



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

May 14, 2018

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

**SUBJECT: SEABROOK STATION, UNIT NO. 1 – INTEGRATED INSPECTION REPORT
05000443/2018001**

Dear Mr. Nazar:

On March 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Seabrook Station, Unit No. 1 (Seabrook). On April 26, 2018, the NRC inspectors discussed the results of this inspection with Mr. Christopher Domingos, Site Director, and other members of the licensee staff. The results of this inspection are documented in the enclosed report.

The inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy.

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

If you contest the violation or significance of the non-cited violation, 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; and the NRC Resident Inspector at Seabrook.

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

Sincerely,

/RA/

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

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

Enclosure:
Inspection Report 05000443/2008001

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SUBJECT: SEABROOK STATION, UNIT NO. 1 – INTEGRATED INSPECTION REPORT
05000443/2018001 DATED MAY 14, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 50-443

License Number: NPF-86

Report Number: 05000443/2018001

Enterprise Identifier: I-2018-001-0049

Licensee: NextEra Energy Seabrook, LLC (NextEra)

Facility: Seabrook Station, Unit No. 1 (Seabrook)

Location: Seabrook, NH

Inspection Dates: January 1, 2018 to March 31, 2018

Inspectors: P. Cataldo, Senior Resident Inspector
P. Meier, Resident Inspector
D. Beacon, Acting Resident Inspector
J. Furia, Senior Health Physicist
N. Floyd, Reactor Inspector

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

SUMMARY

The NRC continued monitoring NextEra's performance at Seabrook by conducting the baseline inspections described in this report in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

A licensee-identified non-cited violation is documented in report Section 71111.15.

PLANT STATUS

Seabrook Station began the inspection period operating at 100 percent rated thermal power. There were no operational power changes of regulatory significance for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures in effect at the beginning of the inspection unless otherwise noted. Currently approved inspection procedures with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>.

Samples were declared complete when the inspection procedure requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather (1 sample)

The inspectors evaluated readiness for impending adverse weather conditions for a winter storm on January 3 and 4.

71111.04 - Equipment Alignment

Partial Walkdown (4 samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) 'B' emergency diesel generator alignment with 'A' emergency diesel generator inoperable for testing on January 16
- (2) 'A' emergency diesel generator alignment with the 'B' emergency diesel generator inoperable for relay maintenance and testing on January 30
- (3) 'A' residual heat removal system with 'B' residual heat removal system out of service on February 27
- (4) 'B' safety injection with 'A' safety injection out of service on March 20

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection (5 samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Turbine building 75' elevation (TB-F-3-0) on March 8
- (2) 'A' emergency diesel generator room (DG-F-2A-A) on March 15
- (3) 'B' emergency diesel generator (DG-F-2B-A) on March 15
- (4) 'A' emergency diesel generator silencer room (DG-F-3E-A) on March 16
- (5) 'B' emergency diesel generator silencer room (DG-F-3F-A) on March 16

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated licensed operator requalification training, in accordance with 10 CFR 55.59, at Seabrook on February 5, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated the following:

- (1) Reactor coolant system dilution activity; alarm response procedure implementation; and, briefing for engineered safety features actuation system slave relay testing on January 11
- (2) Fast start of the 'B' emergency diesel generator; procedure compliance and alarm response procedure implementation; technical specification entries for off-site power and emergency diesel generator technical specification acceptance criteria; and, turbine voltage adjustment on January 30
- (3) Completion of 24 hour emergency diesel generator loaded run and hot restart; procedure compliance and alarm response procedure implementation on January 31
- (4) Quarterly control rod surveillance testing; abnormal operating procedure entry for misaligned control rod; technical specification entries for misaligned control rod; briefs and crew updates for activities surrounding misaligned control rod; and, alarm response for emergent station air compressor auto-start due to system demand on March 12
- (5) Brief for 'B' condensate pump start after maintenance; expected and unexpected alarm response procedure implementation; and, normal operating procedure implementation for pump start on March 29

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Evaluation of safety-related relay maintenance and replacement schedules associated with the emergency diesel generators, following the failure of a commercially-dedicated CR-120BC relay and subsequent 10 CFR Part 21 report submittal in March 2018.

