspectors conducted a review of NextEra's implementation of in-service inspection (ISI) program activities for Seabrook Unit 1. These activities monitor the reactor coolant system pressure boundary, risk significant piping and components and the containment to identify degradation, complete evaluations and make repairs or replacements as required. Sample selection was based on the inspection procedure objectives and risk priority of those pressure retaining components in systems where degradation could result in a significant increase in risk. The inspectors observed in-process non-destructive examinations (NDE), reviewed documentation records, and interviewed inspection personnel to verify that the non-destructive examination activities performed

as part of Period 2 of the third 10-year interval of the Seabrook ISI Program, during refueling outage OR16, were conducted in accordance with the requirements of the ASME Boiler and Pressure Vessel Code Section XI, 2004 Edition, No Addenda.

Nondestructive Examination (NDE) and Welding Activities

ASME Code-Required Examinations

The inspectors reviewed the equipment calibration sheet and the inspection data sheets from the ultrasonic testing (UT) examination of the pressurizer nozzle inner radius weld (RC E 10 A IR). There were no recordable indications from this examination and 100 percent coverage was achieved.

The inspectors reviewed the equipment calibration sheet and inspection data sheets from the UT examination of the pressurizer nozzle weld (RC E-10 A-NZ). There were no recordable indications from this examination; however coverage was limited to 74 percent due to the nozzle configuration.

The inspectors reviewed the equipment calibration sheet and the inspection data sheets from the UT examination of the Steam Generator (SG) 'A' nozzle to pipe weld (RC E 11A 2B NZ). There were no recordable indications from this examination and 100 percent coverage was achieved.

The inspectors reviewed the equipment calibration sheet and inspection data sheets from the UT examination of the pressurizer nozzle weld (RC E-10 2A-NZ). There were no recordable indications from this examination; however coverage was limited to 98 percent due to the nozzle configuration.

The inspectors reviewed the equipment calibration sheet and the inspection data sheets from the UT examination of the SG 'A' pipe to nozzle weld inner radius (RC E 11 2A-IR). There were no recordable indications from this examination and 100 percent coverage was achieved.

The inspectors reviewed the equipment calibration sheet and the inspection data sheets from the UT examination of the SG 'A' nozzle to pipe weld inner radius (RC E-11A 2B IR). There were no recordable indications from this examination and 98 percent coverage was achieved.

The inspectors reviewed the equipment calibration sheets and the inspection data sheets from the UT examination of the pressurizer nozzle weld (RC E-11 2B-NZ). There were no recordable indications from this examination and 98 percent coverage was achieved.

The inspectors reviewed the inspection data sheet from the bare metal visual examination of the reactor vessel closure head (RVCH) and control rod drive mechanism (CRDM) nozzle penetrations performed in accordance with ASME Code Case 792-1.

The inspectors reviewed certifications of the NDE technicians performing these examinations and verified that the inspections were performed in accordance with approved procedures and that the results were reviewed and evaluated by certified Level III NDE personnel.

Other Containment Liner Examinations

The inspectors reviewed additional UT results completed by NextEra to examine the containment liner. NextEra performed ultrasonic thickness measurements of 51, one-square foot area sample locations of the containment liner. These measurements were taken from the inside of the containment at elevation -26 feet and were spaced approximately every 6 degrees in azimuth around the containment circumference in accessible areas. The containment liner thicknesses were measured to be nominally 0.375 inch in thickness at all locations, and no exterior or interior surface degradation of the liner was evident.

The inspectors reviewed the visual testing (VT) procedures and the recorded inspection results for the inspection of an anomaly on the upper dome portion of the containment liner. The inspectors determined these inspections were conducted in accordance with the ASME Code Section XI, Subsection IWE. An engineering evaluation of the inspection results concluded that no observable change had occurred in the anomaly and recommended re-inspection during the next refueling outage, OR17.

The inspectors reviewed the records of a water intrusion condition in the fuel transfer tube vault which had been identified in 2009. One wall of the fuel transfer tube vault is also part of the containment liner. In April 2011, NextEra staff made an entry into the vault area and conducted an inspection of the liner condition inside the vault. Some areas of the containment liner portion of the fuel tube vault had minor, light rust which was removed. UT measurements of the liner thickness in 2011 verified that all previously rusted areas on the liner were greater than 0.375 inch. Also, NextEra staff made repairs to the non-liner portion of the vault wall which had shown signs of leakage. Because this repair was not on the containment liner portion of the vault, no repair has been made under the ASME Code, Section IWE in the fuel transfer vault. The inspectors determined there were no examinations completed during OR16. An examination was not required because the leak was stopped in 2011 and a repair was not made to the containment liner.

Review of Originally Rejectable Indications Accepted by Evaluation

The inspectors reviewed a volumetric examination data sheet for an indication identified during a previous (OR15) inspection of a piping weld in line SI- 0251-07-09. A flaw evaluation completed by a qualified NDE Level III individual later determined that the flaw was acceptable per ASME Code, Subsection XI, Table IWB-3514-2.

The inspectors reviewed the NDE report of a weld flaw detected in the J-groove weld during the ultrasonic (UT) examination of RVCH penetration No. 57. These inspections are required by 10 CFR 50.55(a) and Code Case N-729-1. NextEra staff performed a manual eddy current (EC) inspection to determine if the indication was fully contained within the weld. The EC exam showed that the indication was completely contained by the weld material and was acceptable per the requirements of the ASME Code without repair.

Repair/Replacement Activities

The inspectors reviewed WO package 40108170-01 for replacement and testing activities of pressure relief valve SI-V-60, the ‘D’ accumulator relief valve. The inspectors verified that the replacement valve was successfully tested with a leak test

pressure of 630.5 psig. The inspectors also reviewed the VT-2 visual examination data sheet for SI-V-60, and the Form A of the Flanged Joint Torque Traveler for the valve. The inspectors also reviewed the Field Work Closeout Form and the ASME Form NIS-2A Repair/Replacement Certification Record. The inspectors determined that the replacement was completed in accordance with ASME Section XI, Repair/Replacement requirements.

The inspectors reviewed WO 40220458-03 associated with the shop fabrication of piping to replace the service water pump P-41 B/D discharge piping with AL6XN piping material per engineering change EC278717. The inspectors reviewed the ASME Section XI Repair/Replacement Plan Traveler, the Form A Weld Traveler, and the liquid penetrant test records to verify that the replacement piping had been fabricated in accordance with the change document. The inspectors verified that the Repair/Replacement Plan had been completed correctly in accordance with the ASME Section XI Code.

PWR Vessel Upper Head Penetration (VUHP) Inspection Activities

The inspectors reviewed the NextEra calculations of Effective Degradation Years (EDY) and Re-inspection Year (RIY) for the Seabrook Unit 1 Reactor Vessel Upper Head completed prior to OR16. Based on these calculation results, NextEra completed an inspection of the Unit 1 VUHP J-groove welds during the OR16 refueling outage. These calculations were performed in accordance with the requirements of 10 CFR 50.55a(g)(6)(ii)(D) and the ASME Boiler and Pressure Vessel Code Case N 729 1, “Alternative Examination Requirements for PWR Reactor Vessel Upper Heads,” to ensure the structural integrity of the reactor vessel head pressure boundary.

The inspectors reviewed visual inspection reports (Data Sheets) of the remote bare metal visual examination of the exterior surface of Unit 1 VUHP to confirm appropriate inspection coverage was achieved and to verify that no boric acid leakage or wastage had occurred.

The inspectors observed the ultrasonic examination of several RVCH penetrations and reviewed the data from the inspection of penetration No. 57 which identified a recordable indication in the J-groove weld. The inspectors reviewed the Eddy Current (ET) inspection data used to verify the location of the indication. This inspection verified that the indication was enclosed within the J-groove weld and could be accepted for continued use without repair. There were no other recordable indications detected in the other reactor vessel upper head nozzle penetrations.

