



September 13, 2012

10 CFR 50.73

Docket No. 50-443

SBK-L-12188

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

Seabrook Station

Licensee Event Report (LER) 2012-001-00

Inadequate Testing of Certain Emergency Feedwater Actuation System Relays

Enclosed is Licensee Event Report (LER) 2012-001-00. This LER reports an event that was discovered at Seabrook Station on July 18, 2012. This event is being reported pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B).

Should you require further information regarding this matter, please contact Mr. Michael O'Keefe, Licensing Manager, at (603) 773-7745.

Sincerely,

NextEra Energy Seabrook, LLC

A handwritten signature in black ink, appearing to read "Kevin T. Walsh".

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Kevin T. Walsh  
Site Vice President

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

Handwritten initials "JE22" and "NRC" in black ink.

**LICENSEE EVENT REPORT (LER)**

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.resource@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.

<b>1. FACILITY NAME</b> Seabrook Station	<b>2. DOCKET NUMBER</b> 05000443	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
Inadequate Testing of Certain Emergency Feedwater Actuation System Relays

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
07	18	2012	2012	- 001	- 00	09	13	2012	FACILITY NAME	DOCKET NUMBER

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)</b> <input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(ix)(A) <b>10. POWER LEVEL</b> 85% <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(x) <input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 73.71(a)(4) <input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 73.71(a)(5) <input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> OTHER <input type="checkbox"/> 20.2203(a)(2)(vi) <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(v)(D) <div style="text-align: right; font-size: small;">Specify in Abstract below or in NRC Form 366A</div>									
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**12. LICENSEE CONTACT FOR THIS LER**

NAME Michael O'Keefe, Licensing Manager	TELEPHONE NUMBER (Include Area Code) 603-773-7745
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**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

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b> MONTH:    DAY:    YEAR:
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**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)**

On July 18, 2012, during operation at approximately 85% power, while performing an extent of condition review for a previously identified missed surveillance, station personnel identified that the response time for starting and loading of the motor-driven emergency feedwater pump (EFW) pump (FW-P-37-B) had not been adequately tested, resulting in a condition prohibited by the Technical Specifications (TS). The instrumentation that actuates the motor-driven EFW pump on steam generator (SG) low-low water level includes Solid State Protection System master relay K515 and slave relay K640. Surveillance testing has not verified the response times of these relays since initial testing in 1986. Therefore, the response time for EFW actuation on low-low SG level has not been adequately tested as required by TS 3.3.2, Engineered Safety Features Actuation System Instrumentation.

The event resulted from ineffective methods utilized in the mid 1980's to verify that surveillance test procedures ensured compliance with the TS. The corrective actions for this condition will include development of a procedure that verifies response time for actuation of the motor-driven EFW pump following a low-low-SG water level and measurement of the response time during the refueling outage in the fall of 2012. No adverse consequences resulted from this event.

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**NARRATIVE**

**Description of Event**

On July 18, 2012, during operation at approximately 85% power, while performing an extent of condition review for a previously identified missed surveillance, station personnel identified that the response time for starting and loading of the motor-driven emergency feedwater pump (EFW) pump [BA, P](FW-P-37-B) had not been adequately tested, resulting in a condition prohibited by the Technical Specifications (TS). The instrumentation that actuates the motor-driven EFW pump on steam generator (SG) [AB, SG] low-low water level includes Solid State Protection System (SSPS) master relay K515 [JE, RLY] and slave relay K640 [JE, RLY]. Surveillance testing has not verified the response times of these relays since initial testing in 1986. Therefore, the response time of EFW actuation on low-low SG level has not been adequately tested as required by TS 3.3.2, Engineered Safety Features Actuation System Instrumentation.

**Cause of Event**

Programmatic and process weaknesses in the mid 1980's allowed for the development of a surveillance procedure that failed to test the motor-driven EFW pump starting and loading response times following actuation on low-low SG water level. The root cause of the event was that the procedure development process in effect prior to station operation did not require validation of technical bases when surveillance procedures were initially developed. Current programmatic guidance for procedure development is substantially more robust.