- (2) 'B' emergency diesel generator lube oil filter and strainer high differential pressure troubleshooting on February 5

71111.13 - Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Winter storm/grid vulnerability on January 3 and 4
- (2) 'D' atmospheric dump valve and 'B' emergency diesel generator maintenance on January 30
- (3) 'A' vital battery disconnect and effects on emergency power sequencer on February 12
- (4) Switchyard activities and 'A' emergency diesel generator activities on February 13
- (5) Safety Injection activities and entry into Independent System Operator – New England Master/Local Control Center procedure No. 2 on March 20 and 21

71111.15 - Operability Determinations and Functionality Assessments (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Supplemental emergency power system cooling water leak on January 2
- (2) Instrumentation seal table recurrent leak at location J-11 discovered on January 24
- (3) Misaligned shutdown bank 'E' rod, H4, following rod operability testing on March 12
- (4) Structural evaluation of seven safety-related electrical manholes on March 21
- (5) Emergency diesel generator operability following Part 21 report on CR120B relay bench test failures on March 22
- (6) 'B' residual heat removal heat exchanger component cooling vent line weld evaluation in March 2018

71111.18 - Plant Modifications (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Replacement of 'A' emergency diesel generator idle operate Agastat time-delay relay with an upgraded timing relay, under engineering change No. 289875, on February 13
- (2) Temporary modification to re-position 'A' steam generator steam supply condensing pot vent valve, MS-V-299, under engineering change No. 290828, on March 20

71111.19 - Post Maintenance Testing (6 Samples)

The inspectors evaluated post maintenance testing for the following maintenance/repair activities:

- (1) 'A' battery charger repair on January 2 and 3
- (2) 'B' containment enclosure cooling fan, 1-EAH-FN-5B, planned maintenance on January 10
- (3) Diesel fire pump 20B corrective maintenance on January 25
- (4) 'B' emergency diesel generator synchronizing relay replacement on January 30

- (5) Primary component cooling water isolation from residual heat removal heat exchanger 'B' valve, 1-CC-V-272, environmental qualification maintenance and testing on March 6
- (6) 'B' emergency diesel generator voltage transducer replacement on March 27

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (5 Samples)

- (1) 'B' emergency safety features actuation system testing under OX1456.64 on January 11
- (2) 'B' emergency diesel generator 24 hour load test and hot restart surveillance on January 30 and 31
- (3) Quarterly containment spray pump operability testing under OX1406.02 on March 9
- (4) Quarterly control and shutdown rod operability testing under OX1410.02 on March 12
- (5) Dose equivalent iodine chemistry sampling and analysis on March 20

In-service (1 Sample)

- (1) 'B' safety injection containment isolation valve quarterly stroke test surveillance on February 9

71114.06 - Drill Evaluation

Emergency Planning Drill (1 Sample)

The inspectors evaluated the conduct of a routine, full participation emergency planning drill No. 18-01 on February 14.

Drill/Training Evolution (1 Sample)

The inspectors evaluated the emergency planning aspects of a licensed operator annual simulator evaluation conducted in the Unit 1 plant-reference simulator on February 5. This evaluation included the initiation conditions and reporting requirements that resulted in associated emergency classification and notifications in accordance with prescribed procedures of the NextEra emergency plan.

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

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.

71124.02 - Occupational As Low As Reasonably Achievable Planning and Controls

Radiation Worker Performance (1 Sample)

The inspectors observed radiation worker and radiation protection technician performance during radiological work to evaluate worker as low as reasonably achievable performance according to specified work controls and procedures.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification (3 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period January 2017 through December 2017:

- (1) Unplanned scrams per 7000 critical hours
- (2) Unplanned power changes per 7000 critical hours
- (3) Unplanned scrams with complications

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Review of Alkali-Silica Reaction Impact on Concrete Structures

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated response to the following events:

- (1) Response to a seismic event on February 15, in accordance with abnormal operating procedure OS1200.04, and engineering evaluation of structures and equipment under ES1802.001

INSPECTION RESULTS

Licensee-Identified Non-Cited Violation	IP 71111.15
<p>This violation of very low safety significant was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.</p>	
<p>Violation: Title 10 CFR Part 50, Appendix B, Criterion III, Design Control, requires, in part, that measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.</p> <p>Contrary to the above, from an unknown date until January 10, 2018, NextEra did not have a measure for verifying the adequacy of design of seven safety-related electrical manholes. Specifically, there were no original calculations to support the design of the manholes; and when NextEra staff reconstituted the structural design calculation, the results concluded that four of the seven manholes would not meet the design specification unless the loading demands were reduced from 500 to 200 pounds per square foot.</p> <p>Significance/Severity Level: Green because all four structures remained capable of performing their safety function.</p> <p>Corrective Action References: AR 02243800 and AR 02255652</p>	

