



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

August 9, 2012

Mr. Kevin Walsh
Site Vice President
Seabrook Nuclear Power Plant
NextEra Energy Seabrook, LLC
c/o Mr. Michael O'Keefe
P.O. Box 300
Seabrook, NH 03874

**SUBJECT: SEABROOK STATION, UNIT NO. 1 - NRC INTEGRATED INSPECTION
REPORT 05000443/2012003**

Dear Mr. Walsh:

On June 30, 2012, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at Seabrook Station, Unit No. 1. The enclosed inspection report documents the inspection results, which were discussed on June 28, 2012, with you and other members of your staff.

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

Based on the results of this inspection no findings were identified.

In accordance with 10 CFR 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the

NRC's document 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/

Arthur L. Burritt, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000443/2012003
w/ Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-443

License No.: NPF-86

Report No.: 05000443/2012003

Licensee: NextEra Energy Seabrook, LLC

Facility: Seabrook Station, Unit No.1

Location: Seabrook, New Hampshire 03874

Dates: April 1, 2012 to June 30, 2012

Inspectors: W. Raymond, Senior Resident Inspector
J. DeBoer, Acting Resident Inspector
K. Dunham, Reactor Engineer
J. Noggle, Sr. Health Physicist
T. Ziev, Reactor Engineer
T. O'Hara, Reactor Inspector
T. Burns, Reactor Inspector

Approved by: Arthur Burritt, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000443/2012003; 04/01/2012 - 06/30/2012; 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 4, dated December 2006.

No findings were identified

REPORT DETAILS

Summary of Plant Status

Seabrook operated at 85% power from the start of the period until April 20, 2012, and at 45% power from April 20 to April 25 during repairs on the B main feed water pump controls. On April 25, following completion of repairs operators restore the plant to 85% power where it remained for the rest of the period. On June 13, 2012, operators responded to an ammonia hydroxide spill in the stock room of the site administrative building. The spill resulted in the declaration of a Notice of Unusual Event because the toxic gases released were deemed detrimental to normal operation of the plant. More details for this event are discussed in Section 4OA3 of this report.

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R01 Adverse Weather Protection (71111.01 – 3 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of NextEra's readiness for the onset of seasonal high temperatures. The review focused on ventilation and emergency diesel generators (EDGs). The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure NextEra's personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including NextEra's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

During the week of May 14, 2012, the inspectors performed an inspection of the external flood protection measures for Seabrook. The inspectors reviewed the UFSAR, Chapter 2.4., Hydrologic Engineering, which depicted 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 all external areas of the plant, including the turbine building, auxiliary building, and the switchyard 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.

.3 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed NextEra's procedures affecting these areas and the communications protocols between the transmission system operator and NextEra. This review focused on changes to the established program and material condition of offsite alternate AC power equipment. When required, 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 responsible NextEra personnel, reviewing condition reports and open work orders, and walking down portions of the offsite and alternate AC power systems including the 345 kilovolt (KV) switchyard.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 5 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- B emergency feed water (EFW) with A EFW out of service, May 8, 2012
- B service water (SW) train during planned maintenance on A SW train, May 16-17, 2012
- A EFW with B EFW out of service, May 22, 2012
- A EDG during planned maintenance activities on the B EDG on May 1, 2012
- B EDG following restoration from maintenance on May 7, 2012

The inspectors selected these systems based on their risk-significance for the current plant configuration or following realignment. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field

walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors performed a complete system walkdown of accessible portions of the containment building spray (CBS) system to verify the equipment lineup was correct for the period May 7, 2012 through May 9, 2012. The inspectors reviewed operating procedures, drawings, equipment lineup procedures, system health reports and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability 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 properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure NextEra appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 3 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.

- B EDG Building on April 27, 2012
- Fuel storage building on May 7, 2012
- B essential switchgear room on May 9, 2012

1R07 Heat Sink Performance (711111.07T – 2 samples)

a. Inspection Scope

Based on a plant specific risk assessment, past inspection results, recent operational experience, and resident inspector input the inspectors selected and completed the following heat sink and heat exchanger samples.

Heat Sink Sample – Service Water System

The inspectors conducted a walkdown of the Service Water (SW) system intake structure and observed the functioning of the traveling screens and strainers. Also, the inspectors observed that the condition of SW pumps and SW piping supports was not visibly degraded. Additionally, the inspectors verified that SW pump bay silt accumulation is monitored, trended, and maintained at an acceptable level. The inspectors verified that SW pump bay water level instruments are functional and are routinely monitored.

The inspectors reviewed the planned SW piping design change that will replace the original, cement-lined SW piping with piping made from AL-6XN stainless steel to be implemented during the next few refueling outages. The inspectors reviewed several recently completed repairs on service water piping leaks identified during system engineer walkdowns. See Section 4OA2.3 of this report and Report 05000443/2011005, Section 4OA7, for further NRC reviews of SW pipe coating performance.

The inspectors reviewed four recent action reports (AR) that reported through-wall leaks on SW piping. The inspectors verified disposition of these ARs included appropriate inspections and engineering evaluations (American Society of Mechanical Engineers (ASME) Code Case N-513) which concluded that continued operation with appropriate visual re-inspection during operation was justified.

The inspectors reviewed procedure OS1216.01 Degraded Ultimate Heat Sink, which governs SW system malfunctions and provides reference to other operating procedures for use when SW instrumentation does not function.

The inspectors reviewed how NextEra monitors the clean condenser pressure for changes caused by temperature variations to determine when microbiological fouling is occurring.

The inspectors reviewed NextEra's Engineering Evaluation 88-008 that evaluated the adequacy of SW pump minimum flow and verifies that Seabrook SW pumps are not subject to strong-pump weak-pump interaction.

The inspectors conducted a walkdown of the accessible equipment of the Seabrook SW system including the intake structure, traveling screens, SW pumps and strainers, primary component cooling water heat exchangers and significant portions of the associated (above-ground) piping. Also, the inspectors conducted a walkdown of the cooling tower.

NextEra is in the process of establishing a buried piping monitoring program. NextEra conducts ASME, Section XI, IWA-5244 pressure testing on all buried SW piping to provide reasonable assurance of the structural integrity of the piping. The inspectors

reviewed documentation of recently completed successful testing of both the A and B SW trains. NextEra uses system engineer walkdown inspections (visual) to detect coating defects and corrosion on above-ground SW piping.

The inspectors reviewed recent SW pump surveillance tests for the four SW pumps for vibrational monitoring and collection of flow data, in order to meet the specified performance criteria.

The inspectors reviewed the SW system adverse weather condition action which consists of more frequent operation and cleaning of the SW traveling screens when directed by the operations severe weather abnormal procedure.

