10CFR50.73

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

December 11, 2015

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

Serial No.: 15-544
SPS: JSA
Docket No.: 50-280
License No.: DRP-32

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

Report No. 50-280/2015-003-00

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

IE22
NRR

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Surry Power Station, Unit 1	05000 - 280	1 OF 3

4. TITLE

Unit 1 Reactor Trip Due to Loss of Main Generator Field

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
										05000
10	13	2015	2015	- 003 -	00	12	11	2015	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	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

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

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	TB	EXC	S366	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

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

On October 13, 2015 at 1815 hours, with Unit 1 at 100 percent power and Unit 2 at 93.5 percent power at the end of life coastdown, Unit 1 experienced a reactor trip initiated from a turbine trip by main generator trip. The main generator trip was due to a loss of the main generator field that caused a loss of field protection relay to trip.

All three auxiliary feedwater pumps automatically started on low-low steam generator water level providing flow to the steam generators. Main steam trip valves were closed due to primary cooldown in accordance with emergency operating procedures and the plant was stabilized using steam generator power operated relief valves. The direct cause of the loss of main generator field of the Unit 1 generator was an electrical fault in the main generator exciter spacer coupling. Corrective actions to prevent recurrence will be implemented through the corrective action program when the root cause evaluation is completed.

This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A) as an event that resulted in the automatic actuation of the Reactor Protection System and the Auxiliary Feedwater System.

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NARRATIVE

1.0 DESCRIPTION OF THE EVENT

On October 13, 2015 at 1815 hours, with Unit 1 at 100 percent power and Unit 2 at 93.5 percent power at the end of life coastdown, Unit 1 experienced a reactor trip initiated from a turbine trip by main generator trip. The main generator trip was due to a loss of the main generator field [EIIS-TB] that caused a loss of field protection relay to trip.

Automatic systems responded to the reactor/turbine trip as designed. All three auxiliary feedwater (AFW) pumps [EIIS-BA-P] automatically initiated on low-low steam generator (SG) water level providing flow to the SGs [EIIS-AB-SG]. Following the reactor trip, reactor coolant system (RCS) temperature fell below the nominal temperature of 547 degrees Fahrenheit and reached a minimum of 542 degrees Fahrenheit. The lower temperature was due to the expected opening of at least one SG power operated relief valve (PORV) [EIIS-AB-RV], injection of AFW flow, valve alignment of gland steam being supplied by main steam versus auxiliary steam and leakby of a moisture separator reheater steam supply control valve [EIIS-SB-FCV]. Due to the primary cooldown, the main steam trip valves [EIIS-SB-ISV] were closed at 1836 hours as directed by emergency operating procedures and the plant was stabilized using SG PORVs. AFW was subsequently secured by procedural guidance and Unit 1 was placed in hot shutdown using normal operating procedures.

At 2120 hours, a four-hour report was made pursuant to 10CFR50.72(b)(2)(iv)(B) due to valid automatic actuation of Reactor Protection Systems and an eight-hour report was made pursuant to 10CFR50.72(b)(3)(iv)(A) due to automatic actuation of the AFW system.

This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A) as an event that resulted in the automatic actuation of the Reactor Protection System and the AFW system.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

This event resulted in no safety consequences or implications. There was no testing or surveillances in progress when the reactor trip occurred. Appropriate operator actions were taken in accordance with emergency operating procedures and the unit was quickly brought to a stable condition. Station equipment relied upon to mitigate the event responded as designed. Therefore, the health and safety of the public were not affected.

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NARRATIVE

3.0 CAUSE

The direct cause of the loss of main generator field of the Unit 1 generator was an electrical fault in the main generator exciter spacer coupling. Disassembly of the generator exciter found damage to the electrical connections between the exciter, spacer coupling and generator. The electrical fault was caused by a poor connection between one of the main generator exciter coupling butterfly leads and axial lead. The poor connection was due to a deficiency in the assembly process when the connection was last assembled during a refueling outage in May 2015.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

Following the reactor trip, control room operators acted promptly to place the unit in a safe, shutdown condition in accordance with emergency operating procedures.

5.0 ADDITIONAL CORRECTIVE ACTIONS

A root cause evaluation (RCE) team was assembled to determine the cause of this event and to recommend corrective actions. The leakby of the moisture separator reheater steam supply control valve has been repaired and Engineering is evaluating the valve alignment of gland steam being supplied by main steam versus auxiliary steam.

6.0 ACTIONS TO PREVENT RECURRENCE

Additional corrective actions to prevent deficiencies during the assembly process will be identified when the RCE is completed and will be implemented through the corrective action program.

7.0 SIMILAR EVENTS

None

8.0 MANUFACTURER/MODEL NUMBER

Siemens Westinghouse/Mark III

9.0 ADDITIONAL INFORMATION

Unit 2 was at 93.5 percent power at the end of life coastdown and remained unaffected by the Unit 1 reactor trip.