Observations	71152 Follow-up of Selected Issues
<p>The NRC performed a periodic site visit to Seabrook Station to review NextEra's monitoring of alkali-silica reaction (ASR) on affected reinforced concrete structures, per their 10 CFR 50.65 "Maintenance Rule" Structures Monitoring Program, and NextEra's corrective action process. The inspectors verified on a sampling basis that significant changes or different presentations of ASR on the affected structures were appropriately considered for impact on the existing Seabrook prompt operability determinations for the affected structures. In addition, the inspectors performed independent walkdowns of ASR-affected areas; and reviewed reports of recently collected measurement data, including combined crack index, in-plane expansion, and extensometers, to verify that the structures were well within the established acceptable monitoring parameters.</p> <p>Based on the results of calculations conducted to evaluate the future impact of ASR on the reinforced concrete structures, the containment enclosure ventilation area (CEVA) North wall and the 'B' electrical tunnel were identified to not qualify (i.e., demand vs. capacity) in accordance with structural design code ACI 318-71, "Building Code Requirements for Reinforced Concrete." These results were previously documented in the NRC's fourth quarter integrated inspector report, IR 05000443/2017004 (ADAMS Accession Number ML18043A821). The inspectors performed a review to follow-up on NextEra's corrective actions associated with these two structures.</p> <p>NextEra staff identified remediation methods and planned actions to ensure the long-term structural performance of the CEVA North wall. The inspectors reviewed the draft engineering change package that outlined the conceptual repairs to the wall. The inspectors noted that NextEra staff were still in the design phase. The NRC will review the final design package</p>	

once it has been completed, including the actual implementation of the structural modification. The inspectors reviewed the January 2018 lateral displacement measurements to verify the structure maintained its structural stability and noted that there had been no apparent changes in the displacement since the previous measurements taken in October 2017.

For the 'B' electrical tunnel, NextEra staff revised the methodology used to determine the ASR loading from the concrete backfill on the electrical tunnel wall, and concluded that this reanalysis would fully qualify the structure in accordance with ACI 318-71 structural design code. NextEra plans to provide this revised methodology to the NRC as a supplement to License Amendment Request 16-03, dated August 1, 2016. Examination of NextEra's methodology for analyzing seismic Category I structures with concrete affected by ASR is currently under review by the NRC. The inspectors performed an independent walkdown of the electrical tunnel and did not observe any indications of loading distress or other structural integrity issues as evident by the absence of structural flexure cracks. NextEra staff planned to perform more frequent inspections of the electrical tunnel and to predevelop a modification package in the event that cracking is identified.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On March 22, 2018, the inspectors presented the Problem Identification and Resolution annual sample (71152 (1)) inspection results to Larry Nicholson, Director of Nuclear Licensing & Regulatory Compliance, and other members of NextEra staff.
- On March 29, 2018, the inspectors presented the radiation safety inspection results to Ms. T. Smith, Radiation Protection Manager, and other members of the licensee staff.
- On April 26, 2018, the inspectors presented the quarterly resident inspector inspection results to Mr. Christopher Domingos, Site Director, and other members of the licensee staff.

DOCUMENTS REVIEWED**7111.15 - Operability Determinations and Functionality Assessments**Condition Reports (*initiated in response to inspection)

IR 01664399

Engineering Evaluations

FP101201, Evaluation of Seismic Category I Electrical Manholes – Stage 1, Revision 0

FP101202, ASR Inspections of Electrical Manholes W01, W02, W09 and W13 through W16,
Revision 0Miscellaneous

SD-66, Structural Design Criteria, Revision 2

71152 - Problem Identification and ResolutionCondition Reports (*initiated in response to inspection)01664399 02014325 02193235 02210951 02215578 02240426
02227250Engineering Evaluations

FP101193, Evaluation of Containment Enclosure Ventilation Area (CEVA) Bowing, Revision 0

Miscellaneous

Extensometer Data of through Thickness Expansions, dated March 19, 2018

FP101203, 2017 Tier 2 Inspections – ASR Inspections and Cracking Index Measurements on
Concrete Structures, Revision 0FP101204, 2017 Tier 2 Inspections – Measurements for ASR Expansion on Concrete
Structures, Revision 0

Structures Monitoring Program Manual, Revision 4