

November 19, 2013

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

SUBJECT: SEABROOK STATION, UNIT NO. 1 - NRC INTEGRATED INSPECTION REPORT 05000443/2013004 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) REPORT NO. 07200063/2013001

Dear Mr. Walsh:

On September 30, 2013, 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 October 31, 2013, 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.

This report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance, and because it was entered into your corrective action program (CAP), the NRC is treating the finding as a non-cited violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Seabrook Station. In addition, if you disagree with the cross-cutting aspect assigned to the finding in this report, you should provide a response within 30 days of the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Seabrook Station.

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

Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <u>http://www.nrc.gov/reading-rm/adams.html</u> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

- Docket No: 50-443
- License No: NPF-86
- Enclosure: Inspection Report No. 05000443/2013004 w/ Attachment: Supplemental Information
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Docket No: 50-443 License No: NPF-86

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-443
License No:	NPF-86
Report No:	05000443/2013004
Licensee:	NextEra Energy Seabrook, LLC
Facility:	Seabrook Station, Unit No.1
Location:	Seabrook, New Hampshire 03874
Dates:	July 1, 2013 through September 30, 2013
Inspectors:	 P. Cataldo, Senior Resident Inspector M. Jennerich, Resident Inspector J. Gilliam, Acting Resident Inspector S. Barr, Senior Emergency Preparedness Specialist B. Dionne, Health Physicist S. Hammann, Senior Health Physicist J. Laughlin, Emergency Preparedness Inspector J. Rady, Reactor Inspector N. Floyd, Reactor Inspector H. Gray, Reactor Inspector
Approved by:	Glenn T. Dentel, Chief Reactor Projects Branch 3 Division of Reactor Projects

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SUMMARY

IR 05000443/2013004; 07/01/2013 – 09/30/2013; Seabrook Station, Unit No. 1; Operability Determinations and Functionality Assessments.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified one non-cited violation (NCV) of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

Cornerstone: Mitigating Systems

• <u>Green</u>. The inspectors identified an NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and an associated violation of technical specification (TS) 3.7.4, because NextEra did not follow the requirements of station procedure EN-AA-203-1001, "Operability Determinations/ Functionality Assessments." Specifically, NextEra did not properly evaluate and document an adequate basis for operability, when relevant information was available that would have challenged the "reasonable expectation of operability" threshold for a service water (SW) through-wall leak that degraded incrementally from weepage on August 7, 2013, to a significantly larger leak on August 28, 2013. NextEra completed a temporary non-code repair of the flaw with the installation of a weldolet on September 1, 2013, following NRC review and approval of a relief request. Additionally, under the corrective action process, NextEra completed apparent cause evaluations for the piping flaw, as well as engineering decision-making during the non-destructive examinations and evaluations, and are currently evaluating the fundamental issue of decision-making regarding TS operability and TS compliance.

This performance deficiency is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the prompt operability determination incorrectly concluded the "B" cooling tower (CT) SW header and the "B" SW (ocean) pumps were operable, but degraded, versus inoperable. IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and Exhibit 4, "External Events Screening Questions," were used to assess this issue and a detailed risk evaluation was completed. The inspectors assumed that functionality of the SW system, based upon the as-found wall thinning, would only be challenged when aligned to the cooling tower basin when the SW piping is subjected to a higher overall sytem pressure. This system configuration is used to mitigate a seismic event following the loss of the normal SW intake structure. Based on low probability of SW piping system failure due to a seismic event and the overall low likelihood of a seismic event of a magnitude sufficient to cause structure, system, and component (SSC) damage, this finding was determined to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of human performance associated with the decision making component because NextEra failed to use conservative assumptions in decision-making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate it is unsafe in order to disapprove the action. Specifically, NextEra personnel had not considered relevant information in the form of UT data and actual leak propagation to conclude that they no longer had "reasonable assurance of operability" and did not declare the "B" header of ocean and CT SW systems inoperable [H.1(b)]. (Section 1R15).

REPORT DETAILS

Summary of Plant Status

Seabrook operated at or near full power for the entire assessment period.

1. **REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 3 samples)

Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- "A" emergency diesel generator (EDG) with the supplemental emergency power system (SEPS) out of service (OOS) on July 9, 2013
- 4160 volt safety bus 5 electrical lineup during "B" EDG fast start surveillance on July 29, 2013
- "A" SW CT pump P-110A alignment during CT pump P-110B maintenance on August 28, 2013

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), TSs, work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether NextEra staff had properly identified equipment issues and entered them into the corrective action program (CAP) for resolution with the appropriate significance characterization. Documents reviewed for each section of this inspection report are listed in the Attachment.

Findings

No findings were identified.

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

Inspection Scope

On August 15 to 17, 2013, the inspectors performed a complete system walkdown of accessible portions of the SW CT system, to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings,

equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and WOs to ensure NextEra appropriately evaluated and resolved any deficiencies.

Findings

No findings were identified.

- 1R05 Fire Protection
- .1 <u>Resident Inspector Quarterly Walkdowns</u> (71111.05Q 6 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 OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Primary Auxiliary Building (PAB) primary component cooling water (PCCW) pump area PAB-F-2C-2 on July 12, 2013
- PAB-8, PAB-F-1A-Z on July 12, 2013
- Electrical tunnels "B" train ET-F-1B-A on September 11, 2013
- Electrical tunnels "A" train ET-F-1B-A on September 11, 2013
- Control room CB-F-3A-A on September 12, 2013
- Control room computer room CB-F-3C-A on September 12, 2013
- b. <u>Findings</u>

No findings were identified.

1R11 <u>Licensed Operator Requalification Program</u> (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 July 24, 2013, which included operator actions to mitigate a fire and resultant multiple spurious operations of plant equipment, as well as safe shutdown actions from the simulated control room. The

inspectors evaluated operator performance during the simulated event and verified completion of applicable 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 also observed an emergency classification made by the shift manager for the applicable event. Additionally, the inspectors assessed the ability of the training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed and reviewed the performance of primary component cooling water pump testing on July 22, 2013, startup feed pump testing on July 24, 2013, and control room activities during solid state protection system testing of reactor trip breakers on August 1, 2013. The inspectors evaluated operator performance relative to control board manipulations, response to off-normal conditions, and the use of operating procedures, and verified that all actions were in accordance with NextEra's Conduct of Operations procedure OP-AA-100-1000, Revision 10. The inspectors assessed the clarity and effectiveness of communications, use of error prevention techniques, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor.

b. Findings

No findings were identified.

1R12 <u>Maintenance Effectiveness</u> (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, CAP documents, maintenance WOs, and maintenance rule basis documents to ensure that NextEra was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, 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. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that NextEra staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Galvanic corrosion on SW piping (AR No. 01860763)
- MS-V-393 recurrent leakage (AR No. 01846345)

b. <u>Findings</u>

No findings were identified.

1R13 <u>Maintenance Risk Assessments and Emergent Work Control</u> (71111.13 – 4 samples)

a. Inspection Scope

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

- SEPS annual maintenance outage on August 20, 2013
- "B" residual heat removal testing causing "B" EDG to be inoperable on August 27, 2013
- "B" CT SW testing during component cooling system relay testing on September 3, 2013
- Emergency feed water (EFW) pump testing and switchyard maintenance on September 17, 2013
- b. <u>Findings</u>

No findings were identified.