Boric Acid Corrosion Control (BACC) Inspection Activities

The inspectors reviewed the boric acid corrosion control program, which is conducted in accordance with Seabrook Unit 1 Station procedures and NextEra procedures, discussed the program with the boric acid program owner, and sampled photographic inspection records of boric acid leaks found on safety significant piping and components inside the Seabrook Unit 1 containment. The walkdowns were conducted by NextEra personnel and were directly observed by the NRC Resident Inspectors on April 1, 2014, during the initial containment entry for the OR16 outage. The inspectors reviewed a sample of leaks observed and reported, the identification and documentation of non-conforming conditions identified in the corrective action program and reviewed a sample of boric acid evaluations completed by engineering to repair or monitor the conditions.

The inspectors verified that potential deficiencies identified during the walkdowns were entered into NextEra's corrective action program and reviewed a sample of engineering evaluations of the conditions reported to verify that the corrective actions were consistent with the requirements of the NextEra procedures and 10 CFR 50, Appendix B, Criterion XVI.

Steam Generator (SG) Tube Inspection Activities

The inspectors observed a portion of SG eddy current testing (ECT) examinations, data evaluation, and documentation review of the final list of pluggable tubes from this inspection.

The inspectors remotely observed a sample of the Unit 1 SG eddy current tube examinations which were based upon Seabrook's operating experience and the assessment of past degradation mechanisms.

The scope consisted of the following examinations:

- 100 percent bobbin coil probe examination of SG 'B'
- 20 percent bobbin coil probe examination of SG 'A', SG 'C', and SG 'D', including Outside Diameter Stress Corrosion Cracking (ODSCC) susceptible tubes, and tubes susceptible to tube-to-tube wear
- 100 percent +Point examination of dings/dents > 5 volts on HL (including U-Bend) in SG 'C'
- 20 percent +Point examination of dings/dents > 5 volts on HL (including U-bend) in SG 'A', SG 'B', and SG 'D'
- Resolution of all bobbin coil probe "I" codes
- Visual inspection of all plugs (mechanical and welded)
- Visual inspection of channel heads in all SG's

The inspectors reviewed a sample of the indications identified in the SGs during the OR15 eddy current inspections to verify that they were consistent with the potential degradation mechanisms that may be observed during the current OR16 inspections as documented in SG-SGMP-13-21, Revision 3, "Steam Generator Degradation Assessment for the Seabrook OR16 Refueling Outage." The inspectors also reviewed the Condition Monitoring and Operational Assessments from the prior outage, OR15.

The inspectors verified that the SG eddy current tube examinations were performed in accordance with Unit 1 Technical Specifications and the Unit 1 Steam Generator Program by reviewing the SG tube eddy current test results to verify that no in-situ pressure testing was required, no tubes required stabilization, and no increased primary-to-secondary leakage had occurred over the operating cycle.

The inspector also verified that the tubes that exhibited degradation and did not meet acceptance criteria were plugged (3 tubes, due to anti-vibration bar wear) or sleeved (0 tubes) using the alternate repair criteria per Generic Letter 95-05, Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by ODSCC during the OR16 inspection.

The inspectors verified that SG tubes that exhibited degradation examination screening criteria was in accordance with the Electric Power Research Institute (EPRI) Steam Generator Guidelines and flaw sizing was in accordance with EPRI examination technique specification sheet. During OR16, NextEra plugged three tubes in 'C' SG due to anti-vibration bar wear. The total tubes plugged in all four SG's, at the completion of OR16, was 185.

NextEra staff did not conduct foreign object search and retrieval (FOSAR) on the secondary side of the SGs during OR16, because the secondary side of the SG's were not opened and inspected during this outage.

The inspectors reviewed the Westinghouse eddy current testing procedures and verified that NextEra completed the steam generator inspections in accordance with the requirements of NEI 97-06, Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7. The inspectors also reviewed the Westinghouse procedure qualification certifications and a sample of data analysts' personnel certifications. The inspectors reviewed a sample of eddy current qualification records for Primary and Secondary resolution analysts, Independent Quality Data Analysts, and Utility Level III Quality Data Analysts.

Identification and Resolution of Problems

The inspectors reviewed a sample of Seabrook Station Unit 1 condition reports, which identified NDE indications, deficiencies and other non-conforming conditions since the previous OR15 outage and during the current OR16 outage. The inspectors verified that nonconforming conditions were properly identified, characterized, evaluated and entered into the corrective action program.

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on June 25, 2014, which included a loss of coolant accident coincident with a loss of off-site power. 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. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. 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 licensed operator performance in the main control room during plant shutdown in preparation for a planned refueling outage (OR16), and observed operations staff event response to a reactor trip and transition to Mode 3 on April 1, 2014. Additionally, inspectors observed containment fire response on April 16, 2014; initial reactor coolant system (RCS) draindown and heatup activities on April 4 and 21, 2014; approach to criticality and transition to Mode 2 on April 23, 2014; control room turnover on June 10, 2014; and RCS boration and turbine control system reboot on June 12, 2014. The inspectors observed applicable 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 (71111.12 – 2 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 (MR) basis documents to ensure that NextEra was identifying and properly evaluating performance problems within the scope of the MR. For each sample selected, the inspectors verified that the SSC was properly scoped into the MR in accordance with 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 MR system boundaries.

- 4000-RM-10 Snubber failure on April 11, 2014
- Structures monitoring program - RHR vaults on May 23, 2014

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) because NextEra did not perform adequate evaluations of safety-related RHR vaults. Specifically, additional technical evaluation and analysis was not adequately conducted on the safety-related ‘A’ and ‘B’ RHR concrete vaults when it was determined that they exceeded the quantitative limits specified in NextEra procedures.

Description: NextEra's Engineering Department Standard 36180, "Structural Monitoring Program" provides guidance for the conduct of the structural condition monitoring program to meet the requirements of 10CFR 50.65, the Maintenance Rule. The procedure provides a systematic approach for evaluation of plant structures to provide reasonable assurance that those structures are capable of fulfilling their intended safety function. This is accomplished, in part, by periodic reviews of the condition of plant structures via systematic walkdowns. Additionally, NextEra's structural monitoring program commits to the requirements specified in the American Concrete Institute standard ACI 349.3R-96, 'Evaluation of Existing Nuclear Safety Related Concrete Structures' for the evaluation of conditions identified in safety-related concrete structures. This commitment was formally implemented by procedure revision on July 29, 2013.

NextEra's structural monitoring program procedure states that measurable discontinuities exceeding specified ACI 'Tier II' quantitative limits shall be considered unacceptable and in need of further technical evaluation and that further evaluation should consider the use of other inspection, testing or analytical tools to obtain condition and functional information of the structures in question.

While performing a plant walkdown on May 23, 2014, the inspectors identified several instances of concrete conditions in the 'A' and 'B' RHR vaults that exceeded the quantitative Tier II criteria specified in NextEra's procedure. These conditions included: spalling greater than 20 millimeter (mm) in depth, passive cracks greater than 1 mm, and staining of an undefined source on concrete surfaces. The load bearing walls of the RHR vaults are approximately 30 inches thick and are reinforced with number 8 vertical reinforcing bars spaced at 12 inches each face and number 9 horizontal reinforcing bars spaced at 9 inches each face.

The inspectors reviewed NextEra's routine structures monitoring program walkdown evaluations conducted on the 'A' RHR vault on October 10, 2013 and the 'B' RHR vault on March 25, 2014. The inspectors noted that NextEra personnel had identified the conditions, but had not conducted adequate technical evaluation of those conditions. Specifically, NextEra's analysis of the conditions in the RHR vaults relied largely on engineering judgment and did not use any other inspection, testing or analytical tools to obtain additional condition and functional information of the two vaults.

