

**Virginia Electric and Power Company  
Surry Power Station  
5570 Hog Island Road  
Surry, Virginia 23883**

November 4, 2015

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

Serial No.: 15-509  
SPS: JSA  
Docket No.: 50-281  
License No.: DRP-37

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

Report No. 50-281/2015-002-00

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

Very truly yours,



N. L. Lane  
Site Vice President  
Surry Power Station

Enclosure

Commitment contained in this letter: None

cc: U.S. Nuclear Regulatory Commission, Region II  
Marquis One Tower, Suite 1200  
245 Peachtree Center Ave., NE  
Atlanta, GA 30303-1257

NRC Senior Resident Inspector  
Surry Power Station





**LICENSEE EVENT REPORT (LER)**  
(See Page 2 for required number of digits/characters for each block)

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 and Information Collections Branch (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> Surry Power Station, Unit 2	<b>2. DOCKET NUMBER</b> 05000281	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Unanticipated Start of EDG 2 During Testing

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
09	16	2015	2015	002	00	11	04	2015		05000
									FACILITY NAME	DOCKET NUMBER
										05000

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

N	<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)
100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" 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 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**

LICENSEE CONTACT N. L. Lane, Site Vice President	TELEPHONE NUMBER (Include Area Code) (757) 365-2001
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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
B	ED	RLY	W120	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)

On September 16, 2015, at 2014 hours with Units 1 and 2 operating at 100 percent power, Emergency Diesel Generator 2 automatically started and assumed power to the Unit 2 'H' emergency bus. The event occurred during quarterly performance of the Emergency Bus Undervoltage and Degraded Voltage Protection Test. The direct cause of the event was the defective "A" single phase relay sticking and preventing the relay contacts from changing state. The procedures for Emergency Bus Undervoltage and Degraded Voltage Protection Tests have been revised to physically validate the state of the emergency bus relays prior to testing additional relays. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) for valid actuation of an Emergency Diesel Generator.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

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 and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [infocollects.Resource@nrc.gov](mailto: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.

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Surry Power Station	05000 - 281	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 4	
		2015	- 002	- 00		

**NARRATIVE**

**1.0 DESCRIPTION OF THE EVENT**

The purpose of the Emergency Bus Undervoltage and Degraded Voltage Protection Test is to provide quarterly testing of undervoltage and degraded voltage protection schemes of the emergency bus trains as required by Surry Technical Specifications. The Undervoltage Protection Channels consist of three individual single phase relays [EIIS-ED-RLY]. These relays provide input to a two out of three coincident relay logic for operation. One of the functions of the undervoltage circuits is to sense a loss of voltage condition and place the respective emergency bus on the Emergency Diesel Generator (EDG) [EIIS-EK-DG].

On September 16, 2015, at 2014 hours with Units 1 and 2 operating at 100 percent power, an undervoltage signal was generated during performance of the Emergency Bus Undervoltage and Degraded Voltage Protection Test. As a result, EDG 2 started and loaded as designed on the Unit 2 'H' emergency bus.

During performance of the test, the 'A' phase undervoltage portion of the test was successfully completed and an indication light verified that 'A' phase was left in its normal energized condition. At 2014 hours, when testing of the 'B' phase began, a undervoltage signal was generated and EDG 2 started and assumed the load of the Unit 2 'H' emergency bus. The test was terminated and operations initiated the abnormal procedure for loss of the Unit 2 'H' emergency bus. At 2216 hours on September 17, 2015, normal source power was restored to the 'H' bus and EDG 2 was unloaded, taken offline and placed back in automatic at 2244 hours on September 17, 2015.

On September 17, 2015 at 0027 hours, an event notification was made to the NRC in accordance with 10 CFR 50.72(b)(3)(iv)(A) for valid actuation of EDG 2 following loss of the Unit 2 'H' emergency bus during performance of the Emergency Bus Undervoltage and Degraded Protection Test.

This report is being submitted, pursuant to 10 CFR 50.73(a)(2)(iv)(A), for automatic actuation of the EDG.

**2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

This event resulted in no safety consequences or implications. Appropriate operator actions were taken in accordance with abnormal operating procedures and the unit remained at 100 percent power. Station equipment was available and responded as designed. Therefore, the health and safety of the public were not affected.

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**3.0 CAUSE**

Troubleshooting determined that upon completion of the 'A' phase undervoltage test, the 'A' single phase relay did not reset. However, an indication light verified that 'A' phase was in its normal powered condition. Therefore, when the 'B' phase undervoltage test began and the 'B' phase relay was deenergized, the two out of three coincident logic was met resulting in the normal power supply breaker to the 'H' bus to open, as designed. EDG 2 started and loaded as designed on the Unit 2 'H' emergency bus.

The direct cause of the 'A' single phase relay not resetting was debris and warping in the relay slug chamber and signs of heat damage. These conditions prevented smooth movement of the relay slug in the chamber and resulted in it sticking and preventing the relay contacts from changing state.

The apparent cause of the undervoltage signal and resultant loss of the Unit 2 'H' emergency bus was a procedural deficiency that relied upon a light indication of power to the relay but did not verify the position of the relay after each step of the undervoltage test.

**4.0 IMMEDIATE CORRECTIVE ACTION(S)**

Normal offsite power was restored to the 'H' bus at 2216 hours on September 17, 2015 and EDG 2 was unloaded, taken offline and placed back in automatic. The failed relay was replaced.

**5.0 ADDITIONAL CORRECTIVE ACTIONS**

An apparent cause evaluation was completed to investigate the event.

**6.0 ACTIONS TO PREVENT RECURRENCE**

The procedures for Emergency Bus Undervoltage and Degraded Voltage Protection Tests have been revised to physically validate the state of the emergency bus relays to ensure the two out of three logics will not be satisfied if a relay fails to energize.

**7.0 SIMILAR EVENTS**

None

**8.0 MANUFACTURER/MODEL NUMBER**

Westinghouse/ARD440UR

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**9.0 ADDITIONAL INFORMATION**

Unit 1 was at 100% power and remained unaffected by the starting of EDG 2.