1R15 <u>Operability Determinations and Functionality Assessments</u> (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or nonconforming conditions:

- 1C uninterrupted power supply breaker opened during EDG surveillance on July 16, 2013
- SW pump 41C high vibrations on July 24, 2013
- SW CT level indicator specific gravity error on July 31, 2013
- SW through-wall leak on "B" SW header on August 7, 2013 and August 20, 2013
- SW through-wall leak increase on "B" SW header on August 28, 2013
- Incore detector extension tubes with valves open on August 28, 2013

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

b. <u>Findings</u>

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and an associated violation of TS 3.7.4, because NextEra did not follow the requirements of station procedure EN-AA-203-1001, "Operability Determinations/ Functionality Assessments." Specifically, NextEra did not properly evaluate and document an adequate basis for operability, when relevant information was available that would have challenged the "reasonable assurance for operability" threshold for a SW through-wall leak that degraded incrementally from weepage on August 7, 2013, to a significantly larger leak on August 28, 2013.

<u>Description</u>. On August 7, 2013, NextEra personnel discovered a through-wall leak on a section of 24-inch bypass piping associated with the "B" train SW system strainer No. 11. In accordance with EN-AA-203-1001, "Operability Determinations/ Functionality Assessments," an immediate operability determination was performed that concluded the SW system was operable but degraded, with an estimated leak rate of 10 drops per minute (dpm), and within the CAP under action request (AR) No. 01895334. NextEra subsequently completed a prompt operability determination (POD), on August 8, 2013, which utilized American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," Section XI, Division 1, consistent with site procedures and NRC regulations. The POD documented the piping section had adequate structural integrity to meet code requirements, following the performance of volumetric examination of the flaw, through the use of ultrasonic testing (UT), performed in accordance with procedure ES1807.012, "Ultrasonic Thickness Measurements."

Additionally, the UT report was reviewed by Engineering based on the results of the flaw evaluation and concluded the flaw was stable and acceptable for continued service. The UT evaluation documented and characterized the flaw as exhibiting an "abrupt change in thickness from nominal...absent the normal intermittent thickness readings that are seen within flawed areas of SW piping." Because of this atypical result, the flaw was "conservatively bounded" by the inside piping surface UT signal loss, resulting in a flaw size of "...2.327-inches circumferentially by 1.50-inches axially with a remaining wall thickness of 0.00-inches..." The POD also concluded the observed leak rate was within design and licensing basis flow and leakage requirements, which supported the operable but degraded conclusion.

On August 20, 2013, NextEra personnel identified that the leak had degraded to an approximate leak rate of 90 dpm. The basis of operability, which was documented in AR

report No. 01898318, referred back to the August 8 POD, (performed under AR 01895334) and concluded the 90 dpm leakage value continued to be within the bounding design and licensing basis flow and leakage requirements. The operability basis was supported by a follow-up UT of the affected area, performed on August 21, which revealed essentially similar UT results. The evaluation summarized the flaw examination as follows:

"Based on the PAUT examination the flaws axial and circumferential dimensions are unchanged with no reportable thickness. However, the rapid change in the OD surface coupled with the lack of UT thickness data in the flawed area suggests that there is little remaining wall at this location. It is likely that the size of the through wall hole will rapidly increase to the full 1.5-inch by 2.367-inch dimension."

On August 28, 2013, during a planned performance of surveillance testing of a CT SW pump, NextEra identified that the leak had progressively worsened to an estimated 25 gallons per minute (gpm). Subsequent evaluations postulated that the additional SW header pressure during CT SW pump operation (66 psig versus nominal 48 psig) contributed to the degrading condition of the leak at the identified flaw location. NextEra installed a housekeeping patch to limit the impact of water spray, and instituted several corrective actions under AR No. 01900249, as well as the originating AR No. 01895334 and its associated POD, which had continued to govern the basis and continued reasonable assurance for operability, which included, for example, the formation of an Operational Decision-Making (ODM) team, and planning extent-of-condition piping inspections to meet Code Case N513-3 requirements.

Also, TS 3.7.4.d requires, in part, that with two loops (except two CT loops) inoperable, return at least one of the affected loops to OPERABLE status within 24 hours, or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours. Contrary to the above, between August 7, 2013, and September 1, 2013, when the weldolet repair was completed on the "B" SW header piping, one CT SW loop and one ocean SW loop were inoperable for greater than TS requirements, and therefore, is considered a TS-prohibited condition. Corrective actions included apparent cause evaluations to determine the cause of (1) the flaw on the "B" SW strainer bypass header and (2) the missed opportunities to identify the significance of the UT data, as well as the NRC-approved code relief that resulted in the temporary weldolet installed over the flaw area on the "B" SW strainer bypass header. NextEra entered these issues into their CAP as AR 01904703.

The inspectors assessed NextEra performance regarding the evaluation of the degrading and non-conforming condition, and concluded that all available information should have resulted in a determination by NextEra that the leak could propagate to the bounding geometry discussed in the UT reports to 1.5-inches circumferentially and 2.3-inches axially. Moreover, since flow through this 1.5-inch by 2.3-inch defect would result in leakage outside the current licensing and design bases of the plant, reasonable assurance of operability was no longer appropriate for the circumstances, and should have resulted in the "B" SW ocean and CT headers being declared inoperable.

As a result, the inspectors determined that the reasonable expectation of operability was no longer credibly assured based on the following factors:

- 1. The subject carbon steel (belzona-lined) piping was newly-installed on or about April 2011, with a nominal thickness of 0.375-inches. The leak in August 2013, directly indicates an average loss over the approximate 28 months of 0.160-inches/year, which far exceeded the corrosion rates of 0.030-inches/year utilized in the POD to justify continued operability;
- The actual, rapid leak propagation that occurred from 10 dpm on August 7, to 90 dpm on August 20, to 25 gpm (while running CT SW pumps) on August 28, and ultimately, the estimated 15 gpm with normal ocean SW pressures, indicated a flaw degradation that appeared to be consistent with the flaw evaluation conducted following the volumetric examinations;
- 3. The physical condition of the piping at the flaw location was characterized initially as "weepage," on August 7, followed by a "concavity" that appeared at the flaw location on August 20, and ultimately as a through-wall hole on August 28 with a resultant estimated leak rate of 25 gpm. This rapid deterioration of ASME Class 3 piping wall was also consistent with the flaw evaluation and volumetric examinations that predicted very little remaining material of a specific geometry;
- 4. Information regarding the leak-rate from a hole characterized in the flaw evaluation, i.e., bounded by "...2.327-inches circumferentially by 1.50-inches axially with a remaining wall thickness of 0.00-inches..." was not integrated into the evaluation under the POD regarding the reasonable expectation of operability. Moreover, when the bounding flaw size was used to determine potential leak rates using standard engineering equations, an approximate 570 gpm leak rate was calculated. This resultant leak rate was outside the Operability criteria established in the POD of (1) 137.25 gpm (excluding SW boundary valve leak-by) based on leakage criteria associated with UFSAR design basis values of CT inventory for a 7-day mission time without makeup, (2) 130 gpm available margin from calculations that address SW cooling the primary component cooling heat exchanger, and (3) 250 gpm available margin from calculations that address SW cooling the diesel generator heat exchanger; and
- 5. It was known that the rapid leak propagation occurred from 90 dpm to 25 gpm on August 28, during surveillance testing of CT pumps, which directly indicated that a 20 psig increase in fluid system pressures caused the rapid leak propagation. Coupled with the volumetric flow information that was also known, a direct challenge to the reasonable expectation of operability should have been identified, or, more directly, a recognition that for all specified safety functions and design basis mission times, further operability of the "B" SW header with a rapidly degrading pipe wall and increased leak rates, was not assured.