The inspectors consulted with regional specialists, reviewed a subsequent licensee evaluation of the RHR vaults, and concluded that the RHR vaults remain operable and have reasonable assurance of structural integrity. This conclusion is based on the significant reduction in crack width below the concrete cover, and the absence of degradation or distress in the concrete surrounding the cracks. The observed cracks do not show any indications that they are alkali-silica reaction (ASR) related/induced cracks Rather, the cracking is more likely due to shrinkage and/or settlement-induced stress relief. Additional engineering review and analysis is warranted to more clearly identify and understand the cause(s) of the observed cracking in the RHR vaults.

NextEra entered the failure to perform adequate technical evaluations on concrete structures exceeding Tier II quantitative requirements into the Corrective Action Program (AR 01929460), and planned to perform a formal technical evaluation of the 'A' and 'B' RHR vault conditions in accordance with their structural monitoring program procedure and the ACI 349.3R-96 standard.

Analysis: The inspectors determined that NextEra's failure to perform an adequate technical evaluation of conditions identified in the 'A' and 'B' RHR vaults that exceeded the Tier II quantitative criteria in the structures monitoring program procedure was a

performance deficiency within NextEra's ability to foresee and correct. The performance deficiency was considered to be more than minor because it affected the protection against external factors attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inspectors concluded that the reliability of the structures was affected in that they exceeded the specified Tier II limits without the performance of further technical evaluations. The issue was evaluated in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and determined to be of very low safety significance (Green) because it did not represent an actual loss of function of at least a single train for greater than its TS Allowed Outage Time or two separate safety systems out-of-service for greater than its TS Allowed Outage Time. This finding is related to the cross-cutting area of Human Performance – Procedure Adherence, because NextEra did not follow processes, procedures, and work instructions. Specifically, NextEra personnel did not perform an adequate technical evaluation of two safety-related concrete structures that exceeded the quantitative criteria requiring such an evaluation [H.8].

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. **(FIN 05000443/2014003-01, Inadequate Technical Evaluation of Safety-Related Structures)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 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.

- Lowering of reactor water level for reactor vessel head removal on April 3, 2014
- Unit Auxiliary Transformers (UATs) and RHR OOS for maintenance on April 8, 2014
- Mid-loop operations for steam generator nozzle dam removal on April 13, 2014
- Risk assessment for 1-ED-X-2-A/B OOS for main generator breaker repairs while entering Mode 4 from Mode 5, Mode 3 from Mode 4, and Mode 2 from Mode 3 on April 22, 2014
- 'B' containment instrument air compressor corrective maintenance on June 2, 2014
- Battery charger return to service on June 19, 2014

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- 'A' EFW past operability due to oil leak identified on March 19, 2014
- Vital inverter EDE-1B increased DC input amps on May 25, 2014
- RCP undervoltage (UV) time delay relays out of tolerance on June 9, 2014
- Seat leakage on 1-MS-V-393 on June 19, 2014

The inspectors selected these issues based on the risk significance of the associated components and systems. 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. 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. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems. In addition, the inspectors reviewed modification documents associated with the upgrade, including associated engineering changes, correspondence with the vendor, industry operating experience, environmental and seismic qualifications, as well as the 10 CFR 50.59 documentation and post-modification testing results, as applicable.

- Engineering Change 250048, main feed pump turbine digital upgrade

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 ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- CBS-V2 following electrical maintenance on valve motor, on April 1, 2014
- RHR pump 8B comprehensive test following maintenance on April 14, 2014
- Retest for strainer 11 bypass leak on April 15, 2014
- BC-1A energize and parallel following maintenance on May 22, 2014
- CS-FCV-111A actuator diaphragm replacement on June 11, 2014
- 'B' service water train comprehensive test on June 25, 2014

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 (OR16), which was conducted April 1 to 22, 2014. 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 and evaluated the following outage activities:

- Shutdown and cooldown operations, and transition to Mode 5 and entry into RHR operations
- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- 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
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting

- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal (RHR) operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity , including fuel handling and receipt inspections
- Fatigue management
- Tracking of startup prerequisites, including mode transition reviews, walkdown of the primary containment to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Reactor start-up and plant heat-up activities
- Identification and resolution of problems related to refueling outage activities
- Consistent with TI 2515/188: Inspection of Near-Term Task Force Recommendation 2.3 – Seismic Walkdowns, reviewed deferred inspections due to inaccessibility from seismic walkdowns conducted in 2012. These activities were performed on: 4160-volt safety bus No. 6, located in the 'B' essential switchgear room, and 480-volt buses E63 and E64, located in containment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 9 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:

- Reactor vent paths cold shutdown and 18 month surveillance on April 1, 2014
- CBS-V-17 and CBS-V-18 local leakage rate tests on April 6, 2014 (containment isolation valve)
- Containment enclosure emergency exhaust filter system 18 month surveillance on April 9, 2014 (containment isolation valve)
- RC-V-88 and RC-V-89 local leakage rate tests on April 9, 2014
- Phase 'B' CBS and CVI actuation 18 month surveillance on April 10, 2014
- EFW comprehensive flow test on April 23, 2014
- Containment personnel hatch door seal leakage test on May 21, 2014 (inservice testing)
- Primary system sample on June 24, 2014
- RCS steady state leak rate calculation on June 28, 2014 (RCS leakage detection)

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

During April 14 to 17, 2014, the inspectors reviewed NextEra performance in assessing the radiological hazards and exposure control for OR16. The inspectors used the requirements in 10 CFR Part 20 and guidance in Regulatory Guide (RG) 8.38 Control of Access to High and Very High Radiation Areas for Nuclear Plants, TSs, and NextEra procedures required by TSs as criteria for determining compliance.

Radiological Hazard Assessment

The inspectors reviewed the last two radiological surveys from the primary channel heads in the four steam generators and from the reactor cavity. The inspectors evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors selected the following radiologically-significant work activities:

- Steam Generator Eddy Current Testing and Tube Plugging
- Reactor Cavity Work during OR16, Includes Reactor Head Lift/Set
- Replace Reactor Head O-ring

The inspectors evaluated whether continuous air monitors (CAMs) were located in areas that were representative of actual work areas. The inspectors evaluated the NextEra program for monitoring levels of loose surface contamination in areas of the plant.

The inspectors reviewed several radiation work permits (RWP) used to access locked high radiation areas (LHRA) and evaluated if the specified work control instructions and control barriers were consistent with TS requirements for LHRA.

The inspectors observed the Access Control Point location where NextEra monitors material leaving the radiological control area and inspected the methods used for control, survey, and release of these materials. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures. The inspectors assessed whether the radiation monitoring instrumentation used for equipment release and personnel contamination surveys had appropriate sensitivity for the contamination present.

The inspectors evaluated the adequacy of radiological controls, required surveys, radiation protection job coverage, and contamination controls. The inspectors evaluated

NextEra's use of electronic personal dosimeters (EPDs) in high noise areas that were also high radiation areas (HRAs).

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with NextEra procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that NextEra properly implemented an NRC-approved method of determining effective dose equivalent. The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

Instructions to Workers

The inspectors reviewed several RWPs for work within airborne radioactivity areas with the potential for individual worker internal exposures.

For these RWPs, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels. The inspectors assessed applicable containment barrier integrity and the operation of temporary high-efficiency particulate air ventilation systems.

Radiological Hazards Control and Work Coverage

The inspectors discussed with first-line health physics supervisors the controls in place for special areas that have the potential to become very high radiation areas (VHRAs) during certain plant operations. The inspectors assessed whether these plant operations require communication beforehand with the health physics group, so as to allow corresponding timely actions to properly control and monitor the radiation hazards.

Radiation Worker Performance

The inspectors observed the performance of radiation workers with respect to stated radiation protection (RP) work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the RWP controls/limits in place, and whether their behavior reflected the level of radiological hazards present.

RP Technician Proficiency

The inspectors observed the performance of the RP technicians with respect to controlling radiation work. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the RWP controls/limits, and whether their behavior was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed two radiological problem reports since the last inspection that attributed the cause of the event to RP technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by NextEra to resolve the reported problems.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

During April 14 to 17, 2014, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA) for OR16. The inspectors used the requirements in 10 CFR Part 20, RG 8.8 - Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be As Low As Is Reasonably Achievable, RG 8.10 - Operating Philosophy for Maintaining Occupational Radiation Exposure As Low as Is Reasonably Achievable, TSs, and NextEra procedures required by TSs as criteria for determining compliance.

