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

November 5, 2015

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 – INTEGRATED INSPECTION REPORT 05000443/2015003

Dear Mr. Curtland:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Seabrook Station, Unit No. 1. The enclosed report documents the inspection results, which were discussed on October 9, 2015, 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.

No NRC-identified or self-revealing findings were identified during this inspection.

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/

Glenn T. Dentel, Chief
Reactor Projects Branch 2
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000443/2015003
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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/

Glenn T. Dentel, Chief
Reactor Projects Branch 2
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000443/2015003
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

DISTIRBUTION w/encl: **(via e-mail)**
DDorman, RA
DLew, DRA
MScott, DRP
JColaccino, DRP
RLorson, DRS
GSuber, DRS
FBower, DRP
GDentel, DRP
RBarkley, DRP
MDraxton, DRP
CHighley, DRP
PCataldo, DRP, SRI
CNewport, DRP, RI
ACass, DRP, Resident AA
JJessie, RI, OEDO
RidsNrrPMSeabrook Res
RidsNrrDorlLpl1-2 Res
ROPreports Res

DOCUMENT NAME: G:\DRP\BRANCH3\Inspection Reports\Seabrook\3Q15\SB IR2015003 final.docx
ADAMS Accession No. **ML15309A559**

☑ SUNSI Review		☑ Non-Sensitive ☐ Sensitive		☑ Publicly Available ☐ Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	PCataldo/ *by phone*	RBarkley/ RSB	GDentel/ GTD		
DATE	11/ 05 /15	11/04 /15	11/05 /15		

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-443
License No.:	NPF-86
Report No.:	05000443/2015003
Licensee:	NextEra Energy Seabrook, LLC
Facility:	Seabrook Station, Unit No.1
Location:	Seabrook, New Hampshire 03874
Dates:	July 1, 2015 through September 30, 2015
Inspectors:	P. Cataldo, Senior Resident Inspector C. Newport, Resident Inspector J. Vazquez, Project Engineer J. Richmond, Senior Reactor Inspector B. Dionne, Health Physicist
Approved by:	Glenn T. Dentel, Chief Reactor Projects Branch 2 Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY

IR 05000443/2015003; 07/01/2015-09/30/2015; Seabrook Station, Unit No. 1; Routine Integrated Inspection Report.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

No findings were identified.

REPORT DETAILS

Summary of Plant Status

Seabrook operated at full power for the majority of the period. On September 9, 2015, Seabrook commenced a gradual reduction from full power for a planned coastdown for the upcoming refueling outage 17 (OR17). On September 27, 2015, power was further reduced and held at 55% to perform leak checks on selected main condenser tubes. On September 30, 2015, Seabrook commenced a normal reactor shutdown for the OR17 refueling outage. 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 – 1 sample)

.1 External Flooding

a. Inspection Scope

During the period of July 6 to 9, 2015, the inspectors performed an inspection of the external flood protection measures for Seabrook Station. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Chapters 2.4.2.2 and 3.4.1, 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 outside areas, the fuel storage building, the control building, and the emergency diesel generator (EDG) 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 (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- ‘A’ EDG return to service on July 14, 2015
- Service water (SW) during circulating water wood flour addition on July 23, 2015
- ‘A’ EDG during ‘B’ EDG inoperability on August 24, 2015
- ‘A’ charging pump return to service on September 18, 2015

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, technical specifications (TSs), work orders (WOs), condition reports (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 corrective action program (CAP) for resolution with the appropriate significance characterization.

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

- Primary auxiliary building (PAB) piping penetration area (PP-F-1B-Z, PP-F-2B-Z, PP-F-5B-Z) on July 8, 2015
- Cable spreading room (CB-F-21-A) on July 22, 2015
- SW cooling tower (CT) fire area (CT-F-3-0) on July 30, 2015
- 'B' residual heat removal (RHR-F-1A-Z, RHR-F-2A-Z, RHR-F-3A-Z, RHR-F-4A-Z, RHR-F-4A-Z1, RHR-F-4A-Z2) on August 13, 2015
- Turbine building (TB-F-1A-Z, TB-F-1C-Z, TB-F-1-0) on September 28, 2015

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on September 17, 2015, that involved a fire in the PAB 25' level. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that NextEra personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with NextEra's fire-fighting strategies.

