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Vice President - Hatch

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Docket No.: 50-321

NL-10-1458

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant  
Licensee Event Report 2010-004-0  
Emergency Diesel Generator 1A Excess Fuel Oil Return Tubing Failure

Ladies and Gentlemen:

In accordance with the requirements of 10CFR 50.73(a)(2)(i)(B), Southern Nuclear Operating Company (SNC) hereby submits the enclosed Licensee Event Report which addresses a failure of a section of fuel tubing on an emergency diesel generator.

This letter contains no NRC commitments. If you have any questions, please contact Doug McKinney at (205) 992-5982.

Respectfully submitted,

A handwritten signature in cursive script that reads "Dennis R. Madison".

D. R. Madison  
Vice President - Hatch

DRM/WEB/msc

Enclosure: LER 2010-004-0

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cc: Southern Nuclear Operating Company  
Mr. J. T. Gasser, Executive Vice President  
Ms. P. M. Marino, Vice President – Engineering  
RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. R. E. Martin, NRR Project Manager – Hatch  
Mr. E.D. Morris, Senior Resident Inspector – Hatch

Edwin I. Hatch Nuclear Plant

Emergency Diesel Generator 1A Excess Fuel Oil Return Tubing Failure

Enclosure 1

Licensee Event Report 2010-004-0

**LICENSEE EVENT REPORT (LER)**

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> Edwin I. Hatch Nuclear Plant Unit 1	<b>2. DOCKET NUMBER</b> 05000 321	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Emergency Diesel Generator 1A Excess Fuel Oil Return Tubing Failure

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
06	03	2010	2010	- 004 -	0	07	30	2010	FACILITY NAME	DOCKET NUMBER

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:</b> <i>(Check all that apply)</i>							
<b>10. POWER LEVEL</b>  99.8	<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 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)	Specify in Abstract below or in NRC Form 366A					

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME Edwin I. Hatch / B. D. McKinney, Regulatory Response Manager	TELEPHONE NUMBER (Include Area Code) (205) 992-5982
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	EK	DG	F010	Y					

<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

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

During operation of Emergency Diesel Generator (EDG) 1A for monthly surveillance, at 1443 EDT on June 03, 2010 with the Unit operating at full power, a section of one-quarter-inch tubing in the fuel oil system became disconnected from its fitting rendering EDG1A inoperable due to the potential for fire. Applicable requirements of the Technical Specifications were accomplished and plant operations continued. The tubing's function is to route waste fuel oil from the injectors to the fuel oil collection tank. The tubing separation occurred at the fitting to a discharge check valve which prevents backflow of waste oil to the injectors. This tubing failure occurred subsequent to an observed small amount of leakage at the same location on April 01, 2010. An attempt at that time to stop that leakage by tightening the fitting was unsuccessful. Subsequent to the attempt to stop the leakage, the potential impact on EDG operation was evaluated and judged to be acceptable for EDG operation pending future repair. The apparent cause of both the leakage and subsequent tubing separation was degradation of the tubing connection due to wear and stresses resulting from the repetitive disassembly and re-assembly during scheduled maintenance activities. Subsequent to both the noted leakage and the tubing separation, the corresponding tubing for the other four EDGs was examined for signs of leakage or cracking. None was found and those EDGs were determined to be operable.

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

**PLANT AND SYSTEM IDENTIFICATION**

General Electric – Boiling Water Reactor  
Energy Industry Identification System codes appear in the text as (EIIS EK)

**DESCRIPTION OF EVENT**

On June 03, 2010, at approximately 1443 EDT, with Unit 1 operating at 2799 CMWTh, 99.8 percent rated thermal power, a section of one-quarter inch tubing in EDG 1A’s fuel system separated from the fitting that secured it to a discharge check valve. The discharge of diesel fuel oil from the subject tubing on to the surfaces of the EDG exhaust manifold and into its environs created the potential for unsafe conditions for continued EDG operation, and the EDG 1A was secured at approximately 1448 EDT. The EDG had been in operation for planned monthly surveillance at the time of the tubing separation. Based on the information available at the time, it was judged that EDG 1A would not be capable of performing its intended safety function for its applicable mission time, and it was declared to be inoperable. Actions required by Technical Specification Limiting Condition for Operation (LCO) 3.8.1 were taken, including the verification of operability of the remaining Unit 1 EDGs.

The subject tubing is one quarter inch in diameter. It functions to direct “waste” diesel fuel oil from the EDG’s fuel injectors to a fuel oil collection tank on the EDG skid. In the subject line is a check valve which prevents possible back flow of the fuel oil in the line. The separation of the tubing occurred at the point of connection of the tubing and the outlet side of that check valve. That connection is secured by a typical flared-compression-type fitting of the tubing being attached to the check valve’s tapered threaded fitting by a compression nut.

**CAUSE OF EVENT**

The direct cause of the tubing separation was judged to be degradation of the flared compression-type fitting due to apparent tubing wall thinning likely produced by repeated stressing of the material through repetitive removal and re-assembly of the fitting connecting the failed tubing and the associated check valve as part of planned diesel generator maintenance. The repeated application of the stress from torquing the fitting’s compression nut upon re-assembly can thin the material and in some cases can lead to cracking of the tubing wall.