Subsequently, through discussions between the NRC and NextEra, on August 31, NextEra was granted relief to perform a temporary, non-ASME code repair to the SW piping through the installation of a weldolet assembly over the affected flaw area, in compliance with 10 CFR 50.55a(a)(3)(ii), and completed the repair efforts on September 1, 2013. Current NextEra planning includes replacement of the flaw area in the next refueling outage, and completion of corrective actions associated with a number of apparent cause evaluations and other associated activities. Analysis. The inspectors identified that NextEra did not follow the requirements of station procedure EN-AA-203-1001, "Operability Determinations/ Functionality Assessments." Specifically, NextEra did not properly evaluate and document an adequate basis for operability, when relevant information was available in the form of atypical UT data and assessment, and more importantly, the propagation of a SW leak from a flaw that occurred between August 7 and August 28, 2013. The characterization and assessment of the flaw through UT methods was consistent with the leak propagation that was subsequently observed. This information was available for utilization during the prompt operability determination process, and directly challenges the "reasonable expectation for operability" threshold for a SW through-wall leak. Specifically, EN-AA-203-1001 stipulates that determination of operability be based on "the licensee's reasonable expectation," from the evidence collected, that SSCs are operable and that the operability determination will support the expectation. This failure to consider all relevant information was reasonably within NextEra's ability to foresee and correct, and their failure to appropriately assess operability when a degrading or non-conforming condition was identified was a performance deficiency. This performance deficiency is more than minor, and considered a finding, because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the prompt operability determination incorrectly concluded the "B" CT SW header and the "B" SW (ocean) pumps were operable, but degraded, because they did not utilize appropriate rigor to determine that given the (1) UT information and assessment, (2) identified flaw size, and (3) actual leak propagation, the resultant information translated into potential leakage values would have yielded leak rates in excess of the operability limits established in NextEra's current licensing basis, and in some cases, inconsistent with design basis required boundary leakage values.

The inspectors and Region I Senior Reactor Analyst (SRA) used IMC 0609, "Significance Determination Process," Attachment 04, to perform the initial safety significance characterization of this finding. The inspectors assumed that functionality of the SW system, based upon the as-found wall thinning, would only be challenged when aligned to the cooling tower basin (higher suction pressure) and the SW piping is subjected to a higher overall system pressure. This system configuration is used to mitigate a seismic event following the loss of the normal SW intake structure. Accordingly, the inspectors used IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and Exhibit 4, "External Events Screening Questions," to assess this issue and conclude a detailed risk evaluation was warranted.

The SRA used insights from the Seabrook Updated FSAR and Seabrook Individual Plant Examination of External Events (IPEEE), as well as, the Risk Assessment Standardization Project (RASP) Handbook, Volume 2, to perform a qualitative assessment. The operating basis earthquake (OBE) and the safe shutdown earthquake (SSE) peak horizontal ground acceleration values are 0.125g and 0.25g, respectively. From IPEEE Table 3.2, "Seabrook Fragility Analysis: Seismic Capacity of Structures," and Table 3.3, "Seabrook Fragility Analysis: Equipment Fragilities," the seismic design capacities of the Service Water (SW) Pumphouse, SW Intake Structure, SW Cooling Tower, and SW piping are all built to withstand seismic events that exceed 2.0g. Based upon IPEEE, Figure 3-1, "Family of Seismic Hazard Curves for the Seabrook Site," the annual exceedance probability of an earthquake producing ground accelerations greater than 2.0g (of a magnitude sufficient to challenge the seismic capacity of the SW Intake Structure) is approximately 1.0E-07. Assuming an earthquake of this magnitude and the failure of the SW intake structure, it is likely the unit will be manually shutdown, if not automatically tripped, from the event. In conjunction with plant walkdowns to identify and assess SSC damage, operators would be tasked with aligning the service water suction to the cooling tower basin. Assuming worst case operator performance due to high stress and limited time available to restore service water cooling for decay heat removal and RCP seal cooling, the SRA assumed a one in ten probability of failure (to realign the SW system suction to the cooling tower basin). Lastly, the probability of a service water piping failure (rupture) due to the observed wall thinning cannot be accurately quantified, but under a worst case condition can assume to be 1.0. Therefore, the estimated increase in core damage probability associated with this performance deficiency is in the low 1.0E-08 range or very low safety significance (Green).

The finding has a cross-cutting aspect in the area of human performance associated with the decision making component because NextEra failed to use conservative assumptions in decision-making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate it is unsafe in order to disapprove the action. Specifically, NextEra personnel had not considered relevant information in the form of UT data and actual leak propagation to conclude that they no longer had "reasonable assurance of operability" and did not declare the "B" header of ocean and CT SW systems inoperable [H.1(b)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions or procedures, and shall be accomplished accordingly. NextEra's procedure EN-AA-203-1001, "Operability Determinations/ Functionality Assessments," requires in part, that a SSC remains operable until reasonable expectation of operability cannot be demonstrated, with specific focus on the ability of the SSC to perform its specified safety function. Contrary to the above, NextEra did not properly evaluate and document an adequate basis for operability, when relevant information from volumetric UT data was available that would have challenged the "reasonable assurance for operability" threshold for a SW through-wall leak that degraded incrementally from weepage on August 7, 2013, to a significantly larger leak on August 28, 2013. In addition, between August 7, 2013 and September 1, 2013, when the weldolet repair was completed on the "B" SW header piping, one CT SW loop and one ocean SW loop were inoperable for greater than TS 3.7.4.b. requirements, and therefore, is a TS-prohibited condition. NextEra entered this issue regarding the TS violation in the CAP, to evaluate the cause and to determine actions to prevent recurrence, as AR No. 01916618 and 01904703. Because this finding is of very low safety significance and was entered into NextEra's CAP, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000443/2013004-01, Inadequate Operability Determination Regarding Service Water Leakage and Associated TS Violation)

1R19 <u>Post-Maintenance Testing</u> (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.

- Reactor Coolant System (RCS) loop 1 T-hot card failure replacement on July 8, 2013
- "B" PCCW head tank level instrument reading erratically on July 10, 2013
- PCCW pump 11A relay replacement on July 24, 2013
- Electrical panel PP-1F breaker testing and replacement on July 31, 2013
- Reactor trip bypass breaker failed to close on August 1, 2013
- RH-FCV-616 positioner replacement on August 26, 2013
- SW CT "B" P-110B Agastat relay inspection on August 28, 2013
- "B" SW header leak repairs on September 1, 2013

b. Findings

No findings were identified.

