



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

August 5, 2016

Mr. Eric McCartney  
Site Vice President  
Seabrook Nuclear Power Plant  
NextEra Energy Seabrook, LLC  
c/o Mr. Ken Browne  
P.O. Box 300  
Seabrook, NH 03874

**SUBJECT: SEABROOK STATION, UNIT NO. 1 – INTEGRATED INSPECTION REPORT  
05000443/2016002**

Dear Mr. McCartney:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Seabrook Station, Unit No. 1 (Seabrook). The enclosed report documents the inspection results, which were discussed on July 20, 2016, with you and other members of your staff.

NRC Inspectors 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.

The inspectors documented two findings of very low safety significance (Green) in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy. If you contest the non-cited violations 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. In addition, if you disagree with the cross-cutting aspect assigned to any finding, or a finding not associated with a regulatory requirement 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.

E. McCartney

-2-

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "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 and 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/*

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

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

Enclosure:  
Inspection Report 05000443/2016002  
w/Attachment: Supplementary Information

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**/RA/**

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

Docket No.: 50-443

License No.: NPF-86

Report No.: 05000443/2016002

Licensee: NextEra Energy Seabrook, LLC

Facility: Seabrook Station, Unit No.1

Location: Seabrook, New Hampshire 03874

Dates: April 1, 2016 through June 30, 2016

Inspectors: P. Cataldo, Senior Resident Inspector  
C. Newport, Resident Inspector  
J. Vazquez, Resident Inspector (Acting)  
B. Dionne, Health Physicist  
W. Cook, Senior Reactor Analyst

Approved by: Fred L. Bower, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

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## SUMMARY

IR 05000443/2016002; 04/01/16-06/30/2016; Seabrook Station, Unit No. 1; Other Activities

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), which were classified as NCVs. 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 April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. 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: Initiating Events

- Green. A self-revealing Green NCV of 10 CFR, Appendix B, Criterion V, "Instructions Procedures, and Drawings," was identified, because NextEra did not ensure that activities affecting quality were accomplished in accordance with documented instructions. Specifically, while implementing a procedure following a plant trip that occurred on March 2, 2016, NextEra staff performed steps of a procedure in a manner that was prohibited by a departmental instruction, leading to an automatic initiation of emergency feedwater (EFW) to maintain adequate steam generator (SG) level. NextEra entered this issue into their corrective action program (CAP) and subsequently initiated a root cause evaluation to determine the factors which contributed to the event. Additionally, NextEra took corrective actions (C/As) to provide additional training and guidance for their staff and to resolve issues with existing procedures, which were determined to have been contributing factors during the event.

The inspectors determined that this performance deficiency was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone, and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability (loss of FW) and challenge critical safety functions during shutdown as well as power operations. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because the performance deficiency did not cause the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Challenge the Unknown, because NextEra did not ensure that individuals stopped when faced with uncertain conditions. Specifically, the individuals involved did not adequately challenge the basis for a decision to disregard a department instruction. [H.11] (Section 4OA3)

- Green. A self-revealing Green NCV of 10 CFR, Appendix B, Criterion V, "Instructions Procedures, and Drawings," was identified because NextEra did not ensure that activities affecting quality were prescribed by documented procedures of a type appropriate to the circumstances and that these activities were accomplished in accordance with these procedures. Specifically, a procedure associated with the testing of safety-related containment isolation functions did not contain sufficient instruction to ensure proper control

of plant configuration; thus implementation of this procedure resulted in an inadvertent letdown isolation. Additionally, while attempting to perform this test on a subsequent occasion, individuals performed additional steps not prescribed in the associated procedure; the execution of these additional steps resulted in an additional inadvertent letdown isolation. NextEra entered these issues into their CAP and subsequently performed apparent cause evaluations for the two events, made necessary changes to the associated procedure, and provided coaching to NextEra staff.

The inspectors determined that this performance deficiency was more than minor because it was associated with the Procedure Quality and Human Performance attributes of the Initiating Events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability (letdown isolation) during power operations. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because the performance deficiency did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Procedural Adherence, because NextEra failed to ensure that individuals followed processes and procedures appropriately. [H.8] (Section 4OA3)

## REPORT DETAILS

### Summary of Plant Status

Seabrook operated at full power for the entire assessment period, with the exception of minor down powers to perform scheduled turbine valve testing.

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 reviewed NextEra's readiness for the onset of seasonal high temperatures. The review focused on the EFW building, electrical tunnels, and the cooling tower (CT). The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TSs), control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure NextEra personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including NextEra's seasonal weather preparation procedure, applicable operating procedures, and the summer readiness activities tracked through completion in the work management system. 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 reviewed 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 communications protocols between the transmission system operator and NextEra. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether NextEra established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing NextEra staff, as applicable, as well as reviewing condition reports (CRs), open work orders (WOs), and system health records, and walked down portions of the offsite and



AC power systems including the termination yard, onsite switchyard, and the high yard containing various distribution breakers.

b. Findings

No findings were identified.

