

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

10CFR50.73

October 6, 2005

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

Serial No.: 5-668  
SPS: PAK  
Docket No.: 50-280  
50-281  
License No.: DPR-32  
DPR-37

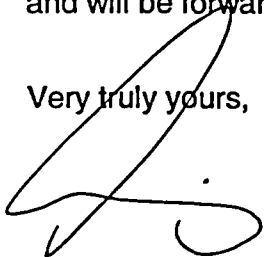
Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Units 1 and 2.

Report No. 50-280, 50-281/2005-003-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Management Safety Review Committee for its review.

Very truly yours,



Donald E. Jernigan,  
Site Vice President  
Surry Power Station

Enclosure

Commitments contained in this letter:

None

JE22

cc: United States Nuclear Regulatory Commission  
Region II

Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303-8931

Mr. N. P. Garrett  
NRC Senior Resident Inspector  
Surry Power Station

NRC FORM 366 (6-2004)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY IMB: NO. 3150-0104		EXPIRES 06/30/2007												
<b>LICENSEE EVENT REPORT (LER)</b>  (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 <a href="mailto:infocollect@nrc.gov">infocollect@nrc.gov</a> , 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.									
1. FACILITY NAME <b>Surry Power Station, Unit 1</b>					2. DOCKET NUMBER <b>05000 - 280</b>					3. PAGE <b>1 OF 4</b>									
4. TITLE <b>Fuel Leak Into Engine Oil Causes Emergency Service Water Pump Inoperability</b>																			
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 <b>Surry Power Station, Unit 2</b>					DOCKET NUMBER <b>05000 - 281</b>					
<b>06</b>	<b>11</b>	<b>2005</b>	<b>2005 — 003 — 00</b>			<b>10</b>	<b>6</b>	<b>2005</b>	FACILITY NAME					DOCKET NUMBER <b>05000</b>					
9. OPERATING MODE  <b>N</b>			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)																
10. POWER LEVEL  <b>100%</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)(vii)(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 checked="" 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 <b>Donald E. Jernigan, Site Vice President</b>										TELEPHONE NUMBER (Include Area Code) <b>(757) 365-2001</b>									
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>B</b>	<b>BI</b>	<b>ENG</b>	<b>D699</b>	<b>Y</b>															
14. SUPPLEMENTAL REPORT EXPECTED										15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR					
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO																			
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																			
<p>On August 11, 2005, with both units at 100% reactor power, the results from the monthly engine oil samples for Emergency Service Water Pump (ESWP) 1B indicated an increase in fuel contamination. Evaluation of the previous monthly engine oil samples indicated an increasing trend of fuel contamination with a corresponding decrease in viscosity. The indication of fuel intrusion into the engine oil began with the June 11, 2005 sample at a rate such that satisfactory operation of the ESWP could not be sustained for an extended period of time. The ESWP was declared inoperable on August 11, 2005 at 1900 hours.</p> <p>A root cause evaluation determined that fuel was entering the engine oil system from a leak at the connection between the fuel inlet jumper and the #1L fuel injector. The leak occurred due to a flat spot on the injector flared fitting mating surface. The leak was repaired and ESWP 1B was returned to service. Procedures will be revised to inspect the fuel line seating surface and to perform a timed fuel line pressure drop test.</p> <p>A risk assessment determined that the impact of the unavailability of ESWP 1B on core damage frequency was negligible at less than 5E-9/year. During the period when the 1B pump was assumed to be inoperable, a second pump was taken out of service. The integrated risk with two ESWPs out of service remained at very low safety significance.</p>																			

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Surry Power Station	05000 - 280	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2005	— 003	— 00	

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

**1.0 DESCRIPTION OF THE EVENT**

On August 11, 2005, with Units 1 and 2 operating at 100% reactor power, the results of the monthly engine oil sample for Emergency Service Water Pump (ESWP) 1B [EIIS-BI, ENG] indicated fuel contamination of the engine oil in the marginal range. Evaluation of previous monthly oil analyses revealed that although the results remained within the acceptable range, an increasing trend of fuel contamination began with the June 11, 2005 sample. The rate of fuel intrusion was such that the ESWP could not sustain long-term operation. Engine oil viscosity also exhibited a concurrent, declining trend but remained within the acceptable range as well. Based on this evaluation, ESWP 1B was declared inoperable on August 11, 2005 at 1900 hours.

Subsequent inspection and pressure test of the fuel system found a leak at the connection between the fuel supply jumper and the #1L fuel injector. The fuel injector and jumper were replaced, the fuel system was pressure tested satisfactorily, and the engine oil was changed. ESWP 1B was declared operable on August 17, 2005 following a successful return to service operational test.