- 1R22 <u>Surveillance Testing</u> (71111.22 8 samples)
 - a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and NextEra procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- SW CT level instrument calibration on June 27, 2013
- CT fan 51A relay calibration on July 18, 2013
- EFW OT019 startup feed pump quarterly surveillance on July 22, 2013
- P-506 turbine impulse pressure calibration on August 16, 2013
- RCS leak rate surveillance test on August 19, 2013
- EFW quarterly operability surveillance on August 23, 2013
- Containment building spray valve surveillance testing on August 29, 2013
- Turbine driven EFW pump operability surveillance on September 18, 2013

b. <u>Findings</u>

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 <u>Alert and Notification System Evaluation</u> (71114.02 – 1 sample)

a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the Seabrook Station Alert and Notification System (ANS). During this inspection, the inspectors conducted a review of the ANS testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency approved ANS Design Report to ensure compliance with design report commitments for system maintenance and testing. The inspectors toured the facility used by, and interviewed, the dedicated Seabrook staff responsible for the maintenance and testing of the Seabrook ANS. 10 CFR 50.47(b) (5) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 <u>Emergency Response Organization Staffing and Augmentation System</u> (71114.03 – 1 sample)

a. Inspection Scope

The inspectors conducted a review of the Seabrook Station Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of key licensee staff to respond to an emergency event and to verify NextEra's ability to activate their emergency response facilities (ERFs) in a timely manner. The inspectors reviewed the Seabrook Station Emergency Plan for ERF activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, the most recent drive-in drill report, and corrective action reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. Title 10 CFR 50.47(b) (2) and related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP4 <u>Emergency Action Level and Emergency Plan Changes</u> (71114.04 – 1 sample)

a. Inspection Scope

The Office of Nuclear Security and Incident Response staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and the Emergency Plan located under ADAMS accession number ML13225A386 as listed in the Attachment.

The licensee determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

b. Findings

No findings were identified.

1EP5 <u>Maintaining Emergency Preparedness</u> (71114.05 – 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of NextEra's efforts to maintain the Seabrook emergency preparedness (EP) program. The inspectors reviewed: Memorandums of Understanding with offsite agencies; the 10 CFR 50.54(q) Emergency Plan change process and practices; licensee maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary, backup, and alternate emergency response facility maintenance. The inspectors also verified NextEra's compliance at Seabrook with new NRC EP regulations regarding: emergency action levels for hostile action events; protective actions for on-site personnel during events; emergency declaration timeliness; ERO augmentation and alternate facility capability; evacuation time estimate updates; on-shift ERO staffing analysis; and, ANS back-up means.

The inspectors further evaluated NextEra's ability to maintain their EP program through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, actual event reports, self-assessments, 10 CFR 50.54(t) review reports, and EP-related CRs. The inspectors reviewed a sample of EP-related CRs initiated at Seabrook from January 2012 through July 15, 2013. The inspection was conducted in accordance with NRC Inspection Procedure 71114.05. Title 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. <u>Findings</u>

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

- 2RS7 Radiological Environmental Monitoring Program (71124.07)
 - a. Inspection Scope

During July 22 to 26, 2013, the inspectors verified that the radiological environmental monitoring program (REMP) quantifies the impact of radioactive effluent releases to the

environment and sufficiently validates the integrity of the radioactive gaseous and liquid effluent release program.

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; 10 CFR 50 Appendix I Numerical Guides for Design Objectives and Limiting Conditions for Operations to Meet the Criterion "As Low as is Reasonably Achievable" (ALARA) for Radioactive Material in Light-Water - Cooled Nuclear Power Reactor Effluents; 40 CFR Part 190 Environmental Radiation Protection Standards for Nuclear Power Operations; 40 CFR Part 141 Maximum Contaminant Levels for Radionuclides; the guidance in RGs 1.23 Meteorological Measurements Program for Nuclear Power Plants, RG 4.1 Radiological Environmental Monitoring Programs for Nuclear Power Plants; RG 4.15 Quality Assurance for Radiological Monitoring Programs; NUREG 1301 Offsite Dose Calculation Manual (ODCM) Guidance: Standard Radiological Effluent Controls; applicable industry standards; and licensee procedures as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the Seabrook Station Annual Radiological Environmental Operating Reports for 2011 and 2012, and the results of any licensee assessments since the last inspection to verify that the REMP was implemented and reported in accordance with the TSs and ODCM. This review included changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data.

The inspectors reviewed the Seabrook Station ODCM to identify locations of environmental monitoring stations. The inspectors reviewed the UFSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation. The inspectors reviewed quality assurance audits and technical evaluations performed on the associated vendor programs i.e., environmental dosimetry, analytical laboratory, marine sampling and radiological engineering services.

The inspectors reviewed the Seabrook Station Annual Radioactive Effluent Release Reports and the most recent results from waste stream analysis, to determine if NextEra is sampling and analyzing for the predominant radionuclides likely to be released in effluents.

Site/Environmental Inspection

The inspectors walked down five air sampling stations and five environmental dosimeter stations to determine whether they are located as described in the ODCM and to determine the equipment material condition.

For the air samplers and Thermoluminescent Dosimeter (TLD) stations selected, the inspectors reviewed the calibration and maintenance records to verify that they demonstrate adequate operability for these components. The inspectors performed an assessment of whether NextEra has initiated sampling of other appropriate media upon loss of a required sampling station.

The inspectors observed the collection and preparation of environmental samples from different environmental media namely, milk, vegetation, and leaves to verify that environmental sampling is representative of the release pathways as specified in the ODCM and that sampling techniques are in accordance with procedures.

Based on direct observation and review of records, the inspectors assessed whether the meteorological instruments were operable, calibrated, and maintained in accordance with procedures. The inspectors assessed whether the meteorological data readout and recording instruments in the control room and at the meteorological tower were operable and were reading the same values.

The inspectors evaluated whether missed and/or anomalous environmental samples were identified and reported in the Annual Radiological Environmental Operating Reports. The inspectors selected three events that involved a missed sample, inoperable sampler, lost TLD, or anomalous measurement to verify that NextEra has identified the cause and has implemented corrective actions. The inspectors reviewed the assessment of any sample results detected above the lower limits of detection and reviewed NextEra's evaluation of associated radioactive effluent release data that was or could have been the source of the released material. No sample results detected radioactive material attributable to Seabrook Station's operations in offsite environmental samples above the lower limits of detection.

The inspectors evaluated whether decommissioning records of leaks, spills, and environmental remediation since the previous inspection are retained in the 10 CFR 50.75(g) decommissioning file, in a retrievable manner.

The inspectors assessed whether the detection sensitivities for environmental samples were below the lower limits of detection specified in the ODCM. The inspectors reviewed the results of the vendor's quality control program, including the interlaboratory comparison, to assess the adequacy of the vendor's program.

Identification and Resolution of Problems

The inspectors assessed whether problems associated with the REMP are being identified by NextEra at an appropriate threshold and appropriate corrective actions are assigned for resolution in their CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

- 4OA1 <u>Performance Indicator Verification</u> (71151)
- .1 <u>Mitigating Systems Performance Index</u> (3 samples)
 - a. Inspection Scope

The inspectors reviewed NextEra's submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2012, through June 30, 2013:

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

To determine the accuracy of the performance indicator (PI) data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed NextEra's operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 <u>Emergency Preparedness Performance Indicators</u> (3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP PIs: (1) Drill and Exercise Performance; (2) ERO Drill Participation; and, (3) ANS Reliability. The last NRC EP inspection at Seabrook was conducted in the second calendar quarter of 2012. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the second calendar quarter of 2012 through the second calendar quarter of 2013 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 6, was used as reference criteria.

b. <u>Findings</u>

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 CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings.

b. Findings

No findings were identified.

