10CFR50.73

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

November 5, 1999

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

Serial No.: 99-582
SPS: JSA
Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Dear Sirs:

Pursuant to 10 CFR 50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Units 1 and 2.

Report No. 50-280/1999-007-00

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,

E. S. Grecheck
Site Vice President

Enclosure

Commitments contained in this letter:

1. Appropriate staff was briefed on the reporting requirements regarding ESF actuations. The need for additional training is being evaluated.

2. Approved RCE recommendations, designed to prevent the recurrence of a similar event, will be implemented through the corrective action program.

IE22

cc: U. S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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 reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
SURRY POWER STATION , Unit 1	05000 – 280	1 OF 4

TITLE (4): Undervoltage Actuation Due to a Loss of Reserve Station Service Transformer

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	09	1999	1999	– 007	-- 00	11	05	1999	Surry Power Station, Unit 2	05000 -- 281
									FACILITY NAME	DOCKET NUMBER
										05000 --

OPERATING MODE (9)	N
POWER LEVEL (10)	100%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
E. S. Grecheck, Site Vice President	(757) 365-2001

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 9, 1999, at 1234 hours, with Units 1 and 2 at 100% power, control room annunciators alarmed, indicating an overvoltage condition on the Unit 1 "H" (1H) and Unit 2 "J" (2J) emergency buses. Operators dispatched to the "C" Reserve Station Service Transformer (RSST) saw small flames at the bus bar-to-cable connections for the "A" phase of the 4160 V feeder from the "C" RSST to the station. At 1241 hours, an electrical arc from a cable connection to the metal siding of the adjacent Turbine Building resulted in an "A" phase-to-ground fault and "C" RSST lockout. The loss of the "C" RSST caused an undervoltage condition on the "F" transfer bus and a loss of the 1H and 2J emergency buses. Emergency Diesel Generators Nos. 1 and 3 automatically started, as designed, and re-energized the buses. The station's fire brigade quickly responded to the fire and control room operators executed the appropriate abnormal and operating procedures. A root cause evaluation (RCE) has preliminarily concluded that moisture intrusion into the protective sleeve of one of the cable connections provided a conductive path, producing electrical arcing. The damaged "C" RSST "A" phase cable connection was replaced. Approved RCE recommendations, designed to prevent the recurrence of a similar event, will be implemented. This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv).

1.0 DESCRIPTION OF THE EVENT

On October 9, 1999, at 1234 hours, with Units 1 and 2 at 100% power, control room annunciators [EIIS-IB] 1K-G-2 (BUS 1H OVERVOLT) and 2K-G-3 (BUS 2J OVERVOLT) alarmed. Operators dispatched to the "C" Reserve Station Service Transformer (RSST) [EIIS-EB,XFMR] saw small flames at the bus bar-to-cable connections for the "A" phase of the 4160 V feeder from the "C" RSST to the station. These connections are located adjacent to the Unit 2 Turbine Building. Abnormal Procedure 0-AP-48.00, "Fire Protection-Operations Response", was initiated. At 1241 hours, an electrical arc from a cable connector to the metal siding of the Turbine Building resulted in an "A" phase-to-ground fault and "C" RSST lockout. The loss of the "C" RSST caused an undervoltage condition on the "F" transfer bus and a loss of the Unit 1 "H" (1H) and Unit 2 "J" (2J) emergency buses [EIIS-EB,BU]. Emergency Diesel Generators (EDG) Nos. 1 and 3 [EIIS-EK,DG] automatically started in response to undervoltage signals and re-energized the 1H and 2J emergency buses, respectively. The undervoltage signals also caused the 1H and 2J stub buses to trip and the automatic start of Unit 1 charging pump 1-CH-P-1B [EIIS-CB,P] and Unit 2 charging pump 2-CH-P-1A. Component cooling pumps 1-CC-P-1A and 1-CC-P-1D [EIIS-CC,P], which were in the standby mode, received a trip signal in addition to the loss of the stub buses and were, therefore, rendered inoperable. Plant systems responded, as expected, and the undervoltage actuations occurred, as designed.

Unit 1 remained at 100% power and Unit 2 decreased power to 96% due to a brief interruption of control power to the Unit 2 turbine electro-hydraulic system that resulted from the loss of the 2J emergency bus. Unit 2 was returned to 100% power at 1400 hours after all unit conditions were verified to be stable.

At 2015 hours, the loss of voltage actuation was determined to be a valid Engineered Safety Feature (ESF) actuation. The NRC was notified pursuant to 10 CFR 50.72 (b)(2)(ii) at 2213 hours. This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv) as an automatic actuation of an ESF.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

The station's fire brigade quickly responded to the fire and equipment damage was limited to a single cable connection to the "C" RSST 4160 V bus. Plant systems performed as designed in response to the undervoltage condition on the 1H and 2J emergency buses and control room operators executed the appropriate abnormal and operating procedures to ensure unit stability. The normal offsite power supply was restored to the affected emergency buses within the Technical Specification (TS) allowed out of service time. Therefore, this event resulted in no significant safety consequences and the health and safety of the public were not affected at any time.

3.0 CAUSE

A root cause evaluation (RCE) is being performed to determine the cause of this event. The RCE has preliminarily concluded that the vertical orientation of the failed cable connection to the "C" RSST 4160 V bus permitted moisture to enter the protective sleeve of the connection. The moisture within the connection provided a conductive path from the cable conductor to the cable shielding. This path allowed electrical arcing to occur within the connection, which caused the overvoltage annunciator to alarm. This condition also caused an electrical arc to the adjacent metal wall of the Turbine Building, resulting in an "