Unit 1 Primary Component Cooling Water Heat Exchanger 1-CC-17- B

The inspectors reviewed NextEra's use of the temperature ratio monitoring method to measure the performance of the 1-CC-17-B heat exchanger, which is described in Seabrook Engineering Procedure ES1850.017 and in Electric Power Research Institute (EPRI) NP-7552, Heat Exchanger Performance Monitoring Guidelines.

The inspectors verified that test conditions (e.g., differential temperatures, differential pressures, and flows) were consistent with the selected methodology. The inspectors also verified that test acceptance criteria (e.g., fouling factors, heat transfer coefficients) were consistent with the design basis values. [The tubes in 1-CC-17-B have not shown any fouling and, thus, NextEra has not been able to calculate a fouling factor for the heat exchanger.] The inspectors verified that because of the relatively low normal operational heat load on this heat exchanger NextEra is not able to test the heat exchanger at the design basis heat load. The inspectors determined that the frequency of testing based on trending of test results is sufficient to detect degradation prior to loss of heat removal capability below design basis values. Also, the inspectors verified that NextEra's test procedure accounts for test instrument inaccuracies and uncertainties.

The inspectors reviewed work orders used to inspect and clean heat exchanger 1-CC-17-B. Heat Exchanger 1-CC-17-B is a relatively new (1997) unit and contains inconel tubes. NextEra has experienced very low levels of silting resulting in very infrequent cleanings. There have been two tubes plugged in heat exchanger 1-CC-17-B, both of which were installed during the manufacturing process. Inspection and cleaning activities have established acceptance criteria, and are consistent with industry standards. Also, as found results are recorded, evaluated, and appropriately dispositioned such that the as-left condition is acceptable.

The inspectors reviewed NextEra's use of eddy current inspection on approximately 1200 tubes of Heat Exchanger 1-CC-17-B during each refueling outage, which includes: 1) a tube inspection sample scope that is changed each outage to inspect previously uninspected tubes; and, 2) visual inspections of the exterior of the heat exchanger and operational pressure testing of the heat exchanger after each inspection.

The inspectors verified that the condition and operation of Heat Exchanger, 1-CC-17-B are consistent with the design assumptions in heat transfer calculations, and as described in the final safety analysis report. The inspectors' review included: 1) Thermal-Hydraulic analysis J-2552 to verify the adequacy of controls and operational limits to prevent heat exchanger degradation due to excessive flow induced vibration during operation and to verify that the number of plugged tubes; 2) pre-established limits, heat transfer capacity, and design heat transfer assumptions; and, 3) evaluation of

the potential for water hammer in order to determine that the potential is acceptably low for the design flow rates and operating pressures.

Review of Corrective Action Reports

The inspectors selected and reviewed a sample of corrective action program reports (ARs) related to the Unit 1 SW system, buried piping and heat exchangers. The review verified that NextEra was appropriately identifying, characterizing, and correcting non-conforming conditions related to these systems and components, and that the planned or completed corrective actions for the reported issues were appropriate.

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on June 21, 2012, which included a generator stator cooling failure with a dropped control rod and a steam generator tube rupture and the failure of select components to automatically start as required. 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 technical specification action statements entered by licensed operations personnel. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed the down power from 85 percent power to 45 percent power for repairs on the B main feed pump on April 20, 2012. The inspectors observed power accession evolutions from 45 percent power to 85 percent power following this maintenance activity on April 25, 2012. The inspectors observed operator performance during service water system surveillance testing on May 17, 2012, and service water system operations on the cooling tower on May 31, 2012. The inspectors observed reactivity control and conduct of operations in the control room and verified all actions were in accordance with NextEra's Conduct of Operations procedure OP-AA-100-1000,

Revision 5. Additionally, the inspectors observed operator performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure that NextEra was identifying and properly evaluating performance problems within the scope of the maintenance rule. As applicable, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by NextEra staff was reasonable; for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2); and, the inspectors independently verified that appropriate work practices were followed for the SSCs reviewed. Additionally, the inspectors ensured that NextEra staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- CS-01 Charging System in a(1) status for Maintenance Rule
- CB-01 Control Building Structure Maintenance Rule (a)(1) Improvement Plan

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. As applicable for each activity, the inspectors verified that NextEra personnel performed risk assessments as required by 10 CFR 60.65(a)(4) and applicable station procedures, 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 to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Planned venting and maintenance on the A condenser pump on April 5, 2012
- Planned maintenance associated with power supplies and controls for the B main feed pump on April 21, 2012
- Planned maintenance associated with switchyard work on the 363 line concurrent with planned maintenance and surveillance testing on A SW on May 16-17, 2012
- Planned maintenance on station emergency power supply and switchyard line 363 outage on May 21, 2012
- Planned switchyard maintenance for breaker 22, which used a crane in the switchyard from June 5-25, 2012

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 8 samples)

a. Inspection Scope

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

- CR1746851, service water system leak indications during ground water sampling from well SD6, March 20, 2012
- CR 1756199, main steam isolation valve MSD-V45 in a configuration that did not conform with the environmental qualification file, April 17, 2012
- CR1761442, fixed incore detector system non-conforming analytical method, May 1, 2012
- CR1699636, fire protections system safe shutdown limitations due to smoke propagation, May 11, 2012
- CR 1737117, safety injection valve SI-V82 potential susceptibility to stress corrosion cracking, May 14, 2012
- CR01773859, B Electrical Tunnel elevated temperatures due to HVAC not functional on June 12, 2012
- CR01777013, charging system oil high particulate level on June 17, 2012
- CR01777769, 120 Vac vital instrument bus PP1F normal AC power supply failure on June 20, 2012

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification 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 technical specifications and UFSAR to NextEra's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by NextEra. The inspectors determined, where appropriate, compliance with assumptions in the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

.1 Permanent Modifications

a. Inspection Scope

The inspectors evaluated design change package EC 249338, "Containment Isolation Indication Enhancements," that enhanced the main control room indications for the containment isolation system. 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 replacement of 61 status indicator light lenses. The inspectors also reviewed revisions to the control room alarm response procedure and interviewed engineering and operations personnel to ensure the procedure could be reasonably performed.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 samples)

a. Inspection Scope

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

- B emergency diesel generator (EDG) disassembly for crankcase web deflection measurements on April 30, 2012
- B EDG upper cylinder liner and piston inspections on May 1, 2012
- B EDG emergency power sequencer power supply replacement for overvoltage protection on May 1, 2012
- B EDG air start check valve DG-V260B replacement on May 2, 2012
- B EDG generator brush repairs on May 3, 2012
- B EDG jacket water temperature control valve repair on May 3, 2012
- B EDG generator planned governor repairs on May 4, 2012
- B EDG speed control circuit emergent governor maintenance on May 6, 2012