.2 <u>Annual Sample: Cooling Tower Level Below Technical Specification Minimum Level for</u> <u>Greater Than Allowed Outage Time</u>

a. Inspection Scope

The inspectors performed an in-depth review of NextEra's failure analysis and corrective actions associated with CR 1830734 that documented an occurrence where SW CT basin level dropped and remained below its TS 3.7.4, "Service Water System/Ultimate Heat Sink," minimum limit for approximately 14 days greater than its TS allowed outage time. NextEra's immediate corrective actions included conducting a fast fill of the CT basin via the fire protection system to restore operability. A self-revealing, Green NCV of TS 3.7.4, "Service Water System/Ultimate Heat Sink," resulted from operators' failure to follow procedures to evaluate a faulty SW CT basin level instrument and was documented in NRC Inspection Report 05000443/2013002.

The inspectors assessed NextEra's problem identification threshold, causal analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether NextEra was appropriately identifying, characterizing, and correcting problems associated with this issue. The inspectors compared the actions taken to the requirements of NextEra's CAP and 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." In addition, the inspectors reviewed documentation associated with this issue, including condition and failure analysis reports, and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions to complete full resolution of the issue.

b. Findings and Observations

No findings were identified.

The inspectors found that NextEra appropriately identified the root cause of the issue. The licensee determined the root cause to be that multiple operations crews were noncompliant with operations standards because of complacent behavior. This behavior enabled crews to rely on a single CT basin level instrument without verifying the level readings using diverse indications, without performing a Senior Reactor Operator walkdown on a deficiency associated with a safety-related component, and without questioning the plant deficiency identified by another crew.

NextEra's immediate corrective actions included conducting a fast fill of the CT basin via the fire protection system to restore operability. NextEra implemented a process that enhanced operations oral boards to focus on proper operations standards and utilizing redundant indications. They also enhanced their simulator training by including scenarios to question assumptions based on decisions by other crews. NextEra also replaced the failed CT basin water level instrument with a new level instrument.

The inspectors determined NextEra's overall response to the issue was timely commensurate with the safety significance, and the actions taken and planned were reasonable to resolve the complacent behavior that enabled non-compliance with operations standards.

.3 Annual Sample: Review of the Operator Workaround Program

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in NextEra procedure OP-AA-108, "Oversight and Control of Operators Burdens," Revision 1.

The inspectors reviewed NextEra's process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent NextEra self assessments of the program. The inspectors also attended a monthly Operator Burden Board Review Meeting and reviewed the licensee's Workaround Impact Assessment to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that NextEra entered operator workarounds and burdens into the corrective action program at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

4OA5 Other Activities

.1 <u>Operation of an Independent Spent Fuel Storage Installation (SFSI) at Operating Plants</u> (60855 and 60855.1)

a. Inspection Scope

On August 5 to 8, 2013, the inspectors observed and evaluated Seabrook's loading of a dry shielded canister (DSC) associated with the licensee's current ISFSI dry cask campaign. The inspectors also reviewed Seabrook's activities related to long-term operation and monitoring of their ISFSI. The inspectors verified compliance with the Certificate of Compliance (CoC), TSs, regulations, and licensee procedures.

The inspectors observed and evaluated Seabrook's loading of the first HD-32PTH canister associated with their current ISFSI dry cask loading campaign. The inspectors observed cask processing operations including: placing the shield plug on the DSC, moving the transfer cask (TC) (with the DSC inside, from the pool to the cask prep area), surveying for contamination and dose rates, vacuum drying, welding operations, visual tests, dye penetrant tests, and helium leak tests. The inspectors also observed the TC/DSC alignment with the horizontal storage module (HSM) and insertion of the DSC

into the HSM. During performance of these activities, the inspectors evaluated the licensee's familiarity with procedures, supervisory oversight, and communication and coordination between the personnel involved. The inspectors attended licensee briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors. The inspectors also reviewed loading and monitoring procedures and evaluated Seabrook's adherence to these procedures.

The inspectors reviewed the licensee's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages to verify that Seabrook was loading fuel in accordance with the CoC and TS. In addition, the inspectors independently verified the cask loading via review of the digital recording. The inspectors confirmed that Seabrook was loading three damaged fuel assemblies during this campaign and verified Seabrook's procedures properly identified the correct DSC locations for damaged fuel assemblies. The inspectors verified the basket fuel compartments containing the damaged fuel assemblies were capped as required by the UFSAR.

The inspectors reviewed radiation protection procedures and radiation work permits associated with the ISFSI loading campaign. The inspectors also reviewed the ALARA goal for the cask loading to determine the adequacy of Seabrook's radiological controls and to ensure that radiation worker doses were ALARA, and that project dose goals could be achieved. The inspectors reviewed radiological survey records from the current loading campaign to confirm that dose rate levels measured on the cask were consistent with values specified in the UFSAR.

The inspectors performed tours of the heavy haul path and ISFSI pad to assess the material condition of the path, pad, and the loaded HSMs, and verified that Seabrook appropriately performed surveillances in accordance with TS requirements. The inspectors verified that transient combustibles were not being stored on the ISFSI pad or in the vicinity of the loaded casks. Environmental reports were reviewed to verify that areas around the ISFSI site boundary were within the limits specified in 10 CFR Part 20 and 10 CFR 72.104. The inspectors confirmed that vehicle entry onto the ISFSI pad was controlled in accordance with Seabrook's procedures.

The inspectors reviewed the licensee's 10 CFR 72.48 screenings to verify that Seabrook had appropriately considered the conditions under which they may make changes without prior NRC approval. The inspectors reviewed revisions to the 10 CFR 72.212 report. The inspectors also reviewed corrective action reports, audit reports, and self-assessments that were generated since the licensee's last loading campaign to ensure that issues were being properly identified, prioritized, and evaluated commensurate with their safety significance.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 31, 2013, the inspectors presented the inspection results to Mr. Kevin 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

K. Walsh, Site Vice President

T. Vehec, Plant General Manager

S. Anderson, Chemistry Technician

- J. Ball, Senior Engineer
- V. Brown, Senior Licensing Engineer

N. Broyer, Non-Destructive Examination Technician

J. Connolly, Engineering Director

D. Currier, Emergency Preparedness Manager

R. Dean, Instrument & Controls Design Engineer

R. Dodds, Site Operations Manager

K. Douglas, Maintenance Director

R. Duarte, Assistant Operations Manager

P. Dullea, Principal Chemist Specialist

J. Dupre, Projects Manager

C. Ellis, Radiation Protection Supervisor

K. Ewell, Project Manager

D. Flahardy, Radiation Protection Manager

A. Giotas, Chemistry Specialist

S. Hamel, Non Destructive Evaluation Level III

R. Healy, Instrument & Controls Supervisor

D. Hickey, Radiation Protection Supervisor

F. Horvath, Electrical Maintenance Supervisor

W. Jacobsen, Project Manager

W. Jenkins, Independent Spent Fuel Storage Installation Fleet Report

E. Kotkowski, Fix-It-Now Supervisor

G. Mikos, Project Manager

S. Morrissey, Electrical Maintenance Superintendent

M. Ossing, Licensing Manager

V. Pascucci, Nuclear Oversight Manager

D. Perkins, Radiation Protection Supervisor

K. Randall, Reactor Engineering Supervisor

D. Robinson, Chemistry Manager

R. Samson, Mechanical Maintenance Superintendent

S. Samstag, Operations Staff

R. Schalk, System Engineer

J. Sobotka, Engineering Programs Manager

D. Strand, Chemistry Supervisor

M. Strum, Principal Radiological Engineer, AREVA

C. Vandiford, Independent Spent Fuel Storage Installation Foreman

T. Waechter, Manager, Special Projects

M. Williams, Director of Field Operations

A-1

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000443/2013004-01

NCV

Inadequate Operability Determination Regarding Service Water Leakage and Associated TS Violation (Section 1R15)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