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 September 10, 2015, which included plant cooldown from hot standby to cold shutdown, reactor coolant system solid water operations, and crew turnovers during complex evolutions. 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 manager. 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 infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in NextEra's Administrative Procedure OP-AA-100-1000, "Conduct of Operations," Revision 16. In particular, the inspectors observed a brief for circulating water wood flour injection on July 22, 2015, control room shift turnover and alarm response on August 12, 2015, and TS entry verification on August 24, 2015. In addition, inspectors observed 'A' EDG common cause TS-required start on August 25, 2015, 'B' EDG instrumented run on August 26, 2015, and 'B' EDG final operability run on August 29, 2015. On August 4, 2015, inspectors also observed deboration activities and alarm response actions for elevated unidentified leakrate. The inspectors observed test performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 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 were 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.

- Relay and component deficiencies identified from 'B' EDG load swing event on August 24, 2015
- Building seals on September 4, 2015

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- 'A' SW transfer to the CT on July 16, 2015
- Solid state protection system (SSPS) 'A' actuation logic test on July 23, 2015
- Steam dump and emergent primary component cooling pump maintenance on July 29, 2015
- Supplemental emergency power system (SEPS) annual maintenance outage on August 16 to 19, 2015
- Inoperability of 'B' EDG and switchyard activities on August 25, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 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:

- Paul-Munroe snubber code compliance on August 12, 2015
- Containment enclosure ventilation area north wall flexural deformation on August 20, 2015
- 'B' EDG unexpected load swings on August 24, 2015
- Operator workaround (OWA) annual review on September 13, 2015
- 'A' centrifugal charging pump incorrect oil addition on September 18, 2015

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 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, such as in the case of OWAs, the inspectors determined whether the measures in place would function as intended and were properly controlled by NextEra. Based on the annual review of the OWAs currently in effect at Seabrook, the inspectors verified that NextEra identified OWAs at an appropriate threshold and addressed them in a manner that effectively managed OWA-related adverse effects on operators and SSCs.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

.1 Permanent Modifications

a. Inspection Scope

The inspectors evaluated a modification to resolve fire-induced multiple spurious operation concerns associated with an interlock for the refueling water storage tank (RWST) suction valve auto open on volume control tank valve closure, which was implemented by engineering change 271261. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including the addition of auxiliary relays, interlocks, main control board selector switches, and associated labeling and wiring. The inspectors also reviewed revisions to the control room alarm response procedures, emergency operating procedures, and interviewed engineering and operations personnel to ensure awareness of the modification and that the changes to procedures could be reasonably performed.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- CBS-V-38 thermal overload relay replacement on July 15, 2015
- 'A' control building air handling fan and damper maintenance on July 16, 2015
- 'C' atmospheric steam dump valve positioner solenoid replacement on August 11, 2015
- SEPS retest following maintenance on August 21, 2015
- 'B' EDG retest on August 29, 2015, following load swings on August 24, 2015
- Steam-driven emergency feedwater pump discharge valve lubrication on September 23, 2015

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 2 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:

- NI-N-41 power range nuclear instrumentation (NI) operational test with annual functional test of SSPS input relays on July 29, 2015
- Reactor coolant system unidentified leakrate surveillance on August 5 to 7, 2015

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

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 (RGs), and the procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the performance indicators for the occupational exposure cornerstone, radiation protection program audits, and reports of operational occurrences in occupational radiation safety since January 2015.

Radiological Hazard Assessment

The inspectors reviewed recent plant radiation surveys and any changes to plant operations since the last inspection to identify any new radiological hazards for onsite workers or members of the public.

Instructions to Workers

The inspectors observed several 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.

Contamination and Radioactive Material Control

The inspectors observed the monitoring of potentially contaminated material leaving the radiological control area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material.

Risk-Significant High Radiation Area and Very High Radiation Area Controls

The inspectors reviewed the controls and procedures for high radiation areas, very high radiation areas, and radiological transient areas in the plant.