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, 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:

- B train emergency power sequencer test on May 1, 2012
- A train SW quarterly pump and discharge valve test on May 17, 2012
- Electric driven B EFW operability test on May 22, 2012
- 1B EDG monthly operability surveillance on May 29, 2012
- Incore power distribution analysis on June 1, 2012

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness1EP6 Drill Evaluation (71114.06 – 1 sample).1 Emergency Preparedness Training Observationa. Inspection Scope

The inspectors observed a simulator training evolution for Unit 1 licensed operators on June 21, 2012, 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 simulated 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 emergency response performance and ensure that NextEra evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

This area was inspected during the period May 14, 2012, through May 18, 2012, to verify NextEra is assuring the accuracy and operability of radiation monitoring instruments that are used to protect occupational workers and to protect the public from nuclear power plant operations. The inspectors used the requirements in 10 CFR Part 20, 10 CFR Part 50 Appendix A - Criterion 60 Control of Release of Radioactivity to the Environment and Criterion 64 Monitoring Radioactive Releases, 10 CFR 50, Appendix I, Numerical Guides for Design Objectives and Limiting Conditions for Operation, to meet the Criterion "As Low as is Reasonably Achievable for Radioactive Material in "Light-Water – Cooled Nuclear Power Reactor Effluents, 40 CFR Part 190 Environmental Radiation Protection Standards for Nuclear Power Operations, NUREG 0737 Clarification of Three Mile Island Corrective Action Requirements, the Technical Specifications/Offsite Dose Calculation Manual, applicable industry standards, and NextEra's procedures required by technical specifications as criteria for determining compliance.

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the Final Safety Analysis Report to identify radiation instruments associated with monitoring area radiation, airborne radioactivity, process streams, effluents, materials/articles, and workers. Additionally, the inspectors reviewed the associated technical specification requirements for post-accident monitoring instrumentation. The inspectors reviewed a listing of in-service survey instrumentation including air samplers and small article monitors, along with radiation monitoring instruments used to detect and analyze workers' external contamination as well as, external dose. Additionally, the inspectors reviewed personnel contamination monitors and portal monitors including whole-body counters to detect workers' surface and internal contamination. The inspectors assessed whether an adequate number and type of instruments were available to support operations.

The inspectors reviewed licensee and third-party evaluation reports of the radiation monitoring program since the last inspection including evaluations of offsite calibration facilities or services, if applicable.

The inspectors reviewed procedures that govern instrument source checks and calibrations, focusing on instruments used for monitoring transient high radiological conditions, including instruments used for underwater surveys. The inspectors reviewed the calibration and source check procedures for adequacy. The inspectors reviewed the area radiation monitor alarm setpoint values and bases as provided in the technical specifications and the final safety analysis report.

The inspectors reviewed effluent monitor alarm setpoint bases and the calculation methods provided in the offsite dose calculation manual.

b. Findings

No findings were identified.

.2 Walkdowns and Observations

a. Inspection Scope

The inspectors walked down three effluent radiation monitoring systems, including at least one liquid and one gaseous effluent system. Focus was placed on flow measurement devices and all accessible point-of-discharge liquid and gaseous effluent monitors. The inspectors assessed whether the effluent/process monitor configurations align with what is described in the FSAR and offsite dose calculation manual.

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

The inspectors observed licensee staff performance as the staff demonstrated source checks for five different types of portable survey instruments. The inspectors assessed whether high-range instruments are source checked on all appropriate scales.

The inspectors walked down five area radiation monitors and three continuous air monitors to determine whether they were appropriately positioned relative to the radiation sources or areas they were intended to monitor. Selectively, the inspectors compared monitor response (via local readout or remote control room indications) with actual area radiological conditions for consistency.

The inspectors selected three personnel contamination monitors, portal monitors, and one small article monitors and evaluated whether the periodic source checks were performed in accordance with the manufacturer's recommendations and licensee procedures.

b. Findings

No findings were identified.

.3 Calibration and Testing Program

a. Inspection Scope

Process and Effluent Monitors

The inspectors selected seven effluent monitor instruments and evaluated whether channel calibration and functional tests were performed consistent with Technical Specifications/Offsite Dose Calculation Manual. The inspectors assessed whether; (a) NextEra calibrated its monitors with National Institute of Standards and Technology traceable sources; (b) the primary calibrations adequately represented the plant nuclide mix; (c) when secondary calibration sources were used, the sources were verified by comparison with the primary calibration source; and (d) NextEra's channel calibrations encompassed the instrument's alarm set-points.

The inspectors assessed whether the effluent monitor alarm setpoints are established as provided in the offsite dose calculation manual and station procedures.

For changes to effluent monitor setpoints, the inspectors evaluated the basis for changes to ensure that an adequate justification exists.

Laboratory Instrumentation

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

The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded performance.

Whole Body Counter

The inspectors reviewed the methods and sources used to perform functional checks on the whole body counters before daily use and assessed whether check sources were appropriate and align with the plant's isotopic mix.

The inspectors reviewed calibration records for the whole body counters since the last inspection and evaluated whether calibration sources were representative of the plant radionuclide mix and that appropriate calibration phantom(s) were/was used. The inspectors looked for anomalous results or other indications of instrument performance problems.

Post-Accident Monitoring Instrumentation

Inspectors reviewed the calibration documentation for the containment high-range monitors.

The inspectors assessed whether an electronic calibration was completed for all range decades and were also calibrated using an appropriate radiation source.

The inspectors assessed whether calibration acceptance criteria are reasonable, considering the large measuring range and the intended use of the instrument.

The inspectors selected two effluent/process monitors that are relied on by NextEra in its emergency operating procedures as a basis for triggering emergency action levels and subsequent emergency classifications, or to make protective action recommendations during an accident. The inspectors evaluated the calibration and availability of these instruments.

The inspectors reviewed NextEra's capability to collect high-range, post-accident effluent samples.

As available, the inspectors observed electronic and radiation calibration of those instruments associated with the post accident effluent sampling to verify conformity with NextEra's calibration and test protocols.

Portal Monitors, Personnel Contamination Monitors, and Small Article Monitors

The inspectors selected one of each type of these instruments and verified that the alarm setpoint values are reasonable under the circumstances to ensure that licensed material is not released from the site.

The inspectors reviewed the calibration documentation for each selected instrument and reviewed the calibration methods to determine consistency with the manufacturer's recommendations.

Portable Survey Instruments, Area Radiation Monitors, Electronic Dosimetry, and Air Samplers/Continuous Air Monitors

The inspectors reviewed calibration documentation for at least one of each type of portable instrument. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods and reviewed the use of its instrument calibrator as applicable.