OS1016.01, Service Water Fill and Vent, Revision 16

OS1016.07, Portable Cooling Tower Pump Operation, Revision 5

OS1216.01, Degraded Ultimate Heat Sink, Revision 22

OX1416.09, Monthly Cooling Tower Portable Pump Operability Surveillance, Revision 10

OX1426.18, Aligning DG1A controls for Auto Start, Revision 4

OS1016.05, Service Water Cooling Tower Operation, Revision 24

OX1416.01, Monthly Service Water Valve Verification, Revision 10

OX1416.05, Service Water Cooling Tower Pumps Quarterly and 2 Year Comprehensive Test, Revision 17

OX1416.06, Service Water Discharge Valves Quarterly Test and 18 Month Position Verification, Revision 09

Action Requests

1866323 1877629 1897254 1897949

Maintenance Orders/Work Orders 40240558 40248185

<u>Miscellaneous</u>

C-X-1-90100-CALC, Pipe Supports for 1-SEPS-DG-2A, B Exhaust System, Revision 0 DBD-SW-01, Service Water Design Basis Document, Revision 6

<u>Drawings</u> 1-SW-B20794, Service Water System Nuclear, Revision 35

Section 1R05: Fire Protection

Miscellaneous Prefire Plans

<u>Drawings</u>

CB-F-3A-A, Control Building – Control Room Complex Sht. 10 of 12, November 07, 2006 CB-F-3C-A, Control Building – Control Room Complex Sht. 12 of 12, October 17, 2006 ET-F-1C-A, Electrical Tunnels "B" Train Elev. (-) 20'-0", (-) 26'-0" Sht. 4 of 6, August 12, 2008 ET-F-1C-A, Electrical Tunnels "A" Train Elev. 0'-0" Sht. 2 of 6, August 12, 2008 ON0443.30, Annual Halon 1301 Inspection and Test, Revision 5

Section 1R11: Licensed Operator Regualification Program

Procedures

OP-AA-100-1000, Conduct of Operations, Revision 10

OX1412.01, PCCW Train A Quarterly Operability, 18 Month Position Indication, and Comprehensive Pump Testing, Revision 18

OX1436.20, Startup Feed Pump Monthly Valve Operability Surveillance, Revision 02 OS1200.00, Response to Fire or Fire Alarm Actuation, Revision 20L

OS1200.01, Safe Shutdown and Cooldown From the Main Control Room, Revision 19

Action Requests

1893730 1893832

Miscellaneous

Simulator Exercise Guide, LOP L3577C, Safe Shutdown (MSO), Revision 00

Section 1R12: Maintenance Effectiveness

<u>Procedures</u> ES1807.012, Ultrasonic Thickness Measurements, Revision 7 ER-AA-100-2002, Maintenance Rule Program Administration, Revision 1 PEG-45, Maintenance Rule Program Monitoring Activities, Revision 17

Action Requests

01860698	01860763	01641409	01829412	01896874	01813807
01813809	01843745	01844592	01860416		

Maintenance Orders/Work Orders							
40235045	40189153	40220476	40152493	40169698	40216637		
40236107							

<u>Miscellaneous</u>

EC274172, OR15 SW Piping Modifications

Drawings EC274172 Sketch SK-EC274172-2024, Revision 4 Piping and Instrumentation Drawing (PID) 1-MS-B20582, Main Steam System Emergency Feedwater Pump Supply Detail, Revision 20

Section 1R13: Maintenance Risk Assessments and Emergent Work Control Procedures

WM 10.1, Online Maintenance, Revision 8 WM-AA-1000, Work Activity Risk Management Process, Revision 13

Maintenance Orders/Work Orders 40217048 40212842

<u>Miscellaneous</u> Work Week 1333-12 Risk Assessment Work Week 1334-01 Risk Assessment Work Week 1335-02 Risk Assessment

Section 1R15: Operability Determinations and Functionality Assessments <u>Procedures</u>

- IS1672.210, 1-SW-L-6129 Service Water Cooling Tower Basin Water Level Loop A Calibration, Revision 8
- IS1672.211, 1-SW-6239 Service Water Cooling Tower Basin Water Level Loop B Calibration, Revision 7
- OS1047.01, Vital Inverter Operation, Revision 14
- OX1416.04, Service Water Quarterly Pump and Discharge Valve Test and Comprehensive Pump Test, Revision 16
- OX1456.86, Operability Testing of IST Pumps, Revision 8
- EN-AA-203-1001, Operability Determinations/Functionality Assessments, Revision 12
- ES1807.012, Ultrasonic Thickness Measurements, Revision 7

Action Requests

1798733	1841737	1850457	1856010	1857228	1874364
1877159	1889301	1889973	1890488	1891409	1892449
1898538	1900794	1900388	1904703*	1916756*	1901319
1637922	1897164	1900905	1897169	1916618*	1916632*
Maintenance	e Orders/Work	<u>Orders</u>			
40145096	40190670	40216457	40249380	40258496	40260791
94056216	94079679	40260904	40200939	40265234	40265240

Miscellaneous

DBD-ED-04, 120 VAC Vital and Non-vital Instrument Power

Operations Shift Logs dated July 15, 2013

Seabrook Station UFSAR, Chapter 8, Electric Power, Revision 14

Troubleshooting Control Form, dated 7/26/13, Revision 0

- Calculation 4.3.8.78F, DG Hx SW Flow Rate, Revision 1
- Calculation C-S-1-83619, Allowable Boundary Valve Leakage For Cooling Tower Operation, Revision 1
- ASME Code Case N513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1, dated January 26, 2009
- Calculation File No. 1301119.301, Evaluation of Remaining Ligament for 24-inch SW Leaking Flaw

Drawings

- SK-EC156603-2001, Installation Detail Service Water Piping Repairs 1-SW-1802-04-153-24" & 1-SW-1802-14-153-24", Revision 0
- SK-EC270504-2000, Installation Detail Service Water Piping Repairs 1-SW-1827-01-153-24", Revision 4

Engineering Changes DCR 95-050, 12195, 277628

Section 1R19: Post-Maintenance Testing

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IX1680.932, Solid State Protection System (SSPS) Train B Mode 1 Actuation Logic Test, Revision 2

LS0564.38, 4160 Volt Dynamic Motor Monitoring, Revision 02

OX1456.81, Operability Testing of IST Valves, Revision 17

OX1416.05, Service Water Cooling Tower Pumps Quarterly And 2 Year Comprehensive Test, Revision 17

OS1016.05, Service Water Cooling Tower Operation, Revision 24

LS0550.09, Timing Relay Acceptance Testing and Maintenance Program, Revision 12 IX1662.410, RC-T-411A Loop 1 Delta T/Tavg Protection Channel I Calibration, Revision 14 IX1662.420, RC-T-411A Loop 1 Delta T/Tavg Protection Channel I Operational Test, Revision 14 LX0557.16, Testing of Molded Case Breakers, Revision 10

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1873367	1882199	1882934	1884734	1885821	1891570
1891970	1895785	1898549	1887802	1893536	1900967
1887576	1893463				

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40111468	40205219	40205262	40207439	40207442	40207443
40215543	40251353	40264224	40215415	40254343	40209572
40260904					