Problem Identification and Resolution

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

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

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

Inspection Planning

The inspectors conducted a review of Seabrook Station's collective dose history and trends; ongoing and planned radiological work activities; radiological source term history and trends; and ALARA dose estimating and dose tracking procedures.

Verification of Dose Estimates and Exposure Tracking Systems

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

Source Term Reduction and Control

The inspectors reviewed the current plant radiological source term and historical trend, plans for plant source term reduction, and contingency plans for changes in the source term as the result of changes in plant fuel performance and changes in plant primary chemistry including zinc injection.

Problem Identification and Resolution

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

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07 – 1 sample)

a. Inspection Scope

The inspectors reviewed the Radiological Environmental Monitoring Program (REMP) to validate the effectiveness of the radioactive gaseous and liquid effluent release program. The inspectors used the requirements in 10 CFR 20; 40 CFR 190; 10 CFR 50, Appendix I; and the Seabrook Station's TSs, Offsite Dose Calculation Manual (ODCM), and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed: Seabrook Station 2013 and 2014 Annual Radiological Environmental Operating Report; REMP program audits; ODCM changes; land use census; and inter-laboratory comparison program results.

Onsite Inspection

The inspectors reviewed and/or observed the following items:

- Sample collection, monitoring, and dose measurement stations (e.g., thermoluminescent dosimeter and air monitoring)
- Calibration and maintenance records for air sample and dosimetry measurement equipment

- Environmental sampling of the effluent release pathways specified in the ODCM, specifically, milk and surface water
- Meteorological tower and meteorological data readouts
- Meteorological instrument operability status and calibration results
- Missed and/or anomalous environmental samples identified, resolved, and reported in the annual radioactive environmental monitoring report
- Positive environmental sample assessment results
- The groundwater monitoring program as it applies to selected potential leaking SSCs and early leak detection
- 10 CFR 50.75(g) records of leaks, spills, and remediation since the previous inspection
- Changes to the ODCM due to changes to the land use census, long-term meteorological conditions, and/or modifications to the environmental sample stations
- Environmental sample laboratory analysis results, and measurement detection sensitivities
- Results of the laboratory quality control program audit, and the inter-and intra-laboratory comparison program results

Identification and Resolution of Problems

The inspectors evaluated whether problems associated with the REMP were identified at an appropriate threshold and properly addressed in NextEra's CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index (3 samples)

a. Inspection Scope

The inspectors reviewed NextEra's submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2014, through June 30, 2015:

- Emergency alternating current power system (MS06)
- High pressure injection system (MS07)
- Heat removal system (MS08)

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed NextEra's operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

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

b. Findings

No findings were identified.

.2 Annual Sample: Review of Fire Protection Impairments (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of NextEra's evaluations and corrective actions associated with multiple fire protection system impairments in four specific areas:

- Containment enclosure ventilation area seismic gap fire seals
- Fire water main header piping leak
- Repetitive and multiple fire detection alarms
- Inoperable fire doors

The inspectors assessed NextEra's problem identification threshold, problem analysis, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether NextEra was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of NextEra's CAP, fire protection program, and fire protection quality assurance requirements. The inspectors interviewed engineering and operations personnel to assess the effectiveness of the implemented corrective actions, the reasonableness of the planned corrective actions, and to evaluate the extent of any on-going problems.

b. Findings and Observations

No findings of significance were identified.

On June 26, 2014, Seabrook identified a large leak in a buried branch line from the fire water main loop outside of the protected area. The inspector reviewed NextEra's functionality determination for the fire waster system and concluded that nextEra had appropriately considered the fire water main loop capability and capacity to supply the required water suppression systems (e.g., sprinklers and hydrants) with a portion of the main loop isolated during leak repairs. The inspectors' review of NextEra's apparent cause evaluation (ACE) and corrective actions identified several weaknesses.

NextEra's ACE determined that large rocks, in contact with the buried pipe, had damaged the external coating and resulted in through-wall corrosion from the outside. The ACE concluded that unregulated backfill for buried pipe located outside of the protected area was the most probable cause. NextEra concluded that no extent of condition inspections were necessary on the fire water loop outside of the protected area because that portion of the fire water system was not required to be maintained to support water suppression systems that were required by the Technical Requirements Manual (TRM) to protect safety-related equipment. In addition, NextEra concluded that additional fire water piping leaks outside of the protected area were likely. The inspectors concluded that the ACE extent of condition was inconsistent with the physical layout of the fire water system because the three fire pumps, two water storage tanks, and sections of the main header fire loop were also located outside of the protected area.