As available, the inspectors selected one portable survey instrument that did not meet acceptance criteria during calibration or source checks to assess whether NextEra had taken appropriate corrective action for instruments found significantly out of calibration (greater than 50 percent). The inspectors evaluated whether NextEra had evaluated the possible consequences associated with the use of an instrument that is "out-of calibration" since the last successful calibration or source check.

Instrument Calibrator

The inspectors reviewed the current radiation output values for NextEra's portable survey and area radiation monitor instrument calibrator unit. The inspectors assessed whether NextEra periodically verifies calibrator output over the range of the exposure rates/dose rates using an ion chamber/electrometer.

The inspectors assessed whether the measuring devices had been calibrated by a facility using National Institute of Standards Technology (NIST) traceable sources and whether decay corrective factors for these measuring devices were properly applied by NextEra in its output verification.

Calibration and Check Sources

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

b. Findings

No findings were identified.

.4 Problem Identification and Resolution

a. Inspection Scope

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

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 2 samples)

.1 Reactor Coolant System (RCS) Leak Rate

a. Inspection Scope

The inspectors reviewed NextEra's submittal for the RCS leak rate performance indicators for Unit 1 for the period of April 30, 2011 through May 1, 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed RCS sample analysis and logs of daily measurements of RCS leakage, and compared that information to the data reported by the performance indicator.

b. Findings

No findings were identified.

.2 RCS Specific Activity

• Inspection Scope

The inspectors reviewed NextEra's submittal for the RCS specific activity performance indicators for Unit 1 for the period of October 30, 2011, through June 30, 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed RCS sample analysis and logs of daily measurements of RCS activity, and compared that information to the data reported by the performance indicator.

• Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that NextEra entered issues into the corrective action program 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 corrective action program and periodically attended condition report screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by NextEra outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed NextEra's corrective action program database for the first and second quarters of 2012 to assess condition reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed the NextEra quarterly trend report for the first quarter of 2012, conducted under PI-AA-207 to verify that NextEra personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

The inspectors did not identify any trends that NextEra had not identified. The inspectors reviewed issues and events that occurred over the past four quarters that were documented in the corrective action program. The inspectors verified that NextEra appropriately considered identified issues as emerging trends, and in some cases, verified the adequacy of the actions completed or planned to address the identified trends.

The inspectors evaluated a sample of departments that are required to provide input into the quarterly trend reports, which included operations, maintenance and engineering departments. This review included a sample of issues and events that occurred over the course of the past two quarters to determine whether issues were appropriately considered or ruled as emerging or adverse trends, and in some cases, verified the appropriate disposition of resolved trends.

The inspectors verified that issues were addressed within the scope of the corrective action program, or through department review and documentation in the quarterly trend report for overall assessment. For example, the inspectors noted that consistent with the occurrence of secondary system problems that have occurred over the past several months and the ongoing challenges posed to plant operations, NextEra personnel had appropriately identified "system health status degradation" as a negative trend in equipment reliability (ARs 1737104 and 1736974). In other cases, NextEra personnel had appropriately identified an adverse trend in DEP indicator (drill and exercise performance) opportunities and initiated a common cause evaluation (AR1724741). The inspectors verified for resolved trends, such as mispositioned components, that applicable success criteria identified to ensure successful resolution of adverse trends had been appropriately dispositioned. The inspectors noted an apparent trend indicated by NRC findings concerning issues screened in accordance with 10CFR 50.59. This matter was discussed at the exit interview.

.3 Annual Sample: Service water system internal protective coating degradation

a. Inspection Scope

A PI&R sample inspection was conducted during the period May 14, 2012 through May 17, 2012, of the service water system (SW) related to internal protective coating degradation due to blistering, cracking and loss of adhesion to the inside diameter of the carbon steel piping. This condition was identified as a result of visual inspections of the piping inside diameter performed at various locations in response to AR 01667856 which noted degraded Service Water (SW) flow through the train B Diesel Generator heat exchanger during weekly surveillance testing in July 2011.

The purpose of this inspection was to assess the problem identification, resolution and corrective actions taken by NextEra to characterize, correct and prevent reoccurrence of potential problems that could impact cornerstone objectives.

b. Findings and Observations

No findings were identified. The root cause evaluation and corrective actions were reasonable, appropriate and timely.

The inspectors evaluated the threshold for problem identification, the adequacy of cause analysis, extent of condition review, cooling water (CW) and SW operability and reportability determinations, timeliness and effectiveness of corrective actions.

The inspectors reviewed NextEra's root cause evaluation (RCE) which addressed the long history of SW degradation (corrosion/erosion) resulting in wall thinning and pressure boundary penetration and some leakage. The area of wall thinning has been associated with locations where there has been loss of protective coating and/or liner

failure. The inspectors observed that NextEra performed a RCE since the EDG heat exchangers provide the safety-related function of transferring heat from the Diesel Generator (DG) Cooling Water System to the Service Water System.

The inspectors observed that the root cause team concluded that there were two root causes for this event:

1. A “limited life” design change (“Plastisol” material having an estimated 15 year service life) was implemented in 1994 with no provisions for formally tracking the periodic verifications of the material condition of the coating.
 - The individuals involved with developing, approving and implementing this design change did not establish a formal tracking mechanism for the periodic verification of the material condition of the coating.
2. Oversight of the SW system was not adequate due to lack of compliance with the system Plant Engineering Guideline (PEG) requirements which would have provided test results that would reveal that deterioration was underway of the Plastisol lining on the inside diameter of piping and components.
 - The system engineer (SE) did not recognize PEG requirement for the periodic examination of the Plastisol lining which was a limited life protective measure.
 - No inspections were performed in OR10, OR11, OR12, OR13, and OR14, which resulted in a delay in the formulation of a long range replacement plan to assure continued system function and component integrity.
 - The long term strategy for the system conflicted with PEG and GL 89-13.
 - The preventative maintenance process was not utilized for tracking PEG required inspections.

The inspectors examined several portions of failed lining removed from the SW system piping. The removed samples provided evidence of loss of coating adhesion with subsequent corrosive/erosive attack of the carbon steel pipe. The inspectors observed that NextEra had performed examination using ultrasonic testing (UT) at selected locations of disruptive flow patterns where loss of adhesion and base metal attack was most likely. The results of testing identified areas exhibiting various stages of wall thinning. The inspectors verified the areas of wall thinning measured confirmed that the wall loss did not result in a violation of ASME Code requirements that assure system integrity.