.3 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed NextEra's preparations and actions following a solar magnetic disturbance event that occurred between June 8 to 9, 2016, with an associated global geomagnetic storm index (Kp index) of 7, which required entry into the abnormal operating procedure (AOP) ON1246.03, "GSU Trouble," Revision 10. The inspectors reviewed the implementation of the AOP, as well as other applicable procedures. The inspectors walked down the emergency diesel generators (EDGs) and the onsite switchyard to ensure system availability, and reviewed the generator stepup (GSU) ground induced currents monitored by control room operators. The inspectors verified that operator actions defined in NextEra's procedures maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 'B' residual heat removal (RHR) during 'A' RHR maintenance on April 12
- 'B' charging pump during 'A' charging pump maintenance on June 17
- 'B' vital DC battery distribution during 'A' vital battery testing on June 24
- 'A' EDG during 'B' EDG monthly run on June 28

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, WOs, CRs, and the impact of ongoing work activities on redundant trains of equipment to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether NextEra staff had properly identified equipment

issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

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

a. Inspection Scope

During May 2016, the inspectors performed a complete system walkdown of accessible portions of the EFW system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, system diagrams, equipment line-up check-off lists, WOs, work requests, CRs, TSs, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify 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. The inspectors also reviewed whether NextEra staff had appropriately evaluated and resolved any equipment issues and other performance deficiencies and entered them into their CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

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, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Non-essential switchgear (NES-F-1A-Z) on May 27
- Primary auxiliary building (PAB) (PAB-F-1C-A, PAB-F-1D-A, PAB-F-1E-A, PAB-F-1F-Z) on June 20
- Turbine building (TB-F-3-0, TB-F-2-Z) on June 22

- 'B' RHR vault (RHR-F-1A-1C, RHR-F-1A-2A, RHR-F-1A-3A, RHR-F-4A-Z) on June 27
- Turbine building (TB-F-1B-A, TB-F-1C-Z) on June 29

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 identify internal flooding susceptibilities for the site. The inspectors focused on the RHR vaults to verify the adequacy of equipment seals located below the flood line, flood and water penetration seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. 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.

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 underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes W5 and W6, on June 17, 2016, which contained safety-related cables for various motor control centers and the service water (SW) system. The inspectors verified that the cables were not submerged in water, that cables appeared intact, and to observe the condition of cable support structures. The inspectors verified that NextEra removed identified water following initial opening, and implemented appropriate C/As for issues that were identified.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the 'B' EDG jacket water heat exchanger 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,

“Service Water System Requirements Affecting Safety-Related Equipment.” The inspectors observed maintenance activities, which included tube replacement, and reviewed the results of previous inspections of this heat exchanger. The inspectors discussed the results of the most recent inspection with applicable NextEra staff and observed the as-found and as-left conditions. The inspectors verified that NextEra initiated appropriate C/As 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.

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

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on May 16, 2016, which included simulated equipment failures, and other transients resulting in a faulted SG event. 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 identification of the appropriate TS action statements applicable for the simulated activities. Additionally, the inspectors assessed the ability of the Operations crew to self-identify issues, as well as the 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 SG pressure channel 1 analog channel operability test on April 11, and during ‘B’ EDG post maintenance testing on May 2 and 4. Additionally, on April 13, inspectors observed dynamic stroke testing and complex troubleshooting of CC-V-145; and operator response to a letdown isolation even on June 3. 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 (71111.12Q – 1 sample)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 were reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and C/As to return these SSCs to (a)(2). Where applicable, the inspectors performed a quality control review of commercial grade dedications for items that are purchased commercial grade, and tested accordingly prior to installation into systems important to safety. Additionally, the inspectors ensured that NextEra staff was identifying and addressing common cause failures that occurred within and across MR system boundaries.

- Commercial grade dedication of metal braided hose for CS-P-2A on June 18 (Quality Control Sample)

b. Findings

No findings were identified.

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.

- Switchyard breaker No. 52 maintenance and SW maintenance on April 7
- 'A' primary component cooling water to RHR heat exchanger valve maintenance on April 12
- Scaffolding assembly during 'B' EDG maintenance preparations on April 22
- 'B' EDG maintenance and electric power sequencer testing on April 28

- 'A' EDG maintenance and guarded equipment verification on May 16
- 'A' station service vital battery cross-tie and service testing on June 14

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 based on the risk significance of the associated components and systems:

- Gaps beneath missile barrier on SW pumphouse on March 28
- 'A' EDG fuel oil leak on April 14
- Seismic isolation gaps in containment enclosure building (CEB) annulus on May 3
- Main steam line loop 1 radiation monitoring failure on June 7

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

b. Findings and Observations

No findings were identified.

The inspectors reviewed CR 2129621, "Seismic Isolation Gap Between Containment and CEB is Less Than Specified Value." The CEB surrounds the containment and includes several cantilevered horizontal shield blocks that span the annulus region between the CEB and the containment. By design, there is a nominal 3-inch gap between the containment and the CEB shields to provide seismic isolation between the two structures. NextEra identified during field measurements of the CEB (to refine their finite element analysis model) that the gap appeared to have closed in some locations. As a result, a prompt operability determination (POD) for the reduced seismic isolation gap was completed. The POD addresses the potential impact of a loss of seismic isolation on structural integrity and seismic response between the CEB and containment. NextEra's engineering analysis, as documented in the POD, conservatively assumed that the gap had closed to zero along the entire length of the one affected horizontal shield block. The analysis concluded that (1) the reduced gap would not have an impact on the structural integrity of the CEB or the containment; and (2) due to the higher stiffness of the containment the reduced gap would have a negligible impact on either structures' seismic response. The POD concluded that the structures have adequate

margin and capacity to continue to perform their intended function, and that they were “Operable, but Degraded.” The POD also analyzed whether systems or components in areas adjacent to the affected shield block would be able to perform their functions during a seismic event. The POD concluded that all of the equipment that could be impacted by a seismic event either does not perform a safety function or would not be affected adversely.