The inspectors reviewed Seabrook's current licensing basis (CLB) for the fire water system and identified that the yard fire main loop, as described in the CLB, consisted of a single loop around both Units 1 and 2, with the Unit 2 portion outside of the protected area (Unit 2 construction had been stopped and abandoned in-place), with three pumps supplying water to each half of the main loop to satisfy the single failure criterion and ensure that a single pipe break could not disable all water suppression systems. Therefore, the inspectors concluded that the buried fire main loop outside of the protected area was required to be maintained by Seabrook's CLB and was therefore also required to support Unit 1 TRM water suppression systems. The inspectors concluded that the failure to perform an extent of condition review and the failure to identify the Unit 2 portion of the fire loop as necessary to support Unit 1 were minor issues, because NextEra adequately corrected a condition adverse to fire protection (i.e., fixed the leak and restored the main loop) within a reasonable time period.

In addition, the inspectors reviewed action request 00213052-05, "Buried and Underground Piping and Tanks Integrity Program," which NextEra had implemented to meet a voluntary industry initiative, using the guidance provided in NEI 09-14, "Management of Underground Piping & Tank Integrity." NEI 09-14 required external visual inspections on buried piping to provide reasonable assurance of buried piping integrity. However, NextEra's program excluded fire mains from external visual inspection based on an assumption that monitoring the fire jockey pump run times would be sufficient to ensure fire water system integrity. The inspectors determined that the jockey pump run times, immediately prior to the pipe leak, had not sufficiently changed and did not provide any advanced warning of the impending pipe leaks. Therefore, the inspectors concluded that NextEra's buried piping program had excluded

fire water pipe inspections based on an assumption that was inconsistent with plant operating experience. The inspectors concluded that the identified deficiency in the underground piping integrity program was a minor issue because it was a weakness in implementing a voluntary industry initiative.

NextEra entered these issues into their CAP as ARs 02059404, 02059408, 02076461, and 02076463, and is evaluating the future conduct of external inspections of buried fire water piping.

4OA6 Meetings, Including Exit

On October 9, 2015, 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.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

D. Curtland, Site Vice President
R. Dodds, Plant General Manager
K. Boehl, ALARA Engineer
V. Brown, Senior Licensing Engineer
K. Douglas, Maintenance Director
A. Giotas, Senior Chemist
M. Haidul, Fire Protection System Engineer
R. Law, Fire Protection Coordinator
M. Ossing, Licensing Manager
V. Pascucci, Nuclear Oversight Manager
D. Ritter, Site Operations Director
D. Robinson, Chemistry Manager
D. Strand, Radiation Protection Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
IN1090.13, Response to Natural Phenomena Affecting Plant Operations, Revision 5
OS1200.03, Severe Weather Conditions, Revision 24

Miscellaneous
UFSAR Chapter 2
UFSAR Chapter 3

Section 1R04: Equipment Alignment

Procedures
ON15-01-04, Circulating Water System Wood Flour Injection, Revision 0
OP-AA-1000, Infrequently Performed Tests or Evolutions, Revision 4
OS1026.04, Operating DG 1A Starting Air System Revision 13
OS1026.13, Operating the DG 1B Fuel Oil System, Revision 13
OX1426.18, Aligning DG 1A Controls for Auto Start, Revision 5
OX1456.01, Charging Pump A & B Quarterly Flow and Valve Stroke Test and 18 Month Remote Position Verification, Revision 19
OX1456.28, Train A ESFAS Slave Relay K616 Quarterly Block/Go Test, Revision 9

Condition Reports
01647339 01951933

Maintenance Orders/Work Orders
40352716 94023457 94093631

Miscellaneous
EC-284349, Engineering Evaluation for Use of Wood Flour in the Condensers, Revision 0