A precursor to the tubing failure was noted on April 01, 2010, when a small amount of leakage from this same portion of tubing was noted. An attempt to stop the leakage by torquing the compression nut of the fitting to the check valve was unsuccessful, and an evaluation of continued operation of the EDG was made. Due to nature of the leak (dripping onto the floor area), the limited leak rate and the fact that the surface onto which the fuel oil was leaking was well below the diesel fuel oil ignition temperature (a margin on the order of 300 degrees Fahrenheit), EDG operation was judged to be operable. A work order for repair of the leakage was initiated but had not been worked prior to the June 3, 2010 event.

**REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT**

This event is reportable under 10CFR 50.73(a)(2)(i)(B), in that an event and an associated condition occurred and existed that was prohibited by the technical specifications. It is reportable since surveillance testing indicated that equipment (e.g., one train of a multiple train system) was not capable of performing its specified safety functions from the time of the discovery of the precursor leak on April 01, 2010, and, thus would have been inoperable for a period of time longer than allowed by technical specifications (i.e., the 72-hour LCO allowed outage time). The June 03, 2010 testing was conducted within the required time (i.e., the

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surveillance interval plus any allowed extension), however there was firm evidence, based on a review of relevant information drawn from equipment history and the Condition Reporting system (i.e., CR 2010104391) that the causative condition that resulted in the tubing separation existed previously.

By virtue of the fact that the condition revealed by the April 01, 2010 leak that led to the separation which occurred during the June 03, 2010 surveillance was documented at the time of that discovery, this event meets the reporting criteria for 50.73(a)(2)(i)(B).

This event occurred during routine maintenance / surveillance operation of EDG 1A with Unit 1 at approximately full power with electrical power for the unit's auxiliary loads connected to 4.16-kV buses being supplied from off-site sources through the unit's auxiliary transformers and startup transformers. Thus, the cessation of the operation of EDG 1A due to the dispersal of fuel oil from the failed tubing did not result in any plant transient or loss of operating equipment function other than EDG 1A itself.

Upon the declaration of the inoperable status of EDG 1A due to the perceived risk of fire from the fuel oil released to the environs by the separated tubing, the Technical Specification Limiting Condition for Operation (LCO) 3.8.1 applied and the appropriate Actions (specifically, those Actions required for Condition B – "One Unit 1 or the swing DG inoperable") were taken.

The design of the plant's electrical power systems and compliance with the associated technical specifications provide assurance of independent and redundant available sources of power to the Engineered Safety Feature (ESF) systems during all anticipated operational occurrences and accident conditions. Thus, the electrical power required to safely shut down the reactor, maintain the shutdown condition, and operate all auxiliaries necessary for plant safety was available throughout this event. Based on this information, this event had low safety significance.

**CORRECTIVE ACTIONS**

Short term corrective actions implemented in response to the subject separation of a section of the tubing of the EDG 1A fuel oil system were the following.

EDG 1A was shutdown to stop the release of diesel fuel oil to the EDG's environs upon discovery of the tubing failure.

EDG 1A was declared inoperable and LCO 3.8.1 was entered and applicable Actions for Condition B were taken.

The separated tubing in the diesel fuel oil system of EDG 1A was repaired and the EDG returned to available status on June 04, 2010 at 1535 EDST. The EDG was restored to operable status and the associated action statement was cleared at 0130 on June 05, 2010.

The corresponding portions of tubing in each of the other four EDGs in the plants electrical power system were inspected and showed no degradation or cracking. There was slight wear noted at the tips of the flares on EDGs 1B and 1C. As a preemptive measure the applicable tubing on all EDGS was replaced since the subject tubing on all EDGs was of a like design and had experienced a similar service and maintenance history.

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It should be noted that at the time of the April 01, 2010 observation of a fuel leak on EDG 1A noted above, an inspection of the other four EDGs was conducted to verify that there were no evidence of current leakage or residue that would indicate past leakage at the corresponding fuel line connections. That inspection determined that the leakage noted on EDG 1A was unique to that diesel generator.

A cause determination for the failed tubing was initiated and is near its conclusion. Depending of the findings of that cause determination and any associated recommendations, additional longer term corrective or preventative actions may be enacted. If the circumstances or conclusions described herein are significantly revised through the review of that cause determination by staff and management, a supplemental Licensee Event Report will be submitted for the NRC's information and files.

**ADDITIONAL INFORMATION**

**Failed Component Information:**

Other Systems Affected: 4.16 kV ESF buses 1E (lost onsite standby power source when EDG 1A declared inoperable)

EIIS System Code: EK

EIIS Component Code: DG

Manufacturer: Fairbanks Morse

Model Number: 3800TD

Type: one quarter inch diameter steel tubing – skid mounted EDG vendor supplied sub-component

Manufacturer Code: F010

Commitment Information: This report does not create any new permanent licensing commitments

Previous Similar Events: None