NEXTera ENERGY SEABROOK

December 23, 2013

10 CFR 50.73

Docket No. 50-443
SBK-L-13330

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Seabrook Station
Licensee Event Report (LER) 2013-001
Failure to Enter Technical Specification Following Discovery of SW Leak

Enclosed is Licensee Event Report (LER) 2013-001. This LER reports an event that was discovered at Seabrook Station on October 30, 2013. This event is being reported pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D).

Should you require further information regarding this matter, please contact me at (603) 773-7512.

Sincerely,

NextEra Energy Seabrook, LLC

Victoria S. Braun for
Michael H. Ossing
Licensing Manager

cc: W. Dean, NRC Region I Administrator
J. G. Lamb, NRC Project Manager
P. Cataldo, NRC Senior Resident Inspector



IE22
NRR

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resourse@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

# LICENSEE EVENT REPORT (LER)

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**4. TITLE**

Failure to Enter Technical Specification Following Discovery of SW Leak

| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | | | 8. OTHER FACILITIES INVOLVED | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO. | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | N/A | N/A |
| 10 | 30 | 2013 | 2013 | - 001 - | 00 | 12 | 23 | 2013 | FACILITY NAME: N/A | DOCKET NUMBER: N/A |

**9. OPERATING MODE**

1

**10. POWER LEVEL**

100%

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)***

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☒ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

**12. LICENSEE CONTACT FOR THIS LER**

| NAME | TELEPHONE NUMBER (Include Area Code) |
|---|---|
| Michael H. Ossing, Licensing Manager | (603) 773-7512 |

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
|---|---|---|---|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

**14. SUPPLEMENTAL REPORT EXPECTED**

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

| 15. EXPECTED SUBMISSION DATE | MONTH | DAY | YEAR |
|---|---|---|---|
| | | | |

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*


On October 30, 2013, review of actions taken for a leak in the service water (SW) supply piping determined that the station did not declare SW inoperable and enter TS 3.7.4.d, resulting in the plant operating in a condition prohibited by Technical Specifications from August 8, 2013 to September 1, 2013.

On August 7, 2013 UT examination conducted in response to a small pipe leak, identified a rectangular indication of 2.327" X 1.5" on a field weld on the SW strainer bypass line. A prompt operability determination (POD) found the pipe degraded but operable. When leakage increased on both August 20 and August 28, operators determined that the increase was within the bounds of the initial POD. A relief request was approved by the NRC and a repair completed on September 1.

On October 30, 2013 it was determined that had available information challenging the conclusion of system operability been properly evaluated, Operators would have entered TS 3.7.4.d. The root cause is the POD process lacked sufficient barriers to ensure that the preparation error (Direct Cause) was recognized and corrected prior to POD approval. Corrective action is to revise the Operability Determination procedure to add appropriate process barriers to ensure the engineering evaluation adequately documents consideration of field input information and assumptions for safety functions.

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NARRATIVE

## Description of the Event

On October 30, 2013, a review of actions taken for a leak in the service water (SW) supply piping determined that the station did not declare SW inoperable and enter TS 3.7.4.d, resulting in the plant operating in a condition prohibited by Technical Specifications for 24 days from August 8, 2013 until an approved non-code repair was completed on September 1, 2013.

On August 7, 2013, during routine monitoring, a system engineer identified a small leak that he believed to be a through wall wormhole based on operating experience on the train B SW strainer bypass line. A UT analysis of the leak area was completed on August 8, 2013 and determined that there was a rectangular area of 2.327" x 1.5" where UT readings could not be obtained (UT indication). Engineering review determined that the identified UT indication had no impact on the structural integrity of the piping. Based on this analysis, an immediate operability determination was performed and the piping was found to be operable but degraded. A prompt operability determination (POD) was performed that also determined the piping to be operable but degraded based on the identified leak rate of 10 drops per minute (dpm). Monitoring actions were put in place and future outage repair plans started.

On August 20, 2013, the leak increased to 90 dpm. Based on information obtained from Engineering, Operations concluded that the 90 dpm leak was still well within the bounding allowable leakage as determined by the existing POD.

On August 28, 2013, the leak rate increased to approximately 25 gallons per minute (gpm) following transfer of the SW train from the ocean supply to the cooling tower for surveillance testing. Based on the increase in leakage, the control room staff terminated the surveillance and restored train B SW to the ocean pumps. Leakage decreased to approximately 15 gpm following transfer to the ocean supply. After consulting with Engineering, Operations concluded that the 25 gpm leak was still within the bounding allowable leakage as determined by the existing POD. NRC authorization for the non-code repair was received on August 31, 2013 and the repair was completed on September 1, 2013.

## Cause of the Event

A root cause analysis was conducted for this event.

The direct cause of the event was determined to be:

> Due to overconfidence, Engineering preparation of the Prompt Operability Determination (POD) for the August 7, 2013 SW pipe leak did not address UT examination results in the analysis of potential impact on system safety functions.

The root cause of the event was determined as:

> The NextEra Fleet POD process did not have sufficient process barriers to ensure that the preparation error (Direct Cause) was recognized and corrected prior to POD approval.

The contributing causes for this event are:

1. The UT examiner did not initiate a CR to document and report the anomalous UT results (UT indication).
2. Operations Shift Managers lacked a questioning attitude as to the potential implications for UT indication on system safety functions.

## Analysis of the Event

The function of the SW system is to transfer the heat loads from various sources in both the primary and secondary portions of the plant to the ultimate heat sink. The system is designed to supply sufficient cooling water to its heat loads under possible operating conditions.