Section 1R05: Fire Protection

Procedures
FPI.43, Management Expectations for Fire Drill Performance, Revision 3
FPI.44, Management Expectations for the Use of SCBA and Compliance with the Respiratory Protection Final Rule, Revision 1
FPI.67, Conduct of Fire Drills, Revision 0
OS1200.00, Response to Fire or Fire Alarm Actuation, Revision 22

Condition Reports
01985100 01999715 02061807 02065736 02067936 02068629
02074978 02075160 02075437

Maintenance Orders/Work Orders
01199603

Miscellaneous
EC 145101
Fire Drill Scenario dated September 17, 2015
Safety Evaluation Report, Section 9.5.1.4
Seabrook Station Evaluation and Comparison to APSCB 9.5-1, Appendix A, Revision 14
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, CB-F-2A-A
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, PP-F-1B-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, PP-F-2B-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, PP-F-5B-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, RHR-F-1A-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, RHR-F-2A-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, RHR-F-3A-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, RHR-F-4A-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, RHR-F-4A-Z1
Seabrook Station Fire Protection Pre-Fire Strategies, Volume I, RHR-F-1A-Z2
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, TB-F-1A-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, TB-F-1C-Z
Seabrook Station Fire Protection Pre-Fire Strategies, Volume II, TB-F-1-0
Technical Requirement 11, “Fire Related Assemblies”

Section 1R11: Licensed Operator Requalification Program

Procedures
OS1000.04, Plant Cooldown From Hot Standby to Cold Shutdown, Revision 49

Miscellaneous
Seabrook Lesson Plan SBK LOP L3530C15D, RCS Solid Water Operations, Revision 2

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-100-2002, Maintenance Rule Program Administration, Revision 2
ER-AA-201-2002, System Performance Monitoring, Revision 2
PEG-24, Maintenance Rule Goal Setting and Monitoring, Revision 8
PEG-45, Maintenance Rule Program Monitoring Activities, Revision 17

Condition Reports
01636419 02021411 02034392 02066852 02067564 02068491
02069228 02070090

Maintenance Orders/Work Orders
40408585

Miscellaneous
Catalog ID 434724, Gould J13 Relay Replacement, Type GE CR-120B
Condition Report 06-10146
Condition Report 08-09385
EE-10-010, Maintenance Rule PRA Basis Document PRA Risk Ranking and Performance Criteria Based on SSPSS-2009, dated March 2011
Maintenance Rule Improvement Plan for Building Seals
NUMARC 93-01, Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Revision 2

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
IX1680.931, SSPS Train A MODE 1 Actuation Logic Test, Revision 4
OP-AA-102-1003, Guarded Equipment, Revision 6
WM-100-AA-1000, Work Activity Risk Management, Revision 4

Maintenance Orders/Work Orders
40212148 40339728 40339729 40339740 94124023

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
OP-AA-108-1000, Operator Challenges Program Management, Revision 1
OX1456.01, Charging Pump A & B Quarterly Flow And Valve Stroke Test And 18 Month Remote Position Indication Verification, Revision 19

Condition Reports

00001804	00008875	00054639	00068824	00091483	00101990
00164412	00169307	01656256	01713028	01934188	01934320
01936514	02033147	02056830	02060734	02065121	02065121
02069228	02069740	02070090	02070261	02074772	02076893

Miscellaneous

ASME Code for Operation and Maintenance of Nuclear Power Plants - 2004
Structural Calculation EM-33, Containment Enclosure Ventilation Building-Concrete, Revision 4
Technical Clarification TS-054

Drawings

1-NHY-310102, Sheet G18/2a, Diesel Generator 1B Governor Control, Revision 12
1-NHY-310102, Sheet G18/2b, Diesel Generator 1B Governor Control, Revision 2
1-NHY-310102, Sheet G18/2c, Diesel Generator 1B Legend and Switch Developments, Revision 11
1-NHY-310102, Sheet G18/2e, Diesel Generator 1B Governor Control, Revision 5
1-NHY-310102, Sheet G18/2e1, Diesel Generator 1B Governor Switch Development, Revision 1
9763-F-101620, Containment Enclosure Ventilation Area Concrete, Sheet 1, Revision 5