The inspectors reviewed the CEB seismic gap POD and the existing finite element analysis associated with the CEB deformation. The inspectors concluded that the analysis reasonably demonstrated that the structures have adequate margin to continue to perform their intended function, and equipment protected or supported by the affected structures would not be compromised due to the seismic gap reduction. The inspectors noted that NextEra included compensatory measures to monitor this area for additional degradation, and that the effects of this POD are likely linked to other PODs and will be included in a final operability determination. Based upon the inspectors’ review, this POD provides reasonable assurance of operability of the CEB and containment, while awaiting permanent resolution of this non-conforming condition.

1R18 Plant Modifications (71111.18 – 2 samples)

Permanent Modifications

a. Inspection Scope

Containment Enclosure Ventilation Area Seal Repair and Modification

The inspectors evaluated a modification to repair a seismic/ventilation seal located in the containment enclosure ventilation area, under engineering change package 285777. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. Moreover, the inspectors verified the modification to the seal configuration/location did not impact the functional capabilities of the seal for all applicable accident conditions. In addition, the inspectors reviewed modification documents associated with the design change, including vendor test reports for the replacement seal material to verify the results were consistent with the applicable licensing and design bases.

Seismic Monitoring System Upgrade

The inspectors evaluated a modification/upgrade to the seismic monitoring system implemented by engineering change package 282184. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including post-installation acceptance testing, replacement of the control room seismic monitor cabinet, and replacement of two standalone seismic accelerographs, located in the SW pumphouse and the PAB. The inspectors also reviewed revisions to affected control room alarm response procedures, and interim emergency plan impacts during system installation and testing.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)a. Inspection Scope

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

- Containment building spray pump P-9A agastat inspection on April 11
- RHR heat exchanger outlet valve troubleshooting on April 13
- 'B' EDG maintenance from April 25 to May 2
- 'A' EDG maintenance outage from May 15 to 22
- SW CT pump P-110B, discharge valve replacement on May 26
- Digital rod position indication detector-encoder card replacement on June 1
- 'A' charging system pump, CS-P-2A, lube oil piping replacement on June 18

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 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:

- Safety injection isolation valve stroke test on March 23 (IST)
- SG pressure channel 1 analog channel operability test on April 11
- 'A' EDG operability surveillance 24-hour run on April 13
- Nuclear Instrument (NI)-41 detector saturation curve determination on April 21



- Emergency power sequencer relay inspection on April 28
- Turbine driven EFW pump quarterly test on June 22

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for Unit 1 licensed operators on May 16, 2016, which required emergency plan implementation by an operations crew. NextEra planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that NextEra evaluators noted the same issues and entered them into the CAP.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstone: Public Radiation Safety**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 4 samples)

a. Inspection Scope

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

Inspection Planning

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

Radiological Hazard Assessment

The inspectors conducted independent radiation measurements during walkdowns of the facility and reviewed the radiological survey program, recent plant radiation surveys for

radiological work activities, and any changes to plant operations since the last inspection to verify survey adequacy of any new radiological hazards for onsite workers or members of the public.

#### Instructions to Workers (1 sample)

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

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

#### Contamination and Radioactive Material Control

The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

#### Radiological Hazards Control and Work Coverage

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walkdowns and observation of radiological work activities. The inspectors assessed whether posted surveys; radiation work permits; worker radiological briefings and radiation protection job coverage; air sampling and engineering controls; and dosimetry monitoring were consistent with the present conditions. The inspectors examined the control of highly activated or contaminated materials stored within the spent fuel pool and the posting and physical controls for selected high radiation areas (HRAs), locked high radiation areas and very high radiation areas (VHRA) to verify conformance with the occupational performance indicator.

#### Risk-Significant HRA and VHRA Controls (1 sample)

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

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

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

#### Problem Identification and Resolution (1 sample)

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

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 – 3 samples)

a. Inspection Scope

The inspectors reviewed performance in assuring the accuracy and operability of radiation monitoring instruments used to protect occupational workers. The inspectors used the requirements in 10 CFR Part 20, 10 CFR Part 50, Appendix I; TSs; Offsite Dose Calculation Manual (ODCM); Regulatory Guides; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: Seabrook Station's 2014 and 2015 annual effluent and environmental reports; UFSAR; ODCM; Radiation Protection audits; records of in-service survey instrumentation; and procedures for instrument source checks and calibrations.

Walkdowns and Observations (1 sample)

The inspectors conducted walkdowns of plant area radiation monitors, continuous air monitors and process monitoring systems. The inspectors assessed material condition of these systems and that the monitor configurations aligned with the ODCM and the UFSAR. The inspectors checked the calibration and source check status of various portable radiation survey instruments and contamination detection monitors for personnel and equipment.