The inspectors reviewed NextEra's additional “extent of condition” examinations to identify the loss of protective coating and potential wall thinning of the susceptible carbon steel piping and components. The inspectors reviewed examination and test procedures, qualifications of non-destructive test personnel and test results to verify compliance with the ASME Code and that results support the past and current system operability until the scheduled outage (OR15) in the fall of 2012. The inspectors observed that the susceptible material is scheduled for replacement with material that is more resistant to corrosion and/or erosion by salt water, in the fall of 2012 outage.

The inspectors visually examined the inside and outside surfaces of several samples of replacement pipe and fittings to assess welding workmanship. Also, the inspectors reviewed the results of Calculation C-S-1-45867, which was prepared to support that the existing pipe and fitting wall thicknesses were sufficient to support system operability until scheduled replacement.

The inspectors verified the following corrective actions had been completed within the assigned due dates:

1. Revision of the North Atlantic Design Control Manual (NADC) to include the requirement to utilize the Preventive Maintenance (PM) process for inspections and replacement activities. (CA-34)
2. Establish a process that requires monitoring and inspection programs comply with system PEGs and that long term strategies comply with regulatory commitments. (CA-35, 39 and 40)
3. Identify and evaluate similar protective coatings that have service life limits and initiate corrective actions to determine the extent of condition and perform periodic verification of the material condition of coatings. (CA-37)

The inspectors also reviewed additional action request (AR) and condition reports that were initiated and identified as applicable to the degradation of the SW system.

The inspectors verified that additional corrective actions were initiated for the development and/or revision of system engineer turnover which will include a review of commitments, design and other basis documents (e.g., GL 89-13, DCR 93-003). (CA-43)

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

.1 Plant Events (1 sample)

a. Inspection Scope

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

- Notice of Unusual Event (NOUE) due to Chemical Spill declared at 1343 on June 13, 2012. Seabrook declared a NOUE due to a release of toxic gases deemed detrimental to normal operation of the plant. A worker in the stock room of the site's administrative building spilled about 1 quart of ammonium hydroxide. The initial air samples in the stock room were 80 ppm and adjacent areas had no detectable ammonia. When the spill was reported to the control room Operators entered abnormal procedures for a chemical spill. The NOUE was declared consistent with

the associated note in the EAL for entry into an abnormal operating procedure. The NOUE was exited several hours later after the spill was contained.

b. Findings

No findings were identified.

4OA5 Other Activities

Institute of Nuclear Power Operations (INPO) Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment of Seabrook conducted in November 2011. The inspectors also reviewed the final report for the INPO accreditation team evaluation of the maintenance, chemistry, and radiological protection technical training programs conducted in March 2011. The inspectors reviewed these reports to ensure that any issues identified were consistent with NRC perspectives of NextEra performance and to determine if INPO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On April 19, 2012, inspectors presented the triennial heat sink performance inspection results to Mr. Thomas Vehec, Plant General Manager, 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.

On June 30, 2012, the inspectors presented the inspection results to Mr. K. Walsh, 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

V. Brown, Senior Licensing Engineer
D. Flaherty, Radiation Protection Manager
S. Fournier, Mechanical Design Engineer
A. Giotas, Chemistry Supervisor
R. Guthrie, RMS System Engineer
D. Master, Structures Monitoring Engineer
D. McGonigle, Design Engineering
B. McAllister, Buried Piping & Service Water System Engineer
M. O'Keefe, Licensing Manager
K. Parenti, Engineering Technical Lead
D. Robinson, Chemistry Manager
M. Scannell, Radiation Protection Technical Specialist
G. Sessler, Heat Exchanger Program Engineer
R. Sterritt, ALARA Coordinator
T. Vehec, Plant General Manager
T. Waechter, Nuclear Plant Shift Manager
D. Yates, Service Water System Engineer

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

None

Opened

None

Closed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

MA 4.10 Control of Temporary Equipment, Temporary Power, Job Setup and Plant Storage, Revision 12
ON1490.09 Summer Readiness Surveillance, Revision 06
OP-AA-102-1002 Seasonal Readiness, Revision 0
OS1246.02, Degraded Vital AC Power (Plant Operating), Revision 11

Condition Reports

01757125, 01758933, 01771371

Maintenance Orders/Work Orders

WO 40105552

Miscellaneous

Technical Specifications 3.7.6
Technical Specifications 3.7.5.1
Technical Specifications 3.9.12
UFSAR Section 2.4 Hydrologic Engineering
UFSAR Various

Section 1R04: Equipment Alignment

Procedures

OS1426.18, Aligning DG 1A Controls for Auto Start, Revision 3
OS1426.19, Aligning DG 1B Controls for Auto Start, Revision 3
OS1026.12, Operating DG 1B Starting Air System, Revision 12
OX1406.12, 18 Month Containment and Containment Spray Recirculation Sump Surveillance, Revision 8
OX1406.01, Monthly CBS Train A and B Valve Verification, Revision 6
OX1416.07, Monthly Service Water Valve Verification, Revision 9
OX.1436.03, Electric EFW Pump Quarterly, 18 Month/30 Days Cold Shutdown and Comprehensive Pump Tests, and Monthly Valve Verification Surveillance, Revision 16

Condition Reports:

01756723, 01747728, 01731545

Maintenance Orders/Work Orders:

WO 40117959, 40118785

Miscellaneous

Condition Report List
Daily Status Report
System Health Reports (CBS)
TS 3.6.2.1 Containment Spray System
TS 3.7.1.2 Auxiliary Feedwater System
TS Bases 3.6.2.1, Containment Spray System
Technical Specification - various

UFSAR Section 6.2 Containment Systems
UFSAR Section 6.8 Emergency Feedwater System
UFSAR Section 9.2.1 Service Water System
Work Order List

Drawings

1-FW-B20684
1-CBS-B20233, Containment Spray System
1-SW-B20794 / 20795

Section 1R05: Fire Protection

Procedures

OS1200.00A, Fire Hazards Analysis for Affected Area / Zone – Appendix A
FP 2.2, Control of Transient Combustible Materials, Revision 13

Condition Report

01757030, 01747964, 01683939, 00222865, 00160472

Miscellaneous

Fire Protection Manual, Revision 34
Maintenance Rule Performance Criteria, CS-01
Maintenance Rule Improvement Plan for Charging System AOV Tubing Failures, Rev 2
Pre-Fire Strategies, Revision 1
Systems Health Report, Charging System
TS 3.5 Charging Systems
Transient Combustible Materials Permit, CMP-12-3156
Transient Combustible Materials Permit, CMP-12-3220
UFSAR, Chapter 5, Reactor Coolant System and Connected Systems

Drawings

1-FSB-F-1-A, Fuel Storage Building
CB-F-1B-A, Control Building Switchgear Rooms Train "B"
DG-F-2B-A, DB-F-1B-A