Section 1R18: Plant Modifications

Procedures

OX1402.02, CVCS Cold Shutdown and Refueling Interval Valve Test, Revision 12

Condition Reports

01715603	01715606	01748879	01754121	01797573	01800823
01808155					

Miscellaneous

50.59 Evaluation No. 12-001, Revision 0
Calculation # C-S-1-86211, Revision 0
EC 271261, RWST Valve Auto Open on VCT Valve Closure, Revision 7

Drawings

1-NHY-310891, Sh-B50d, CVCS TK-1 Outlet ISO VLV 1-LCV-112B Schematic Diagram, Revision 7
1-NHY-310891, Sh-B83d, CVCS TK-1 Outlet ISO VLV 1-LCV-112C Schematic Diagram, Revision 7
1-NHY-310891, Sh-B782, RWST-9 TO CHG PP ISO VLV 1-LCV-112D Schematic Diagram, Revision 13
1-NHY-503335, CS-RWST Make-Up Isolation Valves Logic Diagram, Revision 11
1-NHY-503341, CS-TK-1 Outlet Isol Valves Logic Diagram, Revision 10
1-NHY-506288, CS-RWST Make Up Isolation Valves Control Loop Diagram, Revision 10

Section 1R19: Post-Maintenance Testing

Procedures
IS0603.005, Equipment Operation for ASCO Solenoid Valves, Revision 11
IS0603.058, NAMCO Quick Connect Environmental Seal Maintenance, Revision 9
IS1628.300, CBA-P-5311 Control Building Mechanical Room/Atmosphere Differential Pressure Calibration, Revision 6
LX0557.03, Thermal Overload Protection Relay Replacement for Motor Operated Valves, Revision 12
ON1061.07, SEPS Maintenance Run, Revision 5
OS1023.51, Control Room Ventilation and Air Conditioning System Operation, Revision 22
OX1423.28, Control Room Air Conditioning System Quarterly Surveillance, Revision 5
OX1426.16, DG1A Tech Spec Action Statement Surveillance, Revision 12
OX1426.27, DG1B Semiannual Operability Surveillance, Revision 22
OX1456.91, Main Steam System Valve Operability Tests, Revision 8
OX1461.05, SEPS Annual Availability Surveillance, Revision 6

Condition Reports

01837698	02060729	02061205	02067725	02067726	02068574
02068644	02068675	02068683	02069228	02069235	02070463

Maintenance Orders/Work Orders

40302255	40310426	40310426	40333080	40338221	40338284
40338288	40339015	40339019	40344532	40346940	40346953
40346955	40346973	40346974	40346975	40353703	40369758
40405749	40408585				

Miscellaneous
FIP Team Basis for Operability White Paper, dated 8/29/2015

Drawings
1-NHY-310102, Sheet G18/2e, Diesel Generator 1B Governor Control Schematic Diagram, Revision 5
1-NHY-310841, Sheet E2T/10a, MS Atmos Relief Valve 1-PV-3003, Revision 8

Section 1R22: Surveillance Testing

Procedures
IX1656.941, NI-N-41 Power Range NI Operational Test and Overpower Trip High Range Bistable Adjustment, Revision 11
OS 1001.04, RCS Unidentified Leak Rate Action Level Exceedance, Revision 2
OX 1401.02, RCS Steady State Leak Rate Calculation, Revision 9

Condition Reports

01815099	02039374	02039388	02064662	02065119	02065512
02069214	02074115				

Maintenance Orders/Work Orders
40341690

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures
HD095817, Performance of Routine Radiological Surveys, Revision 13
HN0960.10, Radiological Requirements for Entry beneath Reactor Vessel, Revision 30
HN0960.17, Radiological Controls for Transfer of Spent Fuel Between the Containment and the Spent Fuel Pool, Revision 4
OA 13-007 Pre-Planned Posting and Survey Instructions, Revision 0
RP-AA-102-1000, Alpha Monitoring, Revision 2
RP-AA-102-1001, Area Radiological Surveys, Revision 1
RP-AA-103-1001, Posting Requirements for Radiological Hazards, Revision 2
RP-AA-103-1002, High Radiation Area Controls, Revision 3
RP-AA-107-1001, Radioactive Material Receipt, Revision 2
RP-AA-107-1003, Unconditional and Conditional Release of Material, Revision 1
TR-AA-112, Fleet Radiation Protection Training Program, Revision 0