Calibration and Testing Program (1 sample)

The inspectors reviewed the current detector, electronic channel calibration, functional testing results and alarm set-points for: portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, air samplers, and continuous air monitors.

Instrument Calibrator

The inspectors reviewed the calibration standards used for portable instrument calibrations and response checks to verify that instruments were calibrated by a facility that used National Institute of Science and Technology traceable sources.

Calibration and Check Sources

The inspectors reviewed the plant waste stream characterization to assess whether the calibration sources used were representative of the radiation encountered in the plant.

Problem Identification and Resolution (1 sample)

The inspectors verified that problems associated with radiation monitoring instrumentation were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

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

a. Inspection Scope

The inspectors reviewed NextEra's submittal for the RCS specific activity and RCS leak rate performance indicators for Seabrook Unit 1 for the period of April 1, 2015 through March 31, 2016. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the performance indicator.

b. Inspection Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 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 NextEra entered issues into the CAP at an appropriate threshold, gave adequate attention to timely C/As, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, NextEra performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

## .2 Semi-Annual Trend Review

### a. Inspection Scope

The inspectors performed a semi-annual review of site issues, 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 of CAP backlogs. The inspectors also reviewed NextEra's CAP database for the first and second quarters of 2016 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 Seabrook Station's Self-Evaluation and Trending Analysis Report for first quarter of 2016, conducted under PI-AA-207-1000, "Station Self-Evaluation and Trending Analysis," Revision 5, to verify that NextEra personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

The inspectors evaluated a sample of departments that are required to provide input into the quarterly trend reports, which included the operations and maintenance 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 determined to be emerging or adverse trends and in some cases this review verified the appropriate disposition of resolved trends. The inspectors verified that these issues were addressed within the scope of the CAP or through department review and documentation in the quarterly trend report for overall assessment.

### b. Findings and Observations

No Findings were identified.

In general, with the exceptions discussed below, the inspectors noted that new and existing adverse trends – including potential trends, management awareness areas, and those trends identified as cognitive trends during Management Review Committee reviews – were consistent with those identified by the NRC through daily CR reviews and plant status walkdowns. Examples of such trends included control of foreign materials exclusion issues during outages (including the April/May EDG outages), an open trend associated with component mispositioning events (including two events discussed in Section 4OA3 of this report), fire protection door degradation issues, and housekeeping issues.

Inspectors identified a number of instances where due date extensions for C/As were not administered in accordance with the applicable revision of NextEra fleet procedure PI-AA-104-1000, "Corrective Action." These instances (summarized in Table 1 and Table 2) include six cases where the due dates for C/As or long-term corrective actions (LTCAs) were extended on multiple occasions without the required approval by the station's Management Review Committee. These instances also included three cases where the required documentation for due date extension approval for C/As or corrective actions to prevent recurrence (CAPRs) were not captured in the licensee's electronic

document management system as required by the established procedures. A number of these instances included C/As associated with the NextEra's response to ASR-related developments. A similar issue, associated with unapproved due date extensions, was also documented in NRC Inspection Report 05000443/2016008, related to ASR effects on safety-related concrete structures. The issue was associated with a CR (AR 01977456) that was also associated with one of the C/As (02014325-47) listed in Table 2 of this report. These performance deficiencies were considered to be minor in nature, in accordance with IMC 0612, Appendix B, "Issue Screening." NextEra addressed these issues in their CAP (AR 2139720 and AR 2139722) and developed C/As to coach staff and establish a requirement that due date extensions be reviewed on a weekly basis by the responsible department corrective action Program Coordinator in order to ensure that the required authorization has been provided. Accordingly, this performance deficiency is not subject to further enforcement action, but is being documented for performance assessment purposes.

The inspectors noted that, in February 2016, nuclear oversight staff identified issues associated with the multitude of due date extensions being implemented for low-significance-level C/As that do not require management approval/oversight for due date extensions (AR 2112323). Seabrook management subsequently took the C/A to increase management oversight of all C/A due date extensions and track improvements. However, in the scope of the February 2016 review of the issue, NextEra did not identify the above issues associated with due dates having been extended in a manner that was not in accordance with established procedures.

The inspectors also identified a number of instances where plant equipment was not adequately guarded in accordance with NextEra fleet procedure OP-AA-102-1003, "Guarded Equipment," Revision 13. In these cases, measures to restrict access to certain plant equipment for the purposes of mitigating plant risk, either in accordance with established risk-mitigation strategies or in accordance with management direction, were not taken. The equipment thus remained in a condition where an individual could access/manipulate the equipment without clear and present indication of the equipment's guarded status. However, there were no instances of inadvertent interaction with guarded equipment. These performance deficiencies were considered to be minor in nature in accordance with IMC 0612, Appendix B, "Issue Screening." NextEra addressed the issue in their CAP (AR 2128093), and inspectors thereafter noted improvements in NextEra's equipment guarding practices, including an increased emphasis on the importance of guarding equipment during morning staff meetings throughout the April/May EDG maintenance outages. Accordingly, this performance deficiency is not subject to further enforcement action, but is being documented for performance assessment purposes.