Radiological Work Planning

The inspectors selected the following work activities that had the highest exposure significance.

- Pre-Job ALARA Review 14-02 OR16 Steam Generator Eddy Current Testing and Tube Plugging
- Pre-Job ALARA Review 14-03 OR16 In Service Inspection
- Pre-Job ALARA Review 14-07 OR16 Fuel Handling Project
- Pre-Job ALARA Review 14-09 OR16 RCP Seal Replacement
- Pre-Job ALARA Review 14-10 OR16 Scaffolding
- Pre-Job ALARA Review 14-13 Replace Reactor Ventillation Ducting Under Vessel with New Design

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure reduction requirements. The inspectors determined whether NextEra reasonably grouped the radiological work into work activities, based on historical precedence and industry standards. The inspectors compared the results achieved (actual dose) with the intended dose for these work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups to the RP group actual person-hours for the work activity, and evaluated the accuracy of these time estimates. The inspectors assessed the reasons for any inconsistencies between intended and actual work activity doses.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the assumptions and basis for the collective dose estimates for routine operations and the refueling outage. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and for department and station collective dose goals.

The inspectors evaluated whether the licensee had established measures to track, trend, and to reduce occupational doses for ongoing work activities. The inspectors assessed

whether dose threshold criteria were established to prompt additional ALARA planning and controls.

The inspectors evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors assessed whether adjustments to exposure estimates were based on sound RP and ALARA principles or if they were just adjusted to account for failures to plan/control the work.

Radiation Worker Performance

The inspectors observed radiation worker and RP technician performance during work activities being performed in radiation areas, airborne radioactivity areas, and LHRAs. The inspectors evaluated whether workers demonstrated the ALARA philosophy in practice and whether there were any procedure or RWP compliance issues.

b. Findings

No findings were identified.

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

a. Inspection Scope

During April 14 to 17, 2014, the inspectors verified whether in-plant airborne concentrations were being controlled consistent with ALARA principles and the use of respiratory protection devices on-site did not pose an undue risk to the wearer. The inspectors used the requirements in 10 CFR Part 20, the guidance in RG 8.15 Acceptable Programs for Respiratory Protection, RG 8.25 Air Sampling in the Workplace, NUREG-0041 Manual of Respiratory Protection Against Airborne Radioactive Material, TSs, and NextEra procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the Updated Final Safety Analysis Report to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. This review included instruments used to identify changing airborne radiological conditions. The inspectors reviewed the respiratory protection program and a description of the types of respiratory protection devices used. The inspectors reviewed the procedures for maintenance, inspection, and use of respiratory protection equipment including self-contained breathing apparatus, as well as, procedures for air quality maintenance. The inspectors reviewed reported performance indicators to identify any related to unintended dose resulting from intakes of radioactive material.

Engineering Controls

The inspectors reviewed the licensee's use of permanent and temporary ventilation to determine whether the licensee uses ventilation systems as part of its engineering controls to control airborne radioactivity. The inspectors reviewed procedural guidance

for use of installed plant systems to reduce dose and assessed whether the systems are used during high-risk activities.

The inspectors selected two temporary ventilation system used to support work in contaminated areas. The inspectors assessed whether the use of these systems was consistent with NextEra procedural guidance and ALARA. The inspectors assessed whether the licensee had established threshold criteria for evaluating levels of airborne beta-emitting and alpha-emitting radionuclides.

Use of Respiratory Protection Devices

The inspectors selected two work activities where respiratory protection devices were used to limit the intake of radioactive materials, and assessed whether the licensee performed an engineering evaluation concluding that the use of respirators is not required based on ALARA. The inspectors also evaluated whether the licensee had established means (such as routine bioassay) to determine if the level of protection provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

The inspectors assessed whether respiratory protection devices used to limit the intake of radioactive materials was certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA) or have been approved by the NRC. The inspectors evaluated whether the devices were used consistent with their NIOSH/MSHA certification or NRC approval.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee corrective action program. The inspectors assessed whether the corrective actions were appropriate for a selected sample of problems involving airborne radioactivity and were appropriately documented by the licensee.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

During April 14 to 17, 2014, the inspectors verified that occupational dose is appropriately monitored, assessed and reported by NextEra. The inspectors used the requirements in 10 CFR Part 20, the guidance in RG 8.13 - Instructions Concerning Prenatal Radiation Exposures, RG 8.36 - Radiation Dose to Embryo Fetus, RG 8.40 - Methods for Measuring Effective Dose Equivalent from External Exposure, TSs, and the licensee's procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the results of NextEra RP program audits related to internal and external dosimetry. The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) report on the principal dosimetry used to establish dose of legal record.

A review was conducted of NextEra procedures associated with dosimetry operations, including issuance/use of external dosimetry, and assessments of external and internal dose for radiological incidents. The inspectors evaluated whether NextEra had established procedural requirements for determining when external dosimetry and internal dose assessments are required.

External Dosimetry

The inspectors evaluated whether the NextEra dosimetry vendor is NVLAP accredited and if the approved irradiation test categories for each type of personnel dosimeter used are consistent with the types and energies of the radiation present.

The inspectors evaluated the onsite storage of dosimeters before issuance, during use, and before processing/reading. The inspectors also reviewed the guidance provided to radiation workers with respect to use of dosimeters.

The inspectors assessed the use of EPDs to determine if NextEra uses a “correction factor” to address the response of the EPD as compared to the dosimeter of legal record for situations when the EPD is used to assign dose.

The inspectors reviewed three dosimetry occurrence reports or corrective action program documents for adverse trends related to EPDs. The inspectors assessed whether NextEra had identified any adverse trends and implemented appropriate corrective actions.

Internal Dosimetry

Routine Bioassay (In Vivo)

The inspectors reviewed procedures used to assess the dose from internally deposited radionuclides using whole body count (WBC) equipment. The inspectors evaluated whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, determining the route of intake and the assignment of dose.

The inspectors reviewed the whole body count process to determine if the frequency of measurements was consistent with the biological half-life of the radionuclides available for intake.

The inspectors reviewed NextEra evaluation for use of its portal radiation monitors as a passive monitoring system. The inspectors assessed if instrument minimum detectable activities were adequate to determine the potential for internally deposited radionuclides sufficient to prompt an investigation.

Special Bioassay (In Vitro)

There were no internal dose assessments obtained using In Vitro results for the inspectors to review, i.e., no urinalysis or fecal sample results.

The inspectors reviewed the vendor laboratory quality assurance program and assessed whether the laboratory participated in an industry recognized cross-check program including whether out-of-tolerance results were reviewed, evaluated and resolved appropriately.

Internal Dose Assessment – Airborne Monitoring

NextEra's had not performed any internal dose assessments using airborne/derived air concentration monitoring during the period reviewed.

Special Dosimetric Situations

Declared Pregnant Workers

The inspectors assessed whether NextEra informs workers of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for voluntarily declaring a pregnancy.

The inspectors reviewed the records of one individual who had declared pregnancy during the current assessment period and evaluated whether the NextEra's radiological monitoring program (internal and external) for declared pregnant workers is technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed exposure results and monitoring controls that were implemented for declared pregnant workers during the inspection period.

Dosimeter Placement and Assessment of Effective Dose Equivalent for External Exposures

The inspectors reviewed the NextEra methodology for monitoring external dose in non-uniform radiation fields where large dose gradients exist. The inspectors evaluated the NextEra criteria for determining when alternate monitoring, such as use of multi-badging, is to be implemented. The inspectors reviewed selected dose assessments performed using multi-badging to evaluate whether the assessment was performed consistent with procedures and dosimetric standards.