Condition Reports

02016497	02016649	02021413	02028142	02031098	02035559
02040148	02042230	02042647	02053876	02060073	02060309
02066724	02067590	02068572	02069337		

Miscellaneous
HD0958.19 Form A, Dosimetry Abnormality Occurrence Report for CR 02035559, April 23, 2015
HSYD999 Free Release Items from RCA, Survey No. 20150922-2, September 22, 2015
RP-AA-103-1002-F-12, LHRA In-Service Key Box Log, September 22, 2015

Section 2RS2: Occupational ALARA Planning and Controls

Procedures
OS1090.08, Miscellaneous System and Component Flushes, Revision 5
RP15.4, Use and Control Temporary Shielding, Revision 12
RP-AA-104, ALARA Program, Revision 2
RP-AA-104-1000, ALARA Implementing Procedure, Revision 5

Condition Reports
02072258 02075752

Miscellaneous
ARB2015-01, ALARA Review Board Meeting 15-01, March 19, 2015
ARB2015-02, ALARA Review Board Meeting 15-02, June 5, 2015
ARB2015-03, ALARA Review Board Meeting 15-03, September 11, 2015
RP-AA-104-1000 Form 2 Pre-Job ALARA Review 15-14, Replace 24 Fixed Incore Detectors, August 31, 2015
RP-AA-104-1000 Form 2 Pre-Job ALARA Review 15-13, Mechanical Stress Improvement Process, August 31, 2015
RP-AA-104-1000 Form 2 Pre-Job ALARA Review 15-01, Reactor Vessel Disassembly and Reassembly, August 31, 2015
RP-AA-104-1000 Form 2 Pre-Job ALARA Review 15-02, OR 17 Steam Generator Eddy Current Testing, August 31, 2015

Section 2RS7: Radiological Environmental Monitoring Program

Procedures

CDI-015, Sampling of Groundwater Monitoring Wells, Revision 4
CP10.1, Radiological Surveillance and Quality Control Program, Revision 1
CP 4.1, Effluent Surveillances Program, Revision 30
EV-AA-100-1001, GWPP Implementing Guideline, Revision 2
EV-AA-104, Radiological Environmental Monitoring Program, Revision 1
EV-AA-207, Radiological Environmental Sampling of GW, Revision 1
HD0956.03, Radiological Environmental Sampling of Groundwater, Revision 6
HD0957.01, Calibration Environmental Air Samples, Revision 8
HD095704, Maintenance Environmental Sample Pump Motor, Revision 10
HX0956.01, Radiological Environmental Sampling of Air Particulates and Radio-iodine, Revision 13
HX0956.04, Radiological Environmental Sampling of Food Crops and Vegetation, Revision 11
HX0956.05, Radiological Environmental Sampling of Milk, Revision 12
IN0654 550, Met System Checks, Revision 8
IX0654.500, Met System Calibration, Revision 13
JD0999.401, Site Area Monitoring Program, Revision 5
JX0999.400, Environmental Monitoring of Direct Radiation, Revision 3

Condition Reports

01883144	01889749	01891515	01893359	01898882	01925714
02001910	02014355	02032066			

Maintenance Orders/Work Orders

40314609	40314611	40330264

Miscellaneous

2013 Seabrook Station Annual Radiological Environmental Operating Report, April 28, 2014
2014 Seabrook Station Annual Radiological Environmental Operating Report, April 23, 2015
AR 00213052-05, Asset Management Plan Seabrook Nuclear Station Buried and Underground Piping and Tank Integrity Program, Revision 0
AREVA Document No.32-9228760-000, 2014 Seabrook Land Use Census Analysis, September 23, 2014
Environmental Dosimetry Company Quality System Manual, August 1, 2012
Environmental Dosimetry Company, Annual Quality Assurance Status Report, January – December 2014, March 18, 2015
GL-QS-B-001, GEL Laboratories, LLC Quality Assurance Plan, Revision 29
HD0957.01 Form A, Environmental Air Sampler Calibration Record for DGM No 13014901, March 5, 2015
HD0957.01 Form A, Environmental Air Sampler Calibration Record for DGM No. 14779960, March 5, 2015
HD0957.01 Form A, Environmental Air Sampler Calibration Record for DGM No. 13528044, March 5, 2015
HD0957.01 Form A, Environmental Air Sampler Calibration Record for DGM No. 14779959, March 5, 2015
HPSTID 15-003 Historical Site Radiological Assessment 01/01/2014 through 12/31/2014, April 15, 2015