Section 1R07: Heat Sink Performance

Procedures

NextEra Energy Process No. PI-AA-204, Revision 16; Condition Identification and Screening Process
NextEra Energy Process No. PI-AA-205, Revision 16; Condition Evaluation and Corrective Action
Plant Engineering Guidelines, Heat Exchanger and NRC 89-13 Program, PEG-268, Revision 00
Seabrook Station Engineering Procedure, SW Heat Exchanger Program, ES1850.017, Revision 00, Change 02

System Health Reports

Service Water System Health Report, 1st Quarter 2012
Service Water System Health Report, 4th Quarter 2011

Self-Assessments

2012 NRC Triennial Heat Sink Inspection Quick Hit Self Assessment, Seabrook Plant Engineering, 3/5 – 3/28/2012

Drawings & Sketches

Drawing 1-NHY-202476, Service & Circ. Water Pump House Plan & Section General Arrangement (FSAR Fig. 1.2-46)
Drawing 9763-F-202477, Public Service Co. of New Hampshire, Service & Circ. Water Pump House Plan below Grade General Arrangement (FSAR Fig. 1.2-47)
Drawing 9763-F-202478, Public Service Co. of New Hampshire, Service & Circ. Water Pump House Sections General Arrangement (FSAR Fig. 1.2-48)
Drawing 1-CL-B20680, FPL Energy Seabrook Station, Chlorination System Overview (FSAR Fig. 10-45)
Drawing 1-CC-B20209, NextEra Energy Seabrook Station, Primary Component Cooling Thermal Barrier Loop Detail
Drawing 1-SW-B20792, North Atlantic Energy Service; Service Water System Nuclear Overview
Drawing 1-SW-B20794, FPL Energy Seabrook Station; Service Water System Nuclear Detail
Drawing 1-SW-B20795, FPL Energy Seabrook Station; Service Water System Nuclear Detail

Licensing and Design Basis Documents

Seabrook Unit 1, Design Basis Document, Primary Component Cooling Water, Revision 4, 4/13/09

NDE Reports

Mistras, Inc.; Record of Eddy Current Inspection of Primary Component Cooling Water Heat Exchanger E-17A At NextEra Energy's Seabrook Nuclear Plant, Seabrook, NH, October 2009
Mistras, Inc.; Record of Eddy Current Inspection of Primary Component Cooling Water Heat Exchanger E-17B At NextEra Energy's Seabrook Nuclear Plant, Seabrook, NH, April 2005

Engineering Calculations, Analyses, Specifications, and Design Changes

Thermal-Hydraulic Analysis, J-2552; PCCW Heat Exchangers for Seabrook Nuclear Station; North Atlantic Energy Service Electric Corp., TM-1682, 9/27/96
C-S-1-28009, Revision 0, 2/9/04; Primary Component Cooling Water System Heat Loads and Flow Rates for Various Plant Operating Modes after SPU
DCR 96-016, Revision 1, PCCW Heat Exchanger Replacement, 1/28/97
United Engineers & Constructors Inc., 30 South 17TH Street, Philadelphia, Pennsylvania 19101, Specification for Primary Component Cooling Water Heat Exchangers for Public Service Company of New Hampshire Seabrook Station Unit Nos. 1 & 2, 6/9/81
Station Requirements for Primary Component Cooling Water Heat Exchangers, Specification: S-S-1-E-0073, Revision 4, 3/27/97
EC-270504 – Addition of seals into the SW system during OR14
EC-274623 – SW-P-110-B (AR01728295) Cooling Tower Pumps with a vibration history
EC-274172, Revision 001, OR15 SW Piping Modifications: Replacement of SW DGHX Piping and A PCCW Piping with AL-6XN material
Seabrook Station Engineering Procedure ES1810.302, Revision 00; Service Water Train B ISI System Leakage Test
Seabrook Station Engineering Procedure ES1810.301, Revision 00; Service Water Train A ISI System Leakage Test
Seabrook Station Engineering Procedure ES1809.001, Revision 06; Master Integrity Test Procedure
Seabrook Station Engineering Procedure ES1850.017, Revision 00, Change 02; SW Heat Exchanger Program

FPL Energy Seabrook Station, Detailed Systems Text, Circulating Water and Chlorination (CW), Revision 5
Seabrook Station License Renewal Project Technical Report, Intake and Discharge Tunnel, LRTR-IDT, Revision 0, 4/30/10
Plant Engineering Guidelines, Service Water Inspection and Repair Trending, PEG-94, Revision 02, 3/14/12
United Engineers Calculation, PSNH – Seabrook Station, 740-21, Circulating Water System Hydraulic Analysis
Public Service Company of New Hampshire, Seabrook Station, Units 1 & 2, Hydraulic Analysis of Circulating Water System J.O. 9763.008, 2/27/76 (Calc. Set No. 9763-102-740-21) Calculation 4.3.0872F, Revision 9, SW System Steady State Analysis, 9/30/11

Work Orders/Work Instructions

Work Order Package 01202862 01, 1-CC-E-17-B Tube Sheet Inspection, 4/21/11
Work Order 0641218, 1-CC-E-17B Tube Sheet Inspection, 4/18/08
Work Order Package 01167976 01, 1-CC-E-17-A Tube Sheet Inspection, 10/29/09
Work Order 0516811, 1-CC-E-17A Tube Sheet Inspection, 10/21/06
Work Order 0420431, 1-CC-E-17B Perform Eddy Current Testing Of Train “B” PCCW Heat Exchanger, 4/18/05
Work Order 0418675, 1-CC-E-17B Tube Sheet Inspection, 4/18/05
Work Order 0638849, Diving Inspection & Cleaning of Off-Shore Intake & Discharge Structures; completed on 4/15/08
Work Order Package 01170068 01; Service Water Train A ISI System Leakage Test, completed on 4/29/10
Work Order Package 40036570 01; Service Water Train B ISI System Leakage Test, completed on 4/29/10
Work Order Package 01202862 01; 1-CC-E-17-B Tube Sheet Inspection, completed on 4/21/11
Work Order Package 0641218; 1-CC-E-17-B Tube Sheet Inspection, completed on 4/18/08
Work Order Package 0420431; Perform eddy current testing on 1-CC-E-17-B, completed on 11/15/08
Work Order Package 0418675; Remove & reinstall “B” train SW inlet spool piece to HX 1-CC-E-17-B for tubesheet inspection, completed on 4/18/05
Work Order Package 40144909 01; Seabrook Service Test Train A, 2/9/12
Work Order Package 40144884 01; Seabrook Service Test Train B, 2/8/12
Work Order Package 0638849; 1-CW-off-Shore-Dive-RS-000, Diving Inspection & Cleaning of Off-Shore Intake & Discharge Structures (contains UCC Report), 3/6/08
Work Order Package 0737572; Perform ROV Inspection of CW Intake and Discharge Structures and Tunnels, 3/16/08