Miscellaneous

RES 91-0196, Agastat Critical Settings

Drawings

1-NHY-301107, Cooling Tower Pump 1-P-110B Close Circuit, Revision 16

Section 1R22: Surveillance Testing

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IS1672.210, 1-SW-L-6129 Service Water Cooling Tower Basin Level Loop A Calibration, Revision 8

- OX1406.02, Containment Building Spray Pump and Valve Quarterly Operability, 18 Month Position Indication and Comprehensive Pump Testing, Revision 17
- OX1436.02, Turbine Driven Emergency Feedwater Pump Quarterly and Monthly Valve Alignment, Revision 19

OX1436.03, Electric EFW Pump Quarterly, 18 Month/30 Days Cold Shutdown and Comprehensive Pump Tests and Monthly Valve Verification Surveillance, Revision 17

OX1436.08, Startup Feed Pump Quarterly Surveillance, Revision 12

OX1436.20, Startup Feed Pump Monthly Valve Operability Surveillance, Revision 02

OX1456.60, Train B ESFAS Slave Relay K640 Quarterly Go Test, Revision 6

OX1456.61, Train A ESFAS Slave Relay K640 Quarterly Go Test, Revision 9

LS0563.23, Type IAC Overcurrent Relay Inspection, Testing and PM, Revision 23

LS0563.17, ITE GR-5 and GR-200 Ground Relay Inspection, Testing and PM, Revision 6

IX1640.352, FW-P-506, High Pressure Turbine Impulse Chamber Pressure Calibration, Revision 9

OX1401.02, RCS Steady State Leak rate Calculation, Revision 8

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1882934	1885821	1891560	1904931	1893492*	1907393*
1897421	1897579	1892525			

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40203452	40203486	40203517	40209962	40209981	40212866
40249380	40206147	40212551			

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Miscellaneous

EP-AA-101-1000, Nuclear Division Drill and Exercise Procedure, Revision 6

EP-AA-102, NextEra Energy Alert and Notification System, Revision 0

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Seabrook Station Radiological Emergency Plan, Revision 63

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SIR.11, WPS-3000 and WPS-4008 Siren Annual Maintenance, Revision 1

SIR.45, State Siren Activation Control System Annual Maintenance and Testing, Revision 3

SIR.76, Local Town Siren Activation Control System Annual Maintenance and Testing, Revision 4

Section 1EP3: Emergency Response Organization Staffing and Augmentation System Miscellaneous

ERO Staffing Succession Planning, dated July 17, 2013

ERO Curricula Status List, dated June 18, 2013

GN 1336.04, Security-Related Emergency Preparedness Equipment and System Testing, Revision 11

NM 11700, Emergency Preparedness Responsibilities of Primary, Subject-to-call, and Secondary, Emergency Response Organization members, Revision 33

Radiological Emergency Preparedness Drill and Exercise Manual, Revision 40

Seabrook Station Emergency Response Manual, Revision 121

Seabrook Station On-Shift Staffing Analysis Report, Revision 1

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Section 1EP4: Emergency Action Level and Emergency Plan Changes

Miscellaneous

ER 5.7, Initial Offsite Dose Projection, Revision 35 Radiological Emergency Plan, Revision 64

Section 1EP5: Correction of Emergency Preparedness Weaknesses

<u>Miscellaneous</u>

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EP-AA-100, FPL/NextEra Energy Nuclear Division Emergency Preparedness Program, Revision 1

EP-AA-100-1000, Conduct of Emergency Preparedness, Revision 4

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EP-AA-100-1006, Evacuation Time Estimates, Revision 0

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Quick-Hit Assessment Report 1723743, Evaluation of the Current Emergency Operations Facility (EOF) Capabilities Versus the New EOF
Quarterly Drill Reports, dated January 2012 – June 2013
Seabrook Nuclear Oversight Report SBK12-014, Emergency Planning
Seabrook Station Development of Evacuation Time Estimates, Final Report, Revision 1
Seabrook Station Emergency Preparedness Facility Inventory Manual, Revision 53
Seabrook Station Emergency Response Manual, Revision 121
Seabrook Station Radiological Emergency Plan, Revision 63
Unusual Event Self-Assessment, June 13, 2012, Chemical Spill
Unusual Event Self-Assessment, October 16, 2012, Seismic Event
WM 8.4, Work Order Process, Revision 21

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394410-05 1712174-02 1712174-04 1756862-02 1769816-02 1775909-23 1775909-25 1775909-28 1775909-29

Section 2RS07: Radiological Environmental Monitoring Program

Procedures

CDI-015, Sampling of Groundwater Monitoring Wells, Revision 2

CD0922.02, Determination of pH using the Orion Model 260 Waterproof Portable pH Meter, Revision 0

CP10.1, Radiological Surveillance and Quality Control Program, Revision 1

CP 4.1, Environmental Surveillances, Revision 24

EV-AA-100-1001, Ground Water Protection Program Implementing Guideline, Revision 2

EV-AA-104, Radiological Environmental Monitoring Program, Revision 0

EV-AA-207, Radiological Environmental Groundwater Monitoring, Revision 0

HD0956.03, Environmental Sampling Groundwater, Revision 6

HD0956.03, Radiological Environmental Sampling of Groundwater, Revision 6

HD0957.01 Calibration Environmental Air Samples, Revision 8

HD095704, Maintenance Environmental Sample Pump Motor, Revision 10

HX0956.01, Radiological Environmental Sampling of Air Particulates & Iodines, Revision 12

HX0956.04, Radiological Environmental Sampling Food Crops and Vegetation, Revision 11

HX0956.05, Radiological Environmental Sampling Milk, Revision 11

IN0654 550, Met System Checks/Data Collection, Revision 8

IX0654.500, Met System Calibration, Revision 13

JX0999.400, Environmental Monitoring of Direct Radiation, Revision 2

RP 17.2, Historical Site Radiological Assessment, Revision 6

Audits, Self-Assessments, and Surveillances

Quick Hit Assessment Report #AR 1711140, Radiological Environmental Monitoring Program, November 30, 2012

- SBK 11-027, Nuclear Oversight Assessment SB Radiological Environmental Monitoring Program, August 30, 2011
- PQA 12-260, Nuclear Oversight Surveillance Report, General Engineering Laboratories, December 4, 2012
- PQA 11-251, Nuclear Oversight Surveillance Report, Environmental Dosimetry Company December 21, 2011

PQA 12-147, Nuclear Oversight Surveillance Report, Normandeau Associates, Inc, July 17, 2012