Shallow Dose Equivalent

The inspectors reviewed one dose assessments for shallow dose equivalent for adequacy. The inspectors evaluated the NextEra method for calculating shallow dose equivalent from distributed skin contamination.

Neutron Dose Assessment

The inspectors evaluated the NextEra's neutron dosimetry program, including dosimeter types and radiation survey instrumentation.

The inspectors reviewed neutron exposure occurrences and assessed whether (a) dosimetry and instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron dosimetry and neutron detection instruments were properly calibrated. The inspectors also assessed whether interference by gamma radiation had been accounted for in the calibration.

Assigning Dose of Record

For the special dosimetric situations reviewed in this section, the inspectors assessed how NextEra assigns dose of record for total effective dose equivalent, shallow dose equivalent, and lens dose equivalent. This included an assessment of external and internal monitoring results, supplementary information on individual exposures, and radiation surveys when dose assignment was based on these techniques.

Problem Identification and Resolution

The inspectors assessed whether problems associated with occupational dose assessment were being identified by NextEra at an appropriate threshold and are properly addressed for resolution in the licensee corrective action program. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving occupational dose assessment.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

During May 19 to 23, 2014, the inspectors reviewed the accuracy and operability of radiation monitoring instruments that are used to protect occupational workers and to protect the public from nuclear power plant operations. The inspectors used the requirements in 10 CFR Part 20, 10 CFR Part 50 Appendix A - Criterion 60 Control of Release of Radioactivity to the Environment and Criterion 64 Monitoring Radioactive Releases, 10 CFR 50 Appendix I Numerical Guides for Design Objectives and Limiting Conditions for Operation to meet the Criterion “As Low as is Reasonably Achievable” for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents, 40 CFR Part 190 Environmental Radiation Protection Standards for Nuclear Power Operations, NUREG 0737 Clarification of Three Mile Island Corrective Action Requirements, TSs/Offsite Dose Calculation Manual (ODCM), applicable industry standards, and NextEra’s procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspector reviewed the Seabrook Station UFSAR to identify radiation instruments associated with monitoring area radiation, airborne radioactivity, process streams, effluents, materials/articles, and workers. Additionally, the inspectors reviewed the associated TS requirements for post-accident monitoring instrumentation. The inspectors reviewed a listing of in-service survey instrumentation including: air

samplers, small article monitors, radiation monitoring instruments, personnel contamination monitors, portal monitors, and whole-body counters. The inspectors assessed whether an adequate number and type of instruments were available to support operations. The inspectors reviewed NextEra and third-party evaluation reports of the radiation monitoring program since the last inspection. The inspectors reviewed procedures that govern instrument source checks and calibrations, including instruments used for monitoring transient high radiological conditions and instruments used for underwater radiation surveys.

Walkdowns and Observations

The inspectors walked down four effluent radiation monitoring systems, including RM6454, Storm Drain Liquid Effluent Monitor; RM6509, Liquid Waste Test Tank Discharge Effluent Monitor; RM6528-1, Plant Vent Wide Range Gas Monitor Effluent Monitor; and RM6526-1, Containment Air Particulate Monitor. The inspectors assessed whether the effluent/process monitor configurations align with what is described in the UFSAR and the ODCM.

The inspectors selected five portable survey instruments in use or available for issuance and assessed calibration and source check stickers for currency, as well as, instrument material condition and operability.

The inspectors observed NextEra staff performance in conducting source checks for the following types of portable survey instruments: MGPI Telepole, Eberline AMP-100 Area Radiation Monitor, Ludlum 44-9 GM Frisker, Eberline RM-14 Pancake Frisker and Eberline RO-2A Ion Chamber. The inspectors assessed whether high-range instruments are source checked on all appropriate scales.

The inspectors walked down five area radiation monitors (ARMs) and four CAMs to determine their adequacy and operability. The inspectors compared the ARM response (via local readout or remote control room indications) with actual area radiological conditions for consistency.

The inspectors selected the Argos 4AB personnel alpha/beta contamination monitor, the GEM-5 gamma portal monitors, the CHRONOS-4 large article monitor, and the SAM-12 small article monitor located at the health physics (HP) Control Point, and evaluated whether the periodic source checks were performed in accordance with the manufacturer's recommendations and NextEra procedures.

Calibration and Testing Program

Process and Effluent Monitors

The inspectors selected three process monitor instruments: RM6532-1, Primary Auxiliary Building (PAB) Air particulate; RM6526-2, Containment Radiogas; and RM6482-1/2, Main Steam Line Monitors and evaluated whether channel calibration and functional tests were performed consistent with Seabrook Station's TSs/ODCM.

The inspectors assessed whether; (a) NextEra calibrated its monitors with National Institute of Standards and Technology (NIST) traceable sources; (b) the primary calibrations adequately represented the plant radionuclide mix; (c) when secondary

calibration sources were used, the sources were verified by comparison with the primary calibration source; and (d) NextEra channel calibrations encompassed the instrument's alarm set-point range.

Laboratory Instrumentation

The inspectors assessed laboratory analytical instruments used for radiological analyses to determine whether daily performance checks and calibration data indicate that the frequency of the calibrations is adequate and there were no indications of degraded performance. The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded performance.

Whole Body Counter (WBC)

The inspectors reviewed calibration records for the WBC and the methods and sources used to perform functional checks on the WBC before daily use and assessed whether calibration and check sources were appropriate and align with the plant's radionuclide mix and that appropriate calibration phantoms were used.

Portal Monitors, Personnel Contamination Monitors, and SAMs

The inspectors selected one of each type of these instruments and verified that the alarm set-point values are reasonable to ensure that licensed material is not released from the site. The inspectors reviewed calibration documentation for each instrument selected and reviewed the calibration methods to determine consistency with the manufacturer's recommendations.

Portable Survey Instruments, ARMs, Electronic Dosimetry, and Air Samplers/CAMs

The inspectors reviewed calibration documentation for the following portable instruments in use: Eberline AMS-4 Continuous Air Monitor, Eberline RO-2A Ion Chamber, Fluke Biomedical 451B Ion Chamber, RADECO HD-29A Air Sampler, MGP AMP 200 Area Monitor Probe and DMC 2000 Electronic Personal Dosimeter (EPD). For portable survey instruments and ARMs, the inspectors reviewed detector measurement geometry and calibration methods and reviewed the use of its instrument calibrator as applicable.

Instrument Calibrator

The inspectors reviewed the current radiation output values for the licensee's portable survey and ARM instrument calibrator units. The inspectors assessed that the licensee had verified calibrator output over the range of the exposure rates/dose rates using an ion chamber/electrometer. The inspectors verified that the measuring devices had been calibrated by a facility using NIST traceable methods and were properly applied by the licensee in performing radiation survey instrument calibrations.

Calibration and Check Sources

The inspectors reviewed the NextEra's waste stream characterization per 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," to assess whether calibration sources used were representative of the types and energies of radiation encountered in the plant.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee corrective action program. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring instrumentation.

b. Inspection Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Reactor Coolant System (RCS) Specific Activity and RCS 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 the period of April 1, 2013 to March 31, 2014. 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 logs of daily measurements of RCS leakage and activity, and compared that information to the data reported by the performance indicator.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 sample)

.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 that 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 condition report screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, “Problem Identification and Resolution,” to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by NextEra outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, MR assessments, and maintenance or CAP backlogs. The inspectors also reviewed NextEra’s CAP database for the first and second quarters of 2014 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 NextEra’s quarterly trend report for the first quarter of 2014, conducted under PI-AA-207-1000, ‘Station Self-Evaluation and Trending, Revision 1, 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.

In general, the inspectors did not identify significant issues with the content and utilization of the station trending report, including any identified adverse trends, potential adverse trends, or management awareness areas. As a result, the inspectors evaluated a sample of departments that are required to provide input into the quarterly trend reports, which included operations, maintenance and engineering departments. This review included a sample of issues and events that occurred over the course of the past two quarters to objectively determine whether issues were appropriately considered or ruled as emerging or adverse trends, and in some cases, verified the appropriate disposition of resolved trends. The inspectors verified that these issues were addressed within the scope of the corrective action program, or through department review and documentation in the quarterly trend report for overall assessment.