**TABLE 1****Corrective actions with due date extensions that were not approved in accordance with licensee procedures**

<b>Assignment number</b>	<b>CA Type</b>	<b>Date CR was Initiated</b>	<b>Number of due date extensions</b>	<b>Assignment description</b>
01687932-16	LTCA	02/13/2015	4	ASR Improvement Plan Action 5.2.13 - Action to update the Structures Monitoring Plan to include monitoring and acceptance criteria for measuring Z-direction expansion
01687932-15	CA	02/13/2015	3	ASR Improvement Plan Action 5.2.12 - Action to install Z-direction extensometers
02034392-16	CA	06/22/2015	2	Re-inspection of building seals, affected by ASR-related building movement, prior to returning them to maintenance rule category a(2) status
01872576-13	LTCA	10/14/2014	1	Track modification implementation to comply with requirements, associated with NRC CDBI inspection
01673900-98	CA	04/25/2012	10	Developments associated with response to an industry reactor trip analysis
01915226-26	CA	08/13/2014	5	Action associated with industry input regarding a LOOP event with a transformer fire

**TABLE 2****Corrective actions with due date extensions for which approval/justification was not documented in accordance with licensee procedures**

<b>Assignment number</b>	<b>CA Type</b>	<b>Date CR was Initiated</b>	<b>Number of due date extensions</b>	<b>Assignment description</b>
02014325-33	CAPR	08/19/2015	3	Provide a case study, associated with building movement (e.g. ASR-related) issues to station leadership every two years
02014325-47	CA	08/19/2015	3	Track completion of corrective action 1977456-17 to ensure crack gauges and invar wire are installed in the RHR vault to monitor crack progression
02014325-75	CA	12/31/2015	1	Revise analysis in Foreign Print 100985 (associated with CEB deformation due to ASR with refined modeling to better quantify and distribute the effects of ASR induced strains

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples).1 (Closed) Licensee Event Report (LER) 05000455/2016-002-00: Emergency Feedwater System Actuation on Steam Generator Low-Low Levela. Inspection Scope

On March 2, 2016, at 1:12pm, during a plant cooldown, a valid, but inadvertent, actuation of the EFW occurred when 'B' SG level reduced to 20%. The lowering level was a result of an unanticipated trip of the SUFP on low condensate storage tank (CST) level. The SUFP was restarted and feed flow had been restored when the actuation took place. Operators subsequently took actions to stabilize the plant and return EFW to its standby alignment.

NextEra personnel completed a root cause evaluation to determine the cause of the SUFP trip and subsequent inadvertent EFW actuation. NextEra thereafter took C/As, including the development of training to reinforce the associated departmental instructions and the revision of associated alarm responses.

The inspectors reviewed LER 2016-002-00, NextEra's root cause evaluation, and associated C/As. This LER is closed.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR, Appendix B, Criterion V, "Instructions Procedures, and Drawings," was identified, because NextEra did not ensure that activities affecting quality were accomplished in accordance with documented instructions. Specifically, while implementing a procedure following a plant trip that occurred on March 2, 2016, NextEra staff performed steps of a procedure in a manner that was prohibited by a departmental instruction, leading to an automatic initiation of EFW to maintain adequate SG level.

Description. On March 2, 2016, Seabrook Unit 1 was in Operational Mode 3 following a turbine and reactor trip associated with a perturbation in the turbine control system. The operating crew entered into emergency operating procedures and appropriately transitioned into ES-0.1, "Reactor Trip Response." As part of ES-0.1, EFW was secured and the SUFP was aligned to the CST to supply water to the SGs.

Subsequently, the operating crew transitioned to OS1000.11, "Post Trip to Hot Standby," Section 4.1, which contained actions to prepare for a plant cool-down. In parallel, the crew also began implementing steps in Section 4.4 of the procedure. The operators' actions were contrary to operations department instruction (ODI)-87, which stated that "[m]ajor procedure sections (i.e. 4.1, 4.2, etc.) MUST be completed prior to performing steps in the next section." The operating crew took these steps based on the belief that they were only implementing preparatory actions. While work was being performed on the two sections, a shift turnover took place, demonstrating that both the off-going and incoming operating crews proceeded contrary to the ODI-87 requirement.

NextEra's evaluation concluded that performance of steps in Section 4.4, resulted in a plant configuration where water was transferred from the CST to the SUFP and the



condenser hotwells at a rate faster than CST makeup functions were capable of maintaining CST inventory. If the operators had completed the steps in Section 4.1 of OS1000.11, prior to proceeding to Section 4.4, the condensate cleanup filters would have been placed in service and SUFP suction would have been aligned to both the CST and the hotwells via the filters, which would have allowed CST inventory to be maintained.

Prior to the event, a CST low level alarm was received in the control room, and the operating crew subsequently commenced a plant cooldown in accordance with OS1000.04, "Plant Cooldown from Hot Standby to Cold Shutdown," even though the SUFP suction had not yet been aligned to the hotwells due to unsatisfactory results from a chemistry analysis of the condensate cleanup filters. These actions resulted in decreasing SG levels (temperature shrink) and increasing feedwater flow. The lowering CST level and SUFP suction pressure resulted in a trip of the SUFP that caused continued lowering of SG water levels.