**Analysis of the Event**

The EFW system, which includes one turbine-driven pump [BA, P] and one motor-driven pump, actuates automatically on loss of offsite power, low-low level in any SG, safety injection actuation, or an ATWS mitigation system actuation signal to remove heat from the Reactor Coolant System [AB] during emergency conditions. TS surveillance 4.3.2.2 requires that the response time of each Engineered Safety Features Actuation System (ESFAS) function shall be verified to be within limits at least once per 18 months. The motor-driven EFW pump must start and achieve its required discharge pressure within 77 seconds following initiation of a safety injection signal or a low-low SG water level signal.

In March of 2011, the Seabrook staff identified that feedwater [BA] isolation on hi-hi SG level was not being adequately tested as required by TS surveillance 4.3.2.2, which resulted in declaration of a missed surveillance. An extent of condition review was conducted as one of the corrective actions for the missed surveillance. The review identified that the response time for starting and loading FW-P-37-B had not been adequately tested. To ensure that response time requirements are met for EFW actuation on low-low SG water level, response time testing must include SSPS output relays K515 and K640. However, surveillance testing has not verified the response times of these relays since initial testing in 1986. As a result, the condition resulted in an operation prohibited by the TS and is reportable under 10 CFR 50.73(a)(2)(i)(B).

An operability determination concluded that the motor-driven EFW pump and its associated low-low SG level actuation circuitry were capable of starting and loading the EFW pump within the required response time. A calculation using measurements of the response time for motor-driven EFW pump starting and loading following actuation of a safety injection signal obtained during the last refueling outage and the bounding master and slave relay response time allocations from WCAP-14036-P-A, "Elimination of Periodic Protection Channel Response Time Tests," provided an overall response time for starting and loading of the EFW pump for a low-low SG water level condition. The calculation demonstrated that there is approximately an 18-second margin to the response time limit.

The response of the EFW actuation circuitry to a plant trip that occurred in October, 2011, (Event No. 47327) provides further evidence that the SSPS relays are within response time limits. As a result of the plant trip, the motor-driven EFW pump automatically started on a low-low SG water level signal. A review of plant data determined that the time between actuation of the low-low SG water level signal and start of the motor-driven EFW pump was 76 milliseconds. This

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**NARRATIVE**

response time segment included SSPS relays K515 and K640 as well as the SSPS input relays and SSPS logic. The 76 millisecond response time is well within the 18 second margin to the response time limit.

Although relays K515 and K640 have not been explicitly response time tested at the required surveillance frequency, they are periodically tested by a series of overlapping operational tests that confirm proper operation. Master relay K515 is actuated as part of the SSPS logic test. This test also verifies coil integrity for slave relay K640 by passing a small current through the slave relay coil when the master relay contact is closed. The function of slave relay K640 is validated by a periodic Go Test, which energizes the relay coil, closes relay contacts, and actuates the circuit breaker for FW-P-37-B. The ability of the master relay contact to carry sufficient current to actuate slave relay K640 was verified during initial plant startup testing.

This event is of regulatory significance because it met the reporting criterion of 10 CFR 50.73 (a)(2)(i)(B) for a condition prohibited by the TS. However, this event had no adverse impact on the health and safety of the public or the plant and its personnel. Although the FW-P-37-B starting and loading response time for a low-low steam generator level condition has not been adequately tested in accordance with the TS, an evaluation concluded that the low-low SG level actuation circuitry remains capable of starting and loading the EFW pump within the required response time. No plant transients, systems actuations, or consequences resulted from this event. This event did not involve a safety system functional failure.

**Corrective Actions**

The corrective actions include development of procedures to verify response time for actuation of the motor-driven EFW pump following a low-low-SG water level and measurement of the response time. Response time measurements are obtained with the plant shutdown during testing that initiates engineered safety features (ESF) actuation signals and actuates ESF equipment. Based on the plant conditions required for testing, verification of the response times will occur during the refueling outage in the fall of 2012. An additional extent of condition review is being performed to verify the adequacy of Engineered Safety Features Actuation System and Reactor Trip System surveillance procedures.

**Similar Events**

In March of 2011, Seabrook personnel identified that feedwater isolation on hi-hi steam generator level was not being adequately tested as required by TS 4.3.2.2, which resulted in declaration of a missed surveillance.

**Additional Information**

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