Normandeau Associates, Seabrook Environmental Studies – Quality Program and Standard Operating Procedures, Revision 12
Normandeau Associates, Inc., QA Audit Report for Seabrook Station REMP Program Surface Water Collection, August 14, 2014
NUPIC Vendor Audit 23724, GEL Laboratories, LLC, Charleston, SC, June 6, 2014
SB ODCM, Revision 37
SB UFSAR Ch 2 A and B Onsite Meteorological Data
SBK-013, Nuclear Oversight Audit Report Chemistry and Effluents, February 5, 2015

Section 4OA1: Performance Indicator Verification

Miscellaneous
Engineering Evaluation SBK-PRAE-15-001, Seabrook Mitigating System Performance Indicator Basis Document, Revision 0
LIC-15015, Documentation Supporting the Seabrook Station NRC 1st Quarter 2015 Performance Indicator Submittal
NEI 99-02, Regulatory Assessment performance Indicator Guideline, Revision 7

Section 4OA2: Problem Identification and Resolution

Procedures
IS1642.954, FP-CP-376 Containment Fire Detection Sensitivity Test, Revision 7
MX0599.06, 6-Month Surveillance and Post-Maintenance Inspection of Technical Requirements Fire-Rated Doors, Revision 7
OS1200.00, Response to Fire or Fire Alarm Actuation, Revision 22

Condition Reports

01902434	01962559	01974828	01986871	01992175	01992974
01992976	01993127	01993129	01993401	01994135	02041550

Maintenance Orders/Work Orders

40267238	40278968	40291925	40311482	40335896	40339300
40339346	40339378	40339379	40340623		
40340646					

Miscellaneous
AR 00213052-05, Asset Management Plan - Buried & Underground Piping & Tanks Integrity Program, Revision 0
Fire Protection Evaluation and Comparison to BTP APCSB 9-5-1, Appendix A, Revision 13A
Maintenance Rule Functional Failure Evaluation of 1-FP-8043-001, dated 6/26/14
Quality Assurance Topical Report (FPL-1), dated 6/15
Technical Requirements Manual, Revision 144
UFSAR Section 9.5.1, Fire Protection System, Revision 16

Drawings
304118-FP4492R-02, 1-PB-021-EV101-7504 Penetration Seal Design, Revision 2
304118-FP4635P-02, MF-003-MF303-1503 Penetration Seal Design, Revision 1
304502-FP4138R-01, MF-003-MFST1-7101 Penetration Seal Design, Revision 0
FP-B20274, Fire Protection Yard Piping, Revision 19
MFW-201, Main Steam & Feedwater Building Electric Tunnel Floor Plan, Revision 0

MFW-202, Main Steam & Feedwater Building Electric Tunnel Sections, Revision 0
NHY-504709 Sht. 2, FP-CP-378 Primary Auxiliary Building Fire Detection Panel, Revision 1
NHY-506474, Digital Fire Detection Control Loop Diagram, Revision 14

LIST OF ACRONYMS

ACE	apparent cause evaluation
ADAMS	Agencywide Document Access and Management System
ALARA	as low as reasonably achievable
CAP	corrective action program
CFR	*Code of Federal Regulations*
CLB	current licensing basis
CR	condition report
CT	cooling tower
EDG	emergency diesel generator
MR	maintenance rule
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	offsite dose calculation manual
OWA	operator workaround
PAB	primary auxiliary building
REMP	radiological environmental monitoring program
RG	Regulatory Guide
RWST	refueling water storage tank
SEPS	supplemental emergency power system
SSC	structure, system, and component
SSPS	solid state protection system
SW	service water
TRM	technical requirements manual
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
WO	work order