Subsequent to the SUFP trip, the shift manager established an administrative setpoint to manually start the 'B' EFW pump if narrow range SG levels dropped below 24%. The crew proceeded to halt the cooldown, and aligned the SUFP suction to the hotwells, to restore feedwater flow. When the SUFP was restarted, the resultant introduction of cold feedwater led to a further reduction (shrink) in SG level, as expected, and narrow range SG levels dropped below the 24% administrative setpoint without operator action to manually start EFW to maintain SG inventory, contrary to the administrative guidance previously established by the shift manager. As a result, narrow range SG level continued to lower until the 'B' SG level dropped below 20%, automatically initiating the EFW pumps. Operators subsequently took actions to stabilize the plant.

This event was entered into NextEra's CAP (AR 2114495), and a root cause evaluation (RCE) was initiated. This evaluation determined the root cause of the inadvertent EFW actuation to be a failure to adhere to procedural guidance listed in ODI-87. The evaluation stated, "All individuals involved were aware of the requirements of ODI-87, yet they did not challenge each other or correct the behavior." The RCE prescribed a series of C/As, including the development of training to reinforce the guidance contained in ODI-87 and revision of alarm response procedures for CST low level, SUFP trip, and SG low level alarms.

Analysis. The inspectors determined that the failure to adhere to plant operating instructions, and ensure adequate control of plant conditions, was a performance deficiency within NextEra's ability to foresee and prevent. The inspectors determined that this performance deficiency was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone, and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability (loss of FW) and challenge critical safety functions during shutdown as well as power operations. Specifically, failure to adhere to the guidance prescribed in ODI-87 led plant operators to perform a combination of steps that resulted in the inadvertent tripping of the SUFP on low suction pressure. The subsequent loss of feedwater flow to the SGs impacted SG levels and resulted in an automatic actuation of the EFW pumps. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because the performance deficiency did not cause the loss of

mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. Specifically, the actuation of the EFW pumps occurred in accordance with designed plant response and ensured that adequate feedwater levels were maintained in the SGs.

The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Challenge the Unknown, because NextEra did not ensure that individuals stopped when faced with uncertain conditions. Specifically, individuals involved did not maintain a questioning attitude during a shift turnover meeting, and thus did not take the opportunity to adequately challenge the basis for a decision to disregard a department instruction. Two separate crews missed the opportunity to challenge this decision. Additionally, individuals did not stop work activities when confronted with unexpected conditions that delayed aligning the SUFP suction to the hotwells, and the operating crew did not resolve these conditions prior to commencing a plant cooldown. [H.11]

Enforcement. 10 CFR 50, Appendix B, Criterion V, requires, in part, that activities affecting quality be accomplished in accordance with documented instructions. Specifically, instruction in ODI-87 requires that “[m]ajor procedure sections (i.e 4.1, 4.2, etc.) must be completed prior to performing steps in the next section.” Contrary to the above, following a reactor trip on March 2, 2016, while performing procedure OS1000.11 associated with plant recovery, NextEra staff did not complete a major procedure section (4.1) prior to performing steps in another section (4.4) when steps were simultaneously performed in these two sections (4.1 and 4.4) of the procedure in a manner that was prohibited by ODI-87. The sequence of steps performed introduced plant conditions that led to a loss of feedwater flow from the SUFP to the SGs, and an automatic initiation of EFW pumps. NextEra entered this issue into their CAP (AR 2114495) and subsequently initiated a root cause evaluation to determine the factors which contributed to the event. Additionally, NextEra took C/As to provide additional training and guidance for their staff and to resolve issues with existing procedures, which were determined to have been contributing factors during the event. This violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000443/2016002-01, Automatic Initiation of Emergency Feedwater Resulting from Performance of Procedural Steps in a Manner Prohibited by Documented Instructions)**

## .2 Inadvertent Letdown Isolations

### a. Inspection Scope

On two separate occasions, on May 25 and June 3, 2016, while operators were performing a test associated with containment isolation functions, an inadvertent isolation of letdown occurred when performed actions led to the accidental opening of an electrical connection that was intended to be bypassed by an installed electrical jumper. Following the loss of letdown, operators entered into the requisite AOP, and took actions to restore letdown flow and charging flow, and to restore boration levels within the RCS to ensure proper steady-state reactivity levels. NextEra personnel completed apparent cause evaluations to determine the cause of both of the letdown isolation events and took C/As, including making necessary changes to the associated procedure and providing coaching to staff.

The inspectors reviewed NextEra's apparent cause evaluation for the two events, along with associated C/As, and identified a self-revealing performance deficiency that was characterized as more than minor and is documented below.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR, Appendix B, Criterion V, "Instructions Procedures, and Drawings," was identified because NextEra did not ensure that activities affecting quality were prescribed by documented procedures of a type appropriate to the circumstances and that these activities were accomplished in accordance with these procedures. Specifically, a procedure associated with the testing of safety-related containment isolation functions did not contain sufficient instruction to ensure proper control of plant configuration; thus implementation of this procedure resulted in an inadvertent letdown isolation. Additionally, while attempting to perform this test on a subsequent occasion, individuals performed additional steps not prescribed in the associated procedure; the execution of these additional steps resulted in an additional inadvertent letdown isolation.