The SW system consists of two completely independent and redundant trains with two ocean pumps [BI, P] and one cooling tower pump [BS, P] in each train. Two sources of cooling water are provided for the SW system: the Atlantic

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Ocean and the cooling tower. The normal source of water for the SW system is the ocean through two tunnels, one tunnel from the submerged intake structure offshore and a second tunnel that discharges cooling water to the ocean. The cooling tower serves as the ultimate heat sink during a seismic event that results in blockage of the ocean tunnels. While the ocean serves as the normal supply of cooling water, heat loads can be automatically or manually transferred to the cooling tower.

Technical Specification 3/4.7.4 requires that the SW System be Operable in Modes 1 through 4. This includes

- An operable SW pump house and two service water loops with an operable SW pump in each loop and,
- An operable mechanical draft cooling tower and two cooling tower loops with one operable cooling tower pump in each loop, and
- A portable cooling tower makeup system stored in its design operational readiness state.

The SW strainer bypass line is located upstream of the Primary Component Cooling Water (PCCW) and Diesel Generator (DG) heat exchangers and is pressurized during ocean pump alignment and cooling tower operation. The line is not isolable with the system in service. If a leak at this location was large enough, cooling tower inventory and the ability to operate for seven days without makeup could be impacted. The calculated maximum acceptable boundary leakage for 7 day cooling tower operation is approximately137.25 gpm. The POD performed on August 8, 2013 for the leak discovered on August 7, 2013 concluded that the leak was estimated to be less than 10 drops per minute. A structural evaluation performed for the August 7, 2013 specifically addressed the UT indication and concluded that the structural integrity of the SW bypass line was not compromised and there was no structural impact on the service water system. The evaluation of the other SW safety functions (Cooling Tower inventory, Cooling supply to PCCW and EDG heat exchangers and PAB flooding) did not address the UT indication. Based on the leak rate of 10 dpm, both the preparer and reviewer of the POD were of the opinion that this leak was the same as previous pin hole leaks identified in service water piping. The POD documented the propagation of the leak was assumed to be a ½" diameter hole based on the 10 dpm leak.

On August 20, 2013, the leak increased to 90 dpm. On August 21, 2013, a second UT examination was performed of the leak area. The UT examination confirmed the indication size had not changed, however a depression (concavity) in the UT indication area of approximately 1/2" in diameter was noted. The UT examination results were evaluated by Engineering; concluding that since the size of the indication had not changed the structural integrity of the pipe is maintained. Based on information obtained from Engineering, Operations concluded that the current leak rate was within the bounding allowable leakage as determined by the prompt operability.

On August 28, 2013 at 1900, during surveillance testing of the train-B cooling tower pump, it was determined that the previously identified leak had increased to approximately 25 gpm. During the swap to the cooling tower pumps SW header pressure typically increases. In this situation, the SW header pressure increased from 48 psi to 66 psi. Based on the increase in leakage and SW header pressure, the control room staff terminated the surveillance and restored train B SW to the ocean pumps. When returned to the ocean pumps, 'B' SW header pressure returned to 48 psi and leakage decreased to approximately 15 gpm. Assessment of operability at that time determined that the SW system remained operable with the increased leakage based on the operability determination performed previously for the August 7, 2013 SW leak. A housekeeping patch was placed on the pipe and discussions regarding a relief request for a noncode repair started with the NRC. The repair was completed on September 1, 2013.

On October 30, 2013, a review of the event determined that the POD performed for the August 7, 2013 leak did not provide reasonable assurance of continued operability of the SW system. Therefore, the SW leak rendered the ocean and cooling tower loops in SW train B inoperable. TS 3.7.4, action d applies to this condition and requires restoring at least one loop to operable status within 24 hours or placing the plant in Mode 3 in the next six hours and in Mode 5 in the next 30 hours. The plant exceeded the allowed outage time and shutdown time of the TS action when it operated from August 8, 2013 until September 1, 2013, when the leak was repaired. The review of the event also found that concurrent with the unrecognized inoperability of SW train B, the train A SW train was rendered inoperable for testing and maintenance activities. On August 15, 2013, train A SW was rendered inoperable on two occasions for a total time

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of approximately three hours. The concurrent inoperability of both trains of the SW system resulted in a condition that could have prevented fulfillment of the safety function of the SW system. Therefore, this event meets the reporting criteria of 10 CFR 50.73(a)(2)(i)(B) for an operation or condition prohibited by the TS and 10 CFR 50.73 (a)(2)(v)(D) for an event that could have prevented fulfillment of a safety function needed to mitigate the consequences of an accident.

No adverse consequences resulted from this event, and this incident had no adverse impact on the health and safety of the public or the plant and its personnel. This event did involve a safety system functional failure because both trains of the SW system were inoperable for approximately three hours on August 15, 2013. Nonetheless, this event was of minimal risk significance, having no impact on core damage frequency or large early release frequency as during the time in question, the SW system remained functional. No inoperable structures, systems, or components contributed to this event.

**Corrective Actions**

The Root Cause Team identified the following corrective actions:

1. Involved individuals involved in the POD preparation were coached and mentored on documentation requirements for POD preparation.
2. Revise the Fleet procedure to add appropriate process barriers to ensure the engineering evaluation adequately documents consideration of field input information and assumptions for safety functions. Include an independent review or supervisory review and require assumptions be stated (including disposition of input data), i.e., UT, NDE inspection results and observations.
3. Reinforce procedure requirement to initiate a condition report for unexpected UT results even if the UT is being performed as part of an already identified condition.
4. Prepare and present a case study regarding this event and root cause evaluation to Engineering, Operations Shift Management and Station Leadership.

**Similar Events**

A review of the corrective action program and LERs in the past five years identified no similar events.

**Failed Components**

None.

**Additional Information**

The Energy Industry Identification System (EIIS) codes are included in this LER in the following format: [EIIS system identifier].