



**FPL Energy**  
**Seabrook Station**

**FPL Energy Seabrook Station**  
**P.O. Box 300**  
**Seabrook, NH 03874**  
**(603) 773-7000**

October 27, 2006

Docket No. 50-443

SBK-L-06207

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

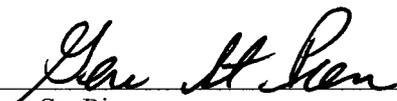
Seabrook Station  
Licensee Event Report (LER) 2006-006-00  
Plant Shutdown Due to Inoperable Diesel Generators

Enclosed is Licensee Event Report (LER) 2006-006-00. This LER reports an event that occurred at Seabrook Station on August 31, 2006. This event is being reported pursuant to the requirements of 10CFR50.73(a)(2)(i)(B).

Should you require further information regarding this matter, please contact Mr. James M. Peschel, Regulatory Programs Manager, at (603) 773-7194.

Very truly yours,

FPL Energy Seabrook, LLC

  
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Gene St. Pierre  
Site Vice President

cc: S. J. Collins, NRC Region I Administrator  
G. E. Miller, NRC Project Manager, Project Directorate I-2  
G. T. Dentel, NRC Senior Resident Inspector

*IE22*

**ENCLOSURE TO SBK-L-06207**

# LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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> 05000 443	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
Plant Shutdown Due to Inoperable Emergency Diesel Generators

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
08	31	2006	2006	- 006 -	00	10	27	2006	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

<b>9. OPERATING MODE</b> 1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:</b> (Check all that apply)							
<b>10. POWER LEVEL</b> 100	<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)				
	<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 checked="" 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 type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A					

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME James M. Peschel, Regulatory Programs Manager	TELEPHONE NUMBER (Include Area Code) 603-773-7194
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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 checked="" type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH 12	DAY 15	YEAR 2006
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**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 31, 2006 at 1409 during operation in Mode 1 at 100% power, Seabrook Station entered the action statement of Technical Specification (TS) 3.8.1.1, AC Sources – Operating, for two inoperable emergency diesel generators (EDG). While inoperable for a planned maintenance outage, the train-A EDG received a voltage regulator diode failure light during a test run. During subsequent testing to confirm operability, the train-B EDG displayed a diode failure light, experienced an over-voltage condition, and was declared inoperable. With two EDGs inoperable, the station entered action f of TS 3.8.1.1, which requires restoration of one EDG within two hours or a shutdown to Hot Standby within the next 6 hours. A plant shutdown commenced at 1530. The NRC was notified of the initiation of this TS-required shutdown in a four-hour report (event # 42820) in accordance with 10CFR50.72(b)(2)(i). The plant entered Mode 3 at 2052 on August 31, 2006. EDG-B was restored to operable status at 1359 on September 1, and the unit remained in mode 3 during repair of EDG-A, which was restored to operable status at 1928 on September 2, 2006. No adverse consequences resulted from this event. A root cause evaluation is on going to determine the reason for the malfunctions of the voltage regulators.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Seabrook Station	0500-0443	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 3
		2006	- 006	- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

I. Description of Event

On August 31, 2006 at 1409 during operation in Mode 1 at 100% power, Seabrook Station entered the action statement of Technical Specification (TS) 3.8.1.1, AC Sources – Operating, for two inoperable emergency diesel generators (EDG) [EK, DG]. While inoperable for a planned maintenance outage, the train-A EDG received a voltage regulator [EK, EC] diode [EK, SCR] failure light during a test run. During subsequent testing to confirm operability, the train-B EDG displayed a diode failure light with an over-voltage condition, which resulted in EDG-B being declared inoperable. With two EDGs inoperable, the station entered action f of TS 3.8.1.1, which requires restoration of one EDG within two hours or a shutdown to Hot Standby within the next 6 hours. A plant shutdown commenced at 1530, and the plant entered Mode 3 at 2052 on August 31, 2006. The NRC was notified of the initiation of this TS-required shutdown in a four-hour report (event # 42820) in accordance with 10CFR50.72(b)(2)(i). EDG-B was restored to operable status at 1359 on September 1, and the unit remained in mode 3 during repair of EDG-A, which was restored to operable status at 1928 on September 2, 2006.