Corrective Action Documents (AR)

AR00209357, AR00392285, AR01636533, AR00209078, AR00199034, AR00199147, AR00206987, AR00207103, AR00207898, AR00208167, AR00209026, AR00210161, AR00210162, AR00579707, AR01603222, AR01645975, AR01668013, AR01673445, AR01674154, AR01677459, AR01682679, AR01682901, AR01696363, AR01696773, AR01696918, AR01746851, AR01755780*, AR01756370*, AR01756788*

* Written as a result of this NRC inspection

Miscellaneous Documents

ASME, Section XI, Subsection IWA 5244 Testing of buried Components
EPRI NP-5772, 12/91; Heat Exchanger Performance Monitoring Guidelines
NRC Generic Letter 89-13, Service Water System Problems Affecting Safety-Related
Equipment, 7/18/89
NRC Order EA-12-049, March 12, 2012: Subject: Issuance of Order to Modify Licenses with
Regard to Requirements Mitigation Strategies for Beyond-Design-Basis External Events
NRC Order EA-12-051, March 12, 2012; Issuance of Order to Modify Licenses with
Regard to Reliable Spent Fuel Pool Instrumentation

Section 1R11: Licensed Operator Requalification Program

Procedures

12-REOR-004, Reactor Engineering Operating Recommendation, Revision 03
OP-AA-100-1000, Conduct of Operations, Revision 5
ON 1035.10, Main Feed Pump Standby and Startup Operation, Revision 18
ON1231.01 Turbine Generator High Vibration, Revision 15
OS1000.05, Power Increase, Revision 24
OS1227.02 Steam Generator Tube Leak, Revision 18
OS1210.05 Dropped Rod, Revision 14
OX1416.04, Service Water Quarterly Pump and Discharge Valve Test and Comprehensive
Pump Test, Revision 14
Reactor Trip or Safety Injection, E-0, Revision 49
Steam Generator Tube Rupture, E-3, Revision 42
WM-AA-1000, Work Activity Risk Management, Revision 12

Maintenance Orders/Work Orders

WO 40119574

Section 1R12: Maintenance Effectiveness

Procedures

SGH 110594-SGH-Z004-11, Revision 1
Foreign Print 100647, SGH Z004-11, Crack Index Determination
MPR 0326-0058-06, Scope for Alkali-Silica Reaction Walkdowns
MPR-3704, Seabrook Station: summary of Alkali-Silica Reaction Walkdown Results

Condition Reports

00222005, 01650365, 01659623, 01682547, 1636419, 1687932

Maintenance Orders/Work Orders

WO 01757030, 01747964, 01683939, 00222865, 00160472, 40068220, 40089514, 40153209

Miscellaneous

Maintenance Rule (a)(1) Improvement Plan for Charging System AOV Tubing failures, Revision 02
Maintenance Rule Performance Criteria, CS-01
Maintenance Rule (a)(1) Improvement Plan for CB-01, DGB-01, EF-01, CE-01 and RV-01
Degradation of Concrete
System Health Report "Charging System"
Technical Specifications Section 3.5/4/5
USFAR Section 5 Reactor Coolant System and Connected Systems

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

ON 1034.03, Condensate System Operation, Revision 17
OP-AA-101-1000, Clearance and Tagging, Revision 3
WM-AA-1000, Work Activity Risk Management, Revision 12
WM-AA-1001, Look Ahead Process, Revision 1
WM-11.1, Protected Train and Guarded Equipment, Revision 15

Maintenance Orders/Work Orders

WO 40050731-01, 40068220, 40068391, 40089513, 40089514, 40091512-01, 40117959, 40118785, 40119564, 40119574, 40125873-01, 40125883-01, 40138722-01, 0154588-01, 40153209

Miscellaneous

Daily Status Report
Crane Operations a(4) Risk Assessment Instructions
M-Rule a(4) Risk Assessment Report for workweeks 1214-06, 1214-08, 1221-12
Operations Logs – various
Risk Assessment Report for workweek 1220-11
Technical Specifications Various
UFSAR various

Drawings

1-CO-B20423, Condensate System Detail

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

OS1247.02, Loss of 120 VAC Vital Instrument Bus PP1e pr PP1F, Revision 13
OS 1047.02, Transferring Power Supplies to 120 VAC Vital Instrument, Revision 8
OS1047.01, Vital Inverter Operation, Revision 14
OX1430.03, Main Steam Drain Valve Operability Tests, Revision 5
OX1456.39, Train A ESFAS Slave Relay K635 Quarterly Go Test, Revision 7

Condition Reports

01773859, 01773934, 01776750, 01777013, 01777769, 1761442, 1737117, 1699636, 1746851, 1756199

Maintenance Orders/Work Orders

WO 94947029

Miscellaneous

Circuit Failure Analysis, Distribution Panel No. EDE-PP-1F, Revision. 21
Daily Status Report
Functionality Assessment for AR1699636
RIS 2005-20, Operability Determinations and Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety
Simulate 3 Case Summary Data 1/6/10, 9/13/10, and 3/14/11
TS 3.5.2 “ECCS Subsystems”
TS 3.8.3 “Onsite Power Distribution”
Technical Requirements Manual TR24
UFSAR various

YAEC 1931, Seabrook Fixed Incore Detector System Extended Operation, February 1996
YAEC 1855PA, Seabrook Station Fixed Incore Detector System Analysis, October 1992

Drawings

Operator Aid #90-020, Inverter 1F, PP-1F Power Supplies
Drawings B20581, B20587, MSI 1-NHY-509048

Section 1R18: Plant Modifications

Procedures

EC249338, Containment Isolation Indication Enhancements, Revision 0

Condition Reports

0304132, 0304654, 0304142, 0304147, 0304148

Miscellaneous

10CFR50.59 Resource Manual
NUREG0737 supplement 1
Regulatory Guide 1.97, Revision 2

Section 1R19: Post-Maintenance Testing

Procedures

DG-OT015, Train B emergency Power Sequencer 18 month Operability Test
IS1605.312, 1-DGB-FY-AS-1 Air Start Solenoid Time Response Test, Revision 2
LX0589.04, 1B Diesel Generator Inspection, Testing and Preventive Maintenance, Revision 10
MS 0519.42, Robertshaw 3-Way Temperature Control Valve Maintenance, Revision 6
MX0539.50, Emergency Diesel Generator Engine 24-Month Preventive Maintenance, Revision 05
OS1426.25, Diesel Generator Cooling Water and Air Start Valve Surveillance, Revision 0