Description. On May 25, 2016, NextEra was performing a quarterly slave relay test associated with safety-related containment isolation functions. The associated procedure, OX1456.83, "Train B ESFAS Slave Relay K624 Quarterly Go Test," Revision 6, contained a step calling for the installation of a jumper to disable operation of letdown isolation valve CS-V-150 during performance of the test. Closure of CS-V-150 during testing would result in a loss of letdown flow, requiring operator action to stabilize and restore plant configuration.

During performance of the procedure, a technician installed the electrical jumper associated with CS-V-150 that also contained a switch to allow adjustment to the open or closed position. The inspectors noted that the procedure did not contain additional instructions, guidance, or verification requirements to ensure that the jumper's switch was in its required configuration to ensure a closed connection prior to performance of certain critical steps within the procedure. During continued performance of the procedure, with the electrical jumper's switch in the open position, a slide link was terminated which opened the connection that the jumper was intended to bypass. This open circuit resulted in the closure of CS-V-150 and a loss of letdown flow.

NextEra entered the event into their CAP (AR 0214335) and investigated the associated causal factors. NextEra determined that the procedural guidance on the use of the jumper switch was inadequate and cited ineffective communication of the status of this equipment as a contributing factor. NextEra also established C/As to perform an Apparent Cause Evaluation for the event and make necessary changes to the associated procedure and other procedures that implemented this type of electrical jumper. Procedure changes were incorporated into Revision 7 of OX1456.83, providing more detailed instruction regarding the installation of the associated jumper and independent verification of its configuration.

Subsequently, on June 3, 2016, while re-performing the test, technicians properly installed the electrical jumper and control room operators proceeded with actuation of the test signal for Phase 'A' containment isolation. A subsequent procedure step required the technicians to verify contact status for the actuated relay device. At this point the technicians agreed to perform a test of the multimeter being used to confirm its

operation and lead integrity, an action which was not explicitly listed in the procedure and required the technicians to remove one of the meter's test leads. Instead, the technician performing the action mistakenly disconnected one of the electrical jumper leads, which was located adjacent to the meter test lead. Disconnection of the electrical jumper terminated the circuit, which satisfied the logic for operation of CS-V-150, and resulted in closure of the valve and a loss of letdown flow.

NextEra entered the event into their CAP (AR 2136006) and investigated the human performance aspects associated with the event. NextEra determined that the removal of meter test leads was not a step explicitly in the continuous-use procedure. It also required the technicians to perform steps to manipulate test equipment that was connected to plant equipment without documentation or verification. NextEra management acknowledged that these steps, which were considered a "skill-of-worker" technique, were inappropriate and unnecessary, given that testing equipment is calibrated and tested prior to performing work. Additionally, NextEra's review of the event determined that failure to use human error reduction techniques, such as the "STAR" ("Stop, Think, Act, Review") process, while attempting to remove the multimeter test leads was a significant contributing factor.

On both occasions, following the loss of letdown flow, the inspectors noted that control room operators entered into the requisite abnormal operating procedure, OS1202.01, "Loss of Letdown," Revision 13, and took actions to restore letdown flow and charging flow, and to restore boration levels within the RCS to ensure proper steady-state reactivity levels. Once plant configuration was restored, testing equipment was removed, and the testing procedure was exited.

Analysis. The inspectors determined that the failure to establish and/or adhere to adequate testing procedures and thereby ensure control of plant configuration was a performance deficiency within NextEra's ability to foresee and prevent. The inspectors determined that this performance deficiency was more than minor because it was associated with the Procedure Quality and the Human Performance attributes of the Initiating Events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability during power operations. Specifically, for the event that took place on May 25, the procedure did not contain critical steps necessary to install test equipment in a manner sufficient to maintain control of plant configuration. During the June 3 event, individuals installing testing equipment performed steps that were not listed in the associated procedure. As a result, actions taken on these two occasions led to an inadvertent isolation of letdown flow, which required operators to enter into an abnormal operating procedure to restore control and stability of RCS inventory and reactivity levels. In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," both dated June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green) because the performance deficiency did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition.

The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Procedural Adherence, because NextEra did not ensure that individuals followed processes and procedures appropriately. Specifically, during the event on May 25, individuals involved did not adequately review procedures and

instructions before performing work to validate that they were appropriate for the scope of work, in that, they did not recognize the need for more detailed instructions in order to ensure that a jumper cable, necessary to maintain the configuration of a letdown isolation valve, was installed correctly. During the event on June 3, individuals involved did not ensure that they only manipulated plant equipment when appropriately authorized and directed by approved plant procedures or work instructions. Instead, these individuals relied upon trained skills/actions when manipulating testing equipment in a manner not explicitly prescribed by the procedure. Furthermore, the individuals manipulating this testing equipment did not use human error reduction techniques, such as the “STAR” (Stop, Think, Act, Review) process. [H.8]