Technical Specification (TS) 3.14.A.4 requires that the reactor coolant system not exceed 350°F or 450 psig or that the reactor shall not be critical unless three ESWPs are operable. This requirement may be modified to have two ESWPs operable for a period not to exceed 7 days. ESWP 1B was assumed to be inoperable beginning June 11, 2005 and remained inoperable until completion of testing on August 17, 2005, exceeding the allowed outage time of 7 days. Therefore, this report is being submitted pursuant to 10CFR50.73(a)(2)(i)(B), any operation or condition that was prohibited by the plant's TS. In addition, during the period when the 1B pump was assumed to be inoperable, a second ESWP was taken out of service to perform maintenance or modifications. The long-term service water requirement for a design basis accident on one unit and the service water requirement to bring the other unit to Hot Shutdown are greater than the design capacity of one ESWP. Therefore, this report is also being submitted pursuant to 10CFR50.73(a)(2)(v)(D), any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

**2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

Each ESWP has a design capacity of 15,000 gallon per minute (GPM). The long-term service water requirements for a design basis accident in one unit with a simultaneous loss-of-station power and the second unit being brought to Hot Shutdown is greater than 15,000 gpm. Additional service water is required to bring the non-accident unit to Cold Shutdown. Considering a single active failure of one pump, TS require three ESWPs to be operable to ensure sufficient cooling water is available in the event of an accident. One ESWP is permitted to be inoperable for up to a 7-day period to provide operational flexibility for testing or maintenance without requiring unit outages.

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1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Surry Power Station	05000 - 280	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
		2005	— 003	— 00	

Although the ESWP 1B was considered to be inoperable since June 11, 2005, it continued to operate during the monthly surveillance test. If needed, the pump would have been capable of satisfactory performance however, due to engine oil contamination would operate for a duration less than required by design basis.

A Safety Monitor analysis for one ESWP inoperable for the period June 11 to August 17, 2005, found the impact to be negligible at less than 5E-9/year. During this period, a second ESWP was removed from service for brief periods to perform maintenance or modifications. Assuming a second ESWP out of service for the entire period, the integrated risk remained low and would be classified as an issue of very low safety significance.

### 3.0 CAUSE

The cause for the fuel entering the engine oil system of ESWP 1B and for the lower oil viscosity was a leak at the connection between the fuel inlet line and the 1L injector. The root cause for the leak was a failure to identify and correct a defect at the seating area on the inlet of the 1L injector where the flared end of the fuel line seats. This defect was a flat spot that extends through the entire flared fitting seating surface. When initially installed, the connection did not leak, as indicated by the fuel system pressure test and the engine oil analysis. However, over time due to vibration, heat-up and cool-down this fitting began to leak.

### 4.0 IMMEDIATE CORRECTIVE ACTION(S)

An inspection and pressure test of the fuel system for ESWP 1B was conducted. During this inspection a leak was identified at the flared connection between the jumper and the inlet side of the #1L fuel injector. The fuel injector and jumper were replaced, all other fuel system mechanical joints were tightened, the engine oil was changed, and a satisfactory fuel system pressure test as well as a successful return to service test run was performed.

### 5.0 ADDITIONAL CORRECTIVE ACTIONS

An engine oil sample was obtained after the return to service test. The results of the analysis for fuel contamination of the engine oil and for oil viscosity were acceptable. The oil analysis results for the September sample were also acceptable.

The engine oil analysis results from the two other ESWP diesels, the three Station Emergency diesels, the Station Blackout diesel, and the Security diesel were reviewed for fuel contamination of the engine oil and for oil viscosity. The review concluded that the results were consistent and within acceptable ranges.

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Surry Power Station	05000 - 280	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		2005	— 003	— 00	

**6.0 ACTIONS TO PREVENT RECURRENCE**

Maintenance procedures have been revised to identify defects by inspecting the seating surface of the connection of the fuel lines to the injectors.

**7.0 SIMILAR EVENTS**

Fuel contamination of Surry's Emergency Diesel Generator #3 engine oil was detected in 1984 and 1990. In both cases, the cause was determined to be a loose connection at the fuel injector. Engine oil testing for fuel contamination was initiated. Also, a visual inspection for fuel leaks during engine operation following maintenance was initiated. No additional issues for fuel contamination of engine oil were identified.

**8.0 MANUFACTURER/MODEL NUMBER**

Detroit Diesel Model 8V71

**9.0 ADDITIONAL INFORMATION**

None