Maintenance Orders/Work Orders

01208316, 40063545, 40098844, 40098624, 40101996, 40101996-01, 40098615-01

Miscellaneous

GE Drawing, EGB-10P & 13P Oil Schematic
UFSAR Section 8.3 Onsite Power Systems

Drawings

1-DG-B20465 Diesel Generator Starting Air

Section 1R22: Surveillance Testing

Procedures

OX1416.04, Service Water Quarterly Pump and Discharge Valve Test and Comprehensive Pump Test, Revision 14
OX1436.03, Electric EFW Pump Quarterly Surveillance, Revision 16
OX1426.05, DG 1B Monthly Operability Surveillance, Revision 24

Condition Reports

01756720

Maintenance Orders/Work Orders

40098637, 40119551, 40119574, 40120756-01, 40122253

Miscellaneous

Operations Logs – various
Simulate 3 Case Summary Data 6/1/12 and 2/2/11
Technical Specifications – various
UFSAR Section 8.3 Onsite Power Systems
UFSAR Section 9 Water Systems

Drawings

1-FW-B20688, 1-SW-B20794/20795

Section 1EP6: Drill Evaluation

Procedures

OS1227.02, Steam Generator Tube Leak, Revision 18
OS1210.05, Dropped Rod, Revision 14
ON1231.01 Turbine Generator High Vibration, Revision 15
Reactor Trip or Safety Injection, E-0, Revision 49
Steam Generator Tube Rupture, E-3, Revision 42

Section 2RS5: Radiation Monitoring Instrumentation

Procedures:

CS0920.07, Tritium Analysis by Liquid Scintillation, Revision 14
HD0955.05, Operation of Portable Radiation and Contamination Survey Instruments, Revision 16
HD0955.19, Use of the Model 81 Shepherd Beam Irradiator, Revision 11
HD0955.31, Determination of Portable Instrument Response Check Data, Revision 3
HD0958.49, Response Protocol for Whole Body Counting and Personnel Contamination Monitoring, Revision 7
HD0961.31, Canberra Whole Body Counting System Operation, Revision 7
HD0961.34, Canberra Fastscan Whole Body Counting System Operation, Revision 4
HD0963.08, Calibration of Air Sampling Equipment, Revision 14
HD0963.61, Calibration and Maintenance of HD-29A and AVS-28A Air sample Pump and Motor
HPSTID 06-008, Verification of Model 81 Beam Irradiator, 2005
HPSTID 11-006, Calibration of Whole Body Counting Systems
HPSTID 11-014, Verification/Calibration on the Shepherd Model 81-12 Cs-137 Irradiator, 2011
HPSTID 92-009, Characterization of Model 81 Beam Irradiator
IX1660.720, COP Train A or B Radiation Monitor Calibration, Revision 6
IN1660.731, RM-R-6495 Plant Ventilation Mid/High Range Backup Radiation Monitor Calibration, Revision 2
IX1660.730, RM-R-6528 Plant Ventilation Wide Range Gas Radiation Monitor Calibration, Revision 5
IX1660.814, RM-R-6504 Waste Gas Compressors Discharge Radiation Monitor Calibration, Revision 6
IX1660.816, RM-R-6509 Waste Liquid Test Tanks Discharge Radiation Monitor Calibration, Revision 6
IX1660.801, RM-R-6481 or 6482 Main Steam Line Radiation Monitor Calibration, Revision 5
IN1660.992, Storm Drain Sample Line Radiation Monitor Calibration, Revision 2
JS0999.200, Operation of the Count Room Analysis System, Revision 3
JS0999.300, Calibration of Gamma Spectroscopy Detectors using the Count Analysis System, Revision 2

Condition Reports:

1737323, 1743682, 1744878, 1759231, 1760299, 1732271, 1752878, 1768107

Miscellaneous Documents:

2011 10 CFR Part 61 Waste Stream Analyses
Offsite Dose Calculation Manual, Rev. 36
Seabrook Nuclear Oversight Report No. SBK 12-002, Audit Radiological Protection and
Radwaste

Section 40A1: Performance Indicator Verification

Procedures

Inspection Manual Chapter 2515 Appendix D
Inspection Procedure 71111.22 Surveillance Testing
OX1401.02 RCS Steady Leak Rate Calculation, Revision 08
Technical Specifications 3.4.6.2

Miscellaneous

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6
LIC 11026, LIC 11036, LIC 12003, LIC 12021

Section 40A2: Problem Identification and Resolution

Procedures

PEG-208, Service Water System Performance Monitoring, Revision 1
PI-AA-204, Condition Identification and Screening Process, Revision 16
PI-AA-207, Trend Coding and Analysis, Revision 3

Condition Reports

01695393, 01695398, 01694951, 01667856, 01667857, 00028049, 01667857/01694951

Miscellaneous

2012 First Quarter Trend Reports
2012 First Quarter Trend Reports
CR01694951, Root Cause Evaluation of Plastisol Liner Delaminating in Train B Diesel
Generator Service Water Piping, Oct 10, 2011
EC-274172 R2 OR15SW Piping Modifications of SW DGHX (replace with AL6XN)
NRC Generic Letter 89-13
Operating Experience Summary – Plastisol Liner Delaminating in “B” Diesel Generator SW
Piping 10/10/2011
Prompt Operability Determination (CR 01667857)
SBK-L-12023 Response to Request for Additional Information 2/7/2012

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Condition Reports

1775907, 1775908

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low as is Reasonably Achievable
AR	Action Request
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CR	Condition Report
CW	Circulating Water
DG	Diesel Generator
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EC	Engineering Change
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
EPRI	Electric Power Research Institute
ESW	Emergency Service Water
FPL	Florida Power and Light
GL	[NRC] Generic Letter
HX	Heat Exchanger
KV	Kilovolt
IMC	Inspection Manual Chapter
IP	[NRC] Inspection Procedure
LER	Licensee Event Report
NIST	National Institute of Standards Technology
NRC	Nuclear Regulatory Commission
OR	Refuel Outage
PARS	Publicly Available Records
PCCW	Primary Component Cooling Water
PEG	Plant Engineering Guideline
PI	Performance Indicator
P&ID	Piping and Instrument Diagram
PI&R	Problem Identification and Resolution
PM	Preventative Maintenance
PRA	Probabilistic Risk Assessment
QA	Quality Assurance
RCE	Root Cause Evaluation
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDP	Significance Determination Process
SRI	Senior Resident Inspector
SW	Service Water/System Engineer
TI	Temporary Instruction
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
UT	Ultrasonic Testing
WO	Work Orders