For example, the inspectors noted that consistent with the issue identified in Section 4OA3.3, regarding the surveillance test failure, NextEra had identified that a critical warm-up period identified in manufacturer documents was not translated to applicable surveillance procedures. While this was a dated issue from several years ago, this aspect of design interface weaknesses was identified by electrical maintenance following the implementation of a design change for protective relays. However, while not identified specifically as a trend, the issue of appropriately ensuring design interface documents are appropriately revised or updated is being addressed through the corrective action program for the issue referenced later in this report.

Another example identified by the inspectors involved the use of the CAP (versus the trend report) to address trends in the use of the RCS Leak Rate Program. Operations personnel coordinated the use of the CAP and the Training Department to ensure the differences seen in the calculation of identified RCS leak rate were well understood by the control room operators, but required some potential training due to some weaknesses identified in this area.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 - 3 samples)

.1 (Closed) Licensee Event Report (LER) 05000443/2013-001: Failure to Enter Technical Specification Following Discovery of SW Leak

As documented in NRC Inspection Report, 50-443/2013-005, the inspectors dispositioned a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and an associated violation of technical specification (TS) 3.7.4, because NextEra did not follow the requirements of station procedure EN-AA-203-1001, "Operability Determinations/ Functionality Assessments." Specifically, NextEra did not properly evaluate and document an adequate basis for operability, when relevant information was available that would have challenged the "reasonable expectation of operability" threshold for a service water (SW) through-wall leak that degraded incrementally from weepage on August 7, 2013, to a significantly larger leak on August 28, 2013. NextEra completed a temporary non-code repair of the flaw with the installation of a weldolet on September 1, 2013, following NRC review and approval of a relief request. Additionally, during refueling outage OR16, in April 2014, NextEra removed the temporary weldolet and installed a new piping segment to complete the restoration of the section of degraded piping that had developed a leak in August 2013. Extent of condition inspections and liner repairs were also completed for similar piping configurations to the degraded piping segment that were inaccessible during power operation. Moreover, the subject LER was submitted by NextEra when they had concluded, on October 30, 2013, following a review of the actions taken for the SW leak in question, that the plant had operated in a condition prohibited by technical specifications for 24 days, from August 8, 2013 to September 1, 2013. The inspector reviewed several extent of condition inspections, evaluations and repairs, the actual degraded pipe restoration activity (See Section 1R19 for the final acceptance leak test), and verified the adequacy of NextEra's additional corrective actions for the performance issues that contributed to the identified TS violation. These actions included: (1) mentoring of individuals on documentation requirements for prompt operability determinations, (2) procedure revisions to ensure additional barriers are in place for future engineering evaluations regarding field information, assumptions and supervisory reviews, (3) corrective action program requirements were reinforced, and (4) a case study of this service water leak issue was identified to reinforce the relative issues to station personnel.

As a result of this inspection, no additional findings or violations of NRC requirements were identified. This LER is closed.

.2 (Closed) Licensee Event Report (LER) 05000443/2014-001: Reactor Trip Due to Delay in Bus Transfer Resulting in Reactor Coolant Pump (RCP) Loop Low Flow

a. Inspection Scope

On April 1, 2014, at 00:26 while operating at approximately 15 percent power following turbine shutdown and removal of the main generator from service, Seabrook station experienced an automatic reactor trip on reactor coolant two loop loss of flow. The loss of flow was the result of the unexpected closure of the main generator breaker (MGB) 'B' phase which caused the 345kV Bus 6 to de-energize and isolate the MGB. All buses transferred to the reserve auxiliary transformers as designed; however, a slight delay in the automatic transfer for bus 1 resulted in two RCPs tripping. The RCPs tripping resulted in an automatic reactor trip due to reactor coolant loop low flow. The emergency feedwater system actuated on low steam generator level, and all plant equipment functioned as expected. NextEra personnel completed a root cause evaluation to determine the cause of the reactor trip. Corrective actions include: revising procedures to add controls regarding the potential risk, ensure the use of guarded equipment controls, and minimizing the time spent with the main generator breaker in local.

The inspectors reviewed LER 2014-001-00 and associated corrective actions and identified a performance deficiency that was characterized as more than minor and is documented below. This LER is closed.

b. Findings

Introduction. The inspectors identified a Green self-revealing finding, because NextEra did not ensure that adequate procedural guidance existed in ON1046.12, "Operation of the Main Generator Breaker" to limit the likelihood of events that upset plant stability. Specifically, Seabrook station experienced an automatic reactor trip from approximately 15 percent reactor power on April 1, 2014 when two of four reactor coolant pumps (RCPs) tripped on low bus voltage. The cause of the reactor trip was directly attributable to the main generator breaker inadvertently closing and actuating the main generator multi-function protective relay.

Description. At midnight on April 1, 2014, with reactor power at approximately 15 percent, the station turbine generator was shutdown and the main generator breaker was opened in preparation for the start of a scheduled refueling outage. The Main Generator Breaker Selector Switch was subsequently aligned to local in preparation for scheduled main turbine overspeed testing. At 12:26 a.m., the main generator breaker 'B' phase unexpectedly closed, actuating the main generator multi-function protective relay. As a result of the protective relay actuation, 13.8kV buses 1, 2, 3, 4, 5, and 6 automatically transferred from the UATs to the Reserve Auxiliary Transformers (RATs). However, buses 1 and 5 experienced a delayed transfer from the UATs to the RATs based on residual bus voltage, and the two RCPs powered from buses 1 and 5 tripped on low bus voltage as designed. The delayed transfer of buses 1 and 5 was due to a combination of the delay introduced by the 'B' pole remaining closed and initiating an out of synchronization condition, and the more restrictive dead band reset of the newer style synchronization check relays that were installed on buses 1 and 5. The subsequent loss of reactor coolant flow caused an automatic reactor protection system (RPS) actuation and reactor trip on loop low flow.

NextEra determined that the cause of the 'B' main generator breaker pole unexpected closure was from the combination of an air leak from a stuck open pressure reducer valve in the main generator 'B' pole control cabinet, and inadvertent contact with the 'B' pole local closure push button inside the 'B' pole control cabinet during an investigation of the air leak by an operator. NextEra determined that the root cause for the event was inadequate procedural guidance contained in ON1046.12, "Operation of the Main

Generator Breaker" to communicate the impacts of positioning the Main Generator Selector Switch to local, take mitigating actions, and minimize time spent at increased risk configurations. Specifically, ON1046.12 contained no cautions, notes or prerequisites to ensure that licensee personnel were aware of the potential risk associated with the Main Generator Selector Switch being placed in local. Specifically, with the switch in local, the main generator breaker pole disagreement protective features that would have auto-opened the pole upon inadvertent closure were disabled. As a result of the lack of procedural information, licensee personnel did not implement controls in accordance with OP-AA-102-1003, "Guarded Equipment," or take measures to minimize the time spent in the risk significant configuration. NextEra noted that procedures used for controlling similar evolutions contain additional cautions and notes that identify the increased risk configuration.

NextEra entered the event into their CAP (AR 01953543), and conducted a root cause evaluation to determine the root and contributing causes, extent of condition and extent of cause, and to identify corrective actions to prevent recurrence. NextEra initiated actions to revise ON1046.12 to add controls to communicate the potential risk associated with placing the main generator breaker control in local, conducted briefings with Maintenance groups involved in the event, and evaluated the adequacy of other Operations procedures that place equipment in a configuration where protective features are bypassed or defeated. The inspectors reviewed the root cause evaluation and associated documentation, and determined that NextEra adequately identified the root and contributing causes and implemented appropriate corrective actions to prevent recurrence.