Enforcement. 10 CFR 50, Appendix B, Criterion V, requires, in part, that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstances and that these activities be accomplished in accordance with those procedures. Contrary to the above, a NextEra procedure implemented on May 25, 2016, during the performance of a test associated with a safety-related containment isolation function, did not contain sufficient instruction to ensure that critical steps were taken to install testing equipment in a manner that would maintain plant configuration and prevent an inadvertent letdown isolation. On June 3, 2016, while re-performing the same test, NextEra technicians performed steps not prescribed in the associated procedure and executed these steps in a manner that led to an inadvertent letdown isolation. NextEra entered these issues into their CAP (AR 2134335 and AR 2136006) and subsequently performed apparent cause evaluations for the two events, made necessary changes to the associated procedure, and provided coaching to NextEra staff. This violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000443/2016002-02, Multiple Letdown Isolations Resulting from an Inadequate Procedure and the Performance of Steps Not Prescribed by Established Procedures)**

#### 4OA6 Meetings, Including Exit

On July 20, 2016, the inspectors presented the inspection results to Mr. Eric McCartney, Site Vice President, and other members of the Seabrook staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

## **ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

E. McCartney, Site Vice President  
 R. Dodds, Plant General Manager  
 K. Boehl, Senior Rad Protection Analyst  
 M. Bianco, Radwaste Supervisor  
 V. Browne, Senior Licensing Engineer  
 K. Douglas, Maintenance Director  
 D. Hickey, Radiation Protection Supervisor  
 K. Browne, Licensing Manager  
 V. Pascucci, Nuclear Oversight Manager  
 D. Ritter, Site Operations Director  
 D. Robinson, Chemistry Manager  
 T. Smith, Radiation Protection Supervisor  
 D. Strand, Radiation Protection Manager

#### NRC Personnel:

A. Bufford, Structural Engineer, Office of Nuclear Reactor Regulation (NRR)  
 B. Lehman, Structural Engineer, NRR

### LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

#### Opened/Closed

05000443/2016002-01	NCV	Automatic Initiation of Emergency Feedwater Resulting from Performance of Procedural Steps in a Manner Prohibited by Documented Instructions (Section 4OA3.1)
05000443/2016002-02	NCV	Multiple Letdown Isolations Resulting from an Inadequate Procedure and the Performance of Steps Not Prescribed by Established Procedures (Section 4OA3.2)

#### Closed

05000443/2016-002-00	LER	Emergency Feedwater System Actuation on Steam Generator Low-Low Level (Section 4OA3.1)
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## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures

LN0561.174, 72 Month Mitsubishi Gas Circuit Breaker 52 Preventive Maintenance, Revision 3  
 OP-AA-102-1002, Seasonal Readiness, Revision 13  
 OS1046.04, 345KV Operations, Revision 41  
 OS1246.02, Degraded Vital AC Power (Plant Operating), Revision 16

#### Condition Reports

2123799	2124074	2125531	2130543	2130558	2131134
2131135	2131392	2133587	2139744		

#### Maintenance Orders/Work Orders

40204395	40314055	40327451	40365809	40394927	40405235
40433687	40443099	40456432			

#### Miscellaneous

2016 Seasonal Readiness Certification to NextEra Energy CNO, dated 5/24/2016  
 Hood, Patterson and Dewar Job No. 4052.000, Seabrook Station Site Grounding Test Report, dated 10/24/2014  
 ISO New England Master/LCC No. 1, "Nuclear Plant Transmission Operations," Revision 15  
 ISO New England Master/LCC No. 1, Attachment D, Revision 18  
 SSTR, Technical Requirements Manual, TR 31-3.1, Supplemental Emergency Power System Availability Requirements, Revision 145

### **Section 1R04: Equipment Alignment**

#### Procedures

OS1002.02, Operation Of Letdown, Charging And Seal Injection, Revision 49  
 OS1013.04, Residual Heat Removal Train B Startup and Operation, Revision 28  
 OS1026.02, Operating the DG 1A Lube Oil System, Revision 16  
 OS1026.03, Operating the DG 1A Jacket Cooling Water System, Revision 11  
 OS1026.05, Operating the DG 1A Fuel Oil System, Revision 18  
 OS1035.01, Aligning The Emergency Feedwater System For Automatic Initiation, Revision 20  
 OS1048.14, Vital Bus 11B Operation, Revision 10  
 OX1436.08, StartupFeed Pump Quarterly Surveillance, Revision 13

#### Condition Reports

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**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**

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Station Clock Reset, Letdown Isolation during Slave Relay Testing

Operations Department Instruction 87

## LIST OF ACRONYMS

AC	alternating current
ADAMS	Agencywide Document Access and Management System
AOP	abnormal operating procedure
C/A	corrective action
CAPR	corrective action to prevent recurrence
CAP	corrective action program
CEB	containment enclosure building
CFR	<i>Code of Federal Regulations</i>
CR	condition report
CST	condensate storage tank
CT	cooling tower
EDG	emergency diesel generator
EFW	emergency feedwater
GSU	generator stepup
HRA	high radiation area
IMC	Inspection Manual Chapter
kV	kilovolt
LER	licensee event report
LTCA	long term corrective action
MR	maintenance rule
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
ODCM	offsite dose calculation manual
ODI	operations department instruction
PAB	primary auxiliary building
POD	prompt operability determination
RCS	reactor coolant system
RCE	root cause evaluation
RHR	residual heat removal
SG	steam generator
SSC	structure, system, and component
SUFP	startup feed pump
SW	service water
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VHRA	very high radiation area
WO	work order