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01891515	01891529	01891530	01891531	01885759	01890587
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401181769-0 ⁻	1 4022	25642-01	40108606-01	4014	5298-01
Miscellaneous	<u>}</u>				
2011 and 201	2 SB Annual	Radiological En	vironmental Op	perating Repor	t
GEL Laborato	ry Sample S	ubmission Form	for Air Particul	ate and Charc	oal Cartridges,
July 25, 20)13				
GEL Laborato	ry Sample S		for Milk, July 2	5, 2013 	
HD0957.01 F	orm A - Envir	onmental Alr Sa	imple Calibratio	n Record for L	JGM Serial No.
	960, April 25. arm A Envir	, 2013 anmontal Air Sa	mala Calibratia	n Record for F	CM Sorial No
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13014	901. April 25	. 2013			
HD0957.01 F	orm A - Envir	onmental Air Sa	mple Calibratio	n Record for D	OGM Serial No.
14779	959, April 25	, 2013	•		
HD0957.01 F	orm A - Envir	onmental Air Sa	mple Calibratio	n Record for E	DGM Serial No.
14779	958, April 12	, 2013			
HPSTID 04-0	04, REMP Ai	rborne Sample (Collection Frequ	uency Change	from Weekly to
Biwee	kly, October	19, 2004			
HPSTID 13-0	04 SB 2012 H	listorical Site Ra	adiological Asse	essment, July	24, 2013
HX0956.01, F	orm A - Air S	ample Field Log	g Week 30, July	24, 2013	
SB Final Safe	ty Analysis R	eport			
	Specification	S n Manual David	ion 04		
	se Calculatio	n Manual, Revis	Poviow of the	Bases for the	Saabrook PEMP
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Section 40A	1: Performar	nce Indicator V	erification		
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Alert Notificati	on System P	I data, April 201	2 – June 2013		
DEP PI data,	April 2012 –	June 2013			
EPDP-03, Em	ergency Pre	paredness Perfo	ormance Indicat	ors, Revision 2	21
ERO Drill Par	ticipation PI o	lata, April 2012	– June 2013		
Seabrook Cor	itrol Room O	perator Narrativ	e Logs,		
Seabrook Miti	gating Syster	m Performance	Indicator Basis	Document, Re	evision U
INET 99-02, Re	gulatory Ass	essment Perfori	nance indicato	is, Revision 6	

Section 4OA2: Problem Identification and Resolution

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OP-AA-108, Oversight and Control of Operator Burdens, Revision 1 PI-AA-204, Condition Identification and Screening Process, Rev. 21 PI-AA-205, Condition Evaluation and Corrective Action, Rev. 21 Action Requests

1830734	1850101	1852158	1854073	1856760	1858706
1869073	1871244	1873955	1899865	1899867	1900122*
193326					

Maintenance Orders/Work Orders					
01196588	40076783	40145096	40201470		

Miscellaneous

505270, Level Measuring Device and Pulley Assembly Drawing, Revision 2

1830734, Root Cause Evaluation for Cooling Tower Level Below Technical Specification Minimum Level for Greater than Allowed Outage Time

1-NHY-506835, Service Water Cooling Tower Fans Control Loop Diagram, Revision 12 ILD-1-SW-L06129, Instrument Loop Diagram for 1-SW-L-6129, Revision 2

ILD-1-SW-L06129, Instrument Loop Diagram for 1-SW-L-6129, Revision 2

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Memorandum SS# 20130145, Workaround Review Board Meeting Minutes 13-04 Revision 1, July 10, 2013

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SOO: 13-009, Cooling Tower Level Discrepancy, Dated 7/31/13

WO 40215792, Operator Work Around Quarterly Evaluation, September 12, 2013

Section 40A5: Other Activities

Action Requ	<u>uests</u>				
1751825	1766873	1791299	1797800	1871322	1882317
1883379					

Design and Licensing Basis Documents

DFSM, Rev. 05, Dry Fuel Storage Manual, Chapter 2, 10 CFR 72.212 Evaluation Report

Engineering Evaluations

50.59 screenings - 2011-149; 2012-262 72.48 screenings - 2011-003; 2012-002,011; 2013-001,015,017,023 SBK-1FJF-13-014 Seabrook Station - Irradiated Fuel Assembly Selection for Second Dry Cask Loading Campaign

Completed Surveillance and Functional Testing

Canister Documentation Package, Contract 02294236, PO 02318240, Receipt 117070 Quick Hits Assessment Report #1836812, Cask Loading Operational Readiness Assessment SBK 13-009, Seabrook Nuclear Oversight Report, Independent Spent Fuel Storage Installation Seabrook Daily Quality Summary, 1/1/13 - 7/17/13, Dry Fuel Storage

<u>Miscellaneous</u>

ALARA Package No. 13-01, Dry Fuel Transfer Pool to Pad and Associated Tasks for 8 Casks, Revision 00
Certificate of Conformance, NUHOMS OS200 Cask Lifting Yoke
Certificate of Conformance, NUHOMS OSTC-1 Transfer Cask
RS0720, Form A: Material Transfer Form, Revision 13
RWP-13-0031, Dry Fuel Storage Project Activities, Revision 0
STD-F-040, Dry Cask Storage Fuel Assembly Assignments, Revision 05 Survey M-2030805-10, DFS: TC/DSC Platform Top View 51 Survey M-2030806-6, DFS/DSC #51 Dose Rate Survey Only Survey M-2030808-1, DFS Transfer Cask Move to T/T Tech Spec and Commitment Logs, Mode 1, Rev. 141, DFS Temp

Procedures

FS13-01-01, Rev 00, ITLS NUHOMS LT, Helium Leak Testing FS13-01-02, Rev 00, ITLS NUHOMS PT, Liquid Penetrant Testing FS13-01-03, Rev 00, TLS NUHOMS VT, Visual Examination FS13-01-05, Rev 01, SPM 9.1, General Welding Procedure FS13-01-06, Rev 01, SPM 9.1a, Welding Procedure Specification and Qualification FS13-01-07, Rev 01, SPM 9.1b, Welding Procedure Performance Qualification FS13-01-08, Rev 01, SPM 9.1c, Filler Metal Control FS13-01-09, Rev 00, SPM 9.3, NUHOMS - HD 32PTH Type-1 DSC Closure Procedure FS3000.07, Rev. 02, TC and DSC Preparation for Loading FX3000.08, Rev. 03, TC/DSC Handling Operations for Fuel Loading FX3000.12, Rev. 03, DSC Scaling Operations FX3000.14, Rev. 02, DSC Transport from FSB to HSM HX3950.85, Rev. 04, DFS Radiological Controls Welding Procedure TN-P8-P8-GT1 for machine welding Welding Procedure TN-P8-P8-GT2 for GTAW manual welding

Training

Areva Letter, Subject: Seabrook 1 Dry Cask Storage Work with Attachment: Transnuclear LMS Qualification NMatrix, July 18, 2013

Form SPM2.1-2, Rev. 4, Transnuclear Inc. Training Matrix

Training Group Memo, Seabrook Dry Fuel (NUHOMS) Evaluation of Transnuclear Program, April 22, 2013

Maintenance Orders/Work Orders12

01173199 40160996 40194901

* NRC-identified during this inspection period

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LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
ANS	Alert and Notification System
AR	action request
CAP	corrective action program
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
CR	condition report
DPM	drops per minute
DSC	dry shielded canister
EDG	emergency diesel generator
EFW	emergency feedwater
EP	emergency preparedness
ERF	Emergency Response Facility
ERO	Emergency Response Organization
FSAR	Final Safety Analysis Report
GMP	gallons per minute
HSM	horizontal storage module
IMC	Inspection Manual Chapter
IPEEE	Individual Plant Examination of External Events
ISFSI	independent spent fuel storage installation
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OBE	Operating Basis Earthquake
ODCM	Offsite Dose Calculation Manual
OOS	out of service
PAB	Primary Auxiliary Building
PARS	Publicly Available Records
PCCW	primary component cooling water
PI	performance indicator
RCS	reactor coolant system
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
SEPS	supplemental emergency power system
SRA	senior reactor analyst
SSC	structure, system, and component
SSE	Safe Shutdown Earthquake
SW	service water
TC	transfer cask
TS	technical specification
UT	ultrasonic testing
WO	work order