Analysis. The inspectors determined that the inadequate procedural guidance contained in ON1046.12, "Operation of the Main Generator Breaker" was a performance deficiency that was within NextEra's ability to foresee and correct. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone, and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was evaluated under IMC 0609, Attachment 4, "Phase 1 – Initial Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because it did not result both in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The finding has a cross-cutting aspect in the area of Human Performance - Work Management, because NextEra did not ensure that a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority was implemented (H.5). Specifically, ON1046.12, "Operation of the Main Generator Breaker" did not contain adequate procedural guidance regarding the impacts of positioning the Main Generator Selector Switch to local, take mitigating actions, and minimize time spent at increased risk configurations [H.5].

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. **(FIN 05000443/2014003-02, Unexpected Main Generator Breaker Pole Closure Results in Reactor Trip)**

.3 (Closed) Licensee Event Report (LER) 05000443/2014-002: Reactor Coolant Pump Undervoltage Time Delay Relay Exceeds Acceptance

On April 6, 2014, during a refueling outage, routine RPS surveillance testing identified that three of four reactor coolant pump (RCP) undervoltage (UV) reactor trip channels exceeded the TS channel response time acceptance criteria of 1.5 seconds for the RCP UV reactor trip function. NextEra determined that since this condition involved multiple similar components, there is evidence indicating that this condition may have arisen over time and three channels of RCP UV were concurrently inoperable. This resulted in the plant operating in a condition prohibited by TSs for approximately seventeen months. NextEra personnel initiated a root cause evaluation to determine the cause of the violation and determine appropriate corrective actions, replaced one relay, and adjusted the remaining relays to acceptable response times.

The inspectors reviewed LER 2014-002-00 and associated corrective actions and dispositioned the issue as a licensee identified violation of regulatory requirements. The enforcement aspects of this issue are discussed in Section 4OA7. This LER is closed.

4OA6 Meetings, Including Exit

On July 10, 2014, the inspectors presented the inspection results to Mr. Dean Curtland, 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.

4OA7 Licensee-Identified Violation

The following violation of very low safety significance (Green) was identified by NextEra and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

- Technical Specification (TS) Surveillance Requirement 4.3.1.2 requires verification of the response time of each reactor trip function every 18 months. During the 18 month surveillance testing of the RCP UV channels conducted on April 6, 2014, three of the four RCP UV relays exceeded their allowable maximum response time, resulting in their associated UV reactor trip channels exceeding the limit of 1.5 seconds. NextEra determined that the three channels were inoperable. TS 3.3.1, 'Reactor Trip System Instrumentation', requires four channels of RCP UV instrumentation to be operable in Mode 1. With three RCP UV channels inoperable in Mode 1, the plant is required to initiate a shutdown within one hour in accordance with TS 3.0.3. NextEra determined that this condition existed from the time the relays were last calibrated in OR15 (September 20, 2012) until the plant entered OR16 (April 1, 2014). Contrary to TS 3.0.3, Seabrook station operated in Mode 1 with three of four RCP UV channels inoperable for approximately 17 months without taking the required TS actions. NextEra entered this issue into the CAP as AR 01964167 and performed a detailed analysis of the impact of the increased channel

response time. NextEra, in consultation with Westinghouse, determined that the safety function of the RCP UV trip channel (prevention of departure from nucleate boiling) was maintained throughout the period of inoperability. NextEra planned to develop a maintenance procedure to allow for on-line re-calibration of the RCP

UV relays. The inspectors determined that the finding was of very low safety significance (Green) in accordance with IMC 0609, Appendix A, “Determining the Significance of Reactor Inspection Findings for At-Power Situations” because the deficiency did not affect a single RPS trip signal to initiate a reactor scram and the function of other redundant trips or diverse methods of reactor shutdown, did not involve control manipulations that unintentionally added positive reactivity, and did not result in a mismanagement of reactivity by operators.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
D. Curtland, Site Vice President
T. Vehec, Site Director
R. Dodds, Plant General Manager
J. Berg, Chemistry Supervisor
K. Boehl, Radiation Protection Supervisor
V. Brown, Senior Licensing Engineer
R. Campion, Oversight Supervisor
A. Chesno, Performance Improvement and Licensing
M. Collins, Engineering Director
J. Connolly, Engineering Director
K. Douglas, Maintenance Director
D. Egonis, Repairs and Welding Services
M. Feeney, Instrumentation and Controls Dept. Head
D. Flahardy, Radiation Protection Manager
S. Hamel, Engineering Support
Z. Kuljis, WesDyne International, EC Level III
R. Leider, Engineer
B. McAllister, Nuclear Engineer
M. Ossing, Licensing Manager
D. Perkins, Radiation Protection Analyst
D. Robinson, Chemistry Manager
D, Snyder, Boric Acid Corrosion Control Program Manager
T. Vassallo, Engineering
T. Waechter, Project Manager
B. Westovic, WesDyne International, Waltz Mill Facility
K. Whitney, ISI Program Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000443/2014003-01	FIN	Inadequate Technical Evaluation of Safety-Related Structures (Section 1R12)
05000443/2014003-02	FIN	Unexpected Main Generator Breaker Pole Closure Results in Reactor Trip (Section 4OA3.2)

Opened

None

Closed

05000443/2013-001-00	LER	Failure to Enter Technical Specification Following Discovery of SW Leak (Section 4OA3.1)

05000443/2014-001-00	LER	Automatic Reactor Trip Due to Delay in Automatic Bus Transfer Resulting in RCP Loop Low Flow (Section 4OA3.2)
05000443/2014-002-00	LER	Reactor Coolant Pump Undervoltage Time Delay Relay Exceeds Acceptance (Section 4OA3.3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

ON1090.13, Response to Natural Phenomena Affecting Plant Operations, Revision 1
ON1246.03, GSU Trouble, Revision 5
OP-AA-102-1002, Seasonal Readiness, Revision 3
OS1200.03, Severe Weather Conditions, Revision 2

Condition Reports

01932588 01962633 01964824 01964840 01967006 01968990
01969460 01969599 01970614

Maintenance Orders/Work Orders

40268452 40244709

Miscellaneous

ISO New England Operating Procedure No. 4, 'Action During a Capacity Deficiency', Revision 12
Master/Local Control Center Procedure No. 1, 'Nuclear Plant Transmission Operations', Revision 13
Master/Local Control Center Procedure No. 2, 'Abnormal Conditions Alert', Revision 17.1
Seasonal Readiness Memo to Mano Nazar dated 5/24/14
UFSAR Chapter 2
UFSAR Section 8

Section 1R04: Equipment Alignment

Procedures

OS1001.01, Reactor Coolant System Fill and Vent, Revision 25
OS1013.03, Residual Heat Removal Train A Startup and Operation, Revision 27
OS1016.01, Service Water System Fill and Vent, Revision 18
OS1036.01, Aligning the Emergency Feedwater System for Automatic Initiation, Revision 17
OS1056.03, Containment Penetrations, Revision 10
OS1090.05, Component Configuration Control, Revision 57

Condition Reports

00207129 00208974 00208987 01843745 01918488 01955956
01956317 01960210

Miscellaneous
Seabrook Station Updated Final Safety Analysis Report, Chapter 9, Revision 12

Section 1R05: Fire Protection
Condition Reports
01803431 01967187 01969430 1958635 1958639

Miscellaneous
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, CE-F-1-A
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, C-F-1-Z, C-F-2-Z, & C-F-3-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, EFP-F-1-A
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, PAB-F-3A-Z, PAB-F-3B-Z, & PAB-F-4-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, PLT-F-1-0

Procedures
OS1200.00, Response to Fire or Fire Alarm Actuation, Revision 21
FP-AA-104, Fire Protection Program, Revision 0

Section 1R06: Flood Protection Measures
Condition Reports
01969726

Miscellaneous
Seabrook Station Moderate Energy Line Break Study
Seabrook Station UFSAR, Revision 15, Section 3 & Section 9