II. Cause of Event

An on going root cause evaluation is analyzing this event to determine the cause of the failures of the EDG voltage regulator components. The investigation of the train-B EDG voltage regulator malfunction attributed the failure to degradation of one of the seven capacitors [EK, CAP] in the noise-reduction circuits in the power chassis. Following replacement of the seven capacitors, EDG-B operated satisfactorily and was restored to operable status. These components were replaced and sent to an off-site laboratory for testing. Preliminary troubleshooting on the train-A EDG determined that a malfunction of either the T5 transformer circuit [EK, XFMR] or a gate firing board caused the voltage regulator diode failure. These components were replaced and sent to an off-site laboratory for testing. In addition, the same capacitors that were replaced on the train-B EDG were also replaced on the train-A EDG.

The EDG-B voltage regulator system has had previous failures involving an over-voltage condition. A root cause evaluation is ongoing to determine the reason for the malfunctions.

III. Analysis of Event

The two EDGs, each one connected to a redundant emergency bus, comprise the onsite emergency source of AC electrical power. One EDG is capable of supplying sufficient power for operation of the minimum safety features equipment required during a postulated loss-of-coolant accident concurrent with a loss of offsite power. During a loss-of-coolant accident, each diesel generator starts automatically on a safety injection signal and, if offsite power is not available, it is connected to its associated emergency bus. The safety features equipment is then sequentially started.

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Seabrook Station	0500-0443	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	Page 3 of 3
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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

Both EDGs were inoperable for approximately 24 hours, from 1409 on August 31 to 1359 on September 1, 2006. This event met the reporting criteria of 10CFR50.72(b)(2)(i) and 50.73(a)(2)(i)(A) for initiation and completion of a plant shutdown required by the TS. This event is of regulatory significance because the condition was sufficiently serious to warrant a plant shutdown. Nonetheless, no systems actuations or consequences resulted from the event, and this occurrence had no adverse impact on the plant or on the health and safety of the public. No inoperable structures, systems, or components other than the EDGs contributed to the event.

While inoperable for planned maintenance on August 31, 2006 the train-A EDG experienced a voltage regulator diode failure light indication during a test run. However, the EDG satisfied the technical specification requirements for voltage and frequency. The generator voltage attained its nominal value in less than ten seconds following starting of the engine, and voltage was maintained during operation of the EDG. EDG-A was capable of carrying full load during and after the time that the diode failure light was on. Data obtained during the test run showed that one SCR was providing the required power contribution to the generator field, one SCR was providing a partial contribution, and one SCR was not providing any contribution to the generator field. The difference between the SCR power contributions was the reason the diode failure light was lit. Based on test data and vendor information, only one SCR is required to maintain generator voltage at full load. Therefore, EDG-A was functional and capable of carrying full load and fulfilling the safety function of the on-site emergency power system.

During this event, the Supplemental Emergency Power System (SEPS) was available and capable of carrying its design bases emergency loads. Additionally, all three offsite lines and associated on-site transformers were available to power the emergency buses. Based on the functional capability of EDG-A, the PRA risk assessment for the event determined that the incremental core damage probability (ICDP) was 6.88E-07.

IV. Corrective Actions

The corrective actions for the failures of the EDG voltage regulators will be determined upon completion of the root cause evaluation of this event. The immediate corrective actions consisted of replacing numerous components in the voltage regulator systems on both EDGs. As an interim measure, until the start of OR11, the station is performed surveillance testing of each EDG on a two-week interval. On September 27, 2006 EGD-A experienced an additional diode failure alarm. The subsequent troubleshooting determined that the K1 contactor was defective with one phase not making ideal contact. The contactor was replaced.

Similar Events

The emergency diesel generators have previously experienced voltage regulator failures; however, none of these events resulted in a plant shutdown or reportable event.