Maintenance Orders/Work Orders
40209732-06 40209732-07 40277675-01 40241371-01

Drawings
9763-F-310248
9763-F-310249

Section 1R07: Heat Sink Procedures
Procedures
ES1850.017, SW Heat Exchanger Program, Revision 1
PEG-268, Heat Exchanger and NRC GL 89-13 Program, Revision 0

Condition Reports
01809068 01957744 01958294 01959163

Maintenance Orders/Work Orders
40262651

Miscellaneous
Calculation C-S-1-25115, DG Heat Exchanger (DG-E-42A/B) Performance After Tube Plugging, Revision 0

Section 1R08: In-service Inspection

Procedures

Engineering Department Instructions, EDI N0. 30560, Boric Acid Evaluations, Revision 1
NextEra Energy Program Description ER-AP-121, Steam Generator Integrity, Revision 0
Seabrook Station, Engineering Procedure, Reactor Vessel Head Penetration Ultrasonic Examination Analysis, ES13-01-08, Revision 00
Seabrook Station, Engineering Procedure, Procedure for Ultrasonic Examination of Reactor Vessel Head Penetrations, ES13-01-07, Revision 00
Seabrook Station, Engineering Procedure, RPVH Nozzle Bottom OD Surface Eddy Current Inspection, ES-01-01, Revision 00
Seabrook Station, Engineering Procedure, Perform VE of RPV Top Head At Penetration 57, Unit 1, 4/11/14
Seabrook Station, Engineering Procedure, Eddy Current Inspection of Preservice and Inservice Heat Exchanger Tubing, ES01-100, Revision 07
Seabrook Station, Procedure, Steam Generator Eddy Current Data Analysis Guidelines Manual, Revision 7
Seabrook Station Administrative Procedure, Boric Acid Corrosion Control Program MA 10.3, Revision 12
Seabrook Station Engineering Procedure, Manual Ultrasonic Procedure for the Examination of Non-PDI Nozzle Inner Corner Regions, ES10-01-38, Revision 01
Seabrook Station Engineering Procedure, Manual Ultrasonic Procedure for the Examination of Non-RPV Nozzle-to-Shell Welds in Vessels >2", ES10-01-39, Revision 01
Seabrook Station Reference Manual, Steam Generator Maintenance Reference, SGRE, Revision 20
Westinghouse Procedure Number MRS-2.4.2 GEN 35, Revision 15, 8/11/11; Eddy Current Inspection of Preservice and Inservice Heat Exchange Tubing
Westinghouse SG-SGMP-12-15, Revision 1, Seabrook OR15, Condition Monitoring Assessment and Final Operational Assessment, January 2013
Westinghouse SG-SGMP-13-21, Revision 3, Steam Generator Degradation Assessment for Seabrook OR16 Refueling Outage, March 2014

Program Documents

EPRI Report 1000975, November 2001; Boric Acid Corrosion Guidebook, Revision 1; Managing Boric Acid Corrosion Issues at PWR Power Stations
NEI 03-08, January 2010; Guidelines for the Management of Materials Issues, Revision 2
NEI 97-06, Pressurized Water Reactor Steam Generator Examination Guidelines, Requirements 1013706, Revision 7
Seabrook Station Reference Manual, Inservice Inspection, SIIR Revision 16, 12/23/13
WCAP-15988, Revision 1, February 2005; Generic Guidance for an Effective Boric Acid Inspection Program for Pressurized Water Reactors
Westinghouse Non-Proprietary Class 3, SG-SGMP-09-22, Revision 2; Seabrook OR13 Condition Monitoring Assessment and Final Operational Assessment, March 2010
Westinghouse Owner's Group Letter WOG 05-91, dated March 15, 2005; Subject: Transmittal of the Final Non-Proprietary Version of WCAP-15988-NP, Revision 1 Entitled "Generic Guidance for an Effective Boric Acid Inspection Program for Pressurized Water Reactors", February 2005, PA-MSC-0096
Westinghouse Seabrook OR14 Condition Monitoring and Operational Assessment, SG-SGMP-11-14, Revision 0; April 2011

Westinghouse Seabrook OR16 Condition Monitoring Assessment and Final Operational Assessment, SG-SGMP-14-10, Revision 0, April 2014
Westinghouse Steam Generator Degradation Assessment for Seabrook OR15 Refueling Outage, SG-SGMP-12-8, Revision 0, September 2012
Westinghouse Steam Generator Degradation Assessment for Seabrook OR15 Refueling Outage, SG-SGMP-12-8, Revision 1, September 2012

Program Health Reports
Boric Acid Corrosion Control Program, 7/1/2013 – 9/30/2013
Boric Acid Corrosion Control Program, 10/1/2013 – 12/31/2013

Eddy Current Examination Technique Sheets
Eddy Current Examination Technique Sheet, ETSS #96004.1, Revision 13, April 2010
Eddy Current Examination Technique Sheet, ETSS #96004.3, Revision 13, April 2010
Eddy Current Examination Technique Sheet, ETSS #96005.2, Revision 9, July 2006
Eddy Current Examination Technique Sheet, ETSS #24013.1, Revision 2, August 2006
Eddy Current Examination Technique Sheet, ETSS #10013.1, Revision 1, May 2012
Eddy Current Examination Technique Sheet, ETSS #128411, Revision 3, February 2011
Eddy Current Examination Technique Sheet, ETSS #128413, Revision 3, February 2011
Eddy Current Examination Technique Sheet, ETSS #27091.2, Revision 1, September 2012
Eddy Current Examination Technique Sheet, ETSS #21409.1, Revision 7, May 2010
Eddy Current Examination Technique Sheet, ETSS #21998.1, Revision 4, August 2006
Eddy Current Examination Technique Sheet, ETSS #128424, Revision 3, February 2011
Eddy Current Examination Technique Sheet, Appendix 1, ETSS #124425, Revision 3, February 2011
Eddy Current Examination Technique Sheet, Appendix 1, ETSS #128431, Revision 2, February 2011
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Eddy Current Examination Technique Sheet, ETSS #21410.1, Revision 6, October 2006
Eddy Current Examination Technique Sheet, ETSS #22401.1, Revision 4, August 2006
Eddy Current Examination Technique Sheet, ETSS #96511.1, Revision 16, August 2006
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LIST OF ACRONYMS

AC	alternating current
ACI	American Concrete Institute
ADAMS	Agencywide Document Access and Management System
ALARA	as low as reasonably achievable
AR	action request
ARM	area radiation monitor
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control Program
CAM	continuous air monitor
CAP	corrective action program
CFR	*Code of Federal Regulations*
CR	condition report
CRDM	control rod drive mechanism
EC	eddy current
ECT	eddy current testing
EDG	emergency diesel generator
EDY	effective degradation years
EFW	emergency feedwater
EPD	electronic personal dosimeter
EPRI	Electric Power Research institute
HRA	high radiation area
IMC	Inspection Manual Chapter
kV	kilovolt
LER	licensee event report
LHRA	locked high radiation area
MR	maintenance rule
MSHA	Mine Safety and Health Administration
NCV	non-cited violation
NDE	nondestructive examination
NEI	Nuclear Energy Institute
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
ODCM	offsite dose calculation manual
ODSCC	Outside Diameter Stress Corrosion Cracking
OOS	out of service
OR	Refueling Outage
PCCW	primary component cooling water
PAB	primary auxiliary building

RAT	reserve auxiliary transformer
RCP	reactor coolant pump
RCS	reactor coolant system
REMP	radiological environmental monitoring program
RG	Regulatory Guide
RHR	residual heat removal
RIY	re-inspection year
RP	radiation protection
RPS	reactor protection system
RVCH	reactor vessel upper closure head
RWP	radiation work permit
SG	steam generator
SSC	structure, system, or component
SW	service water
TS	technical specification
UAT	unit auxiliary transformer
UFSAR	Updated Final Safety Analysis Report
UT	ultrasonic testing
VHRA	very high radiation area
VT	visual examination
VUHP	vessel upper head penetration
WBC	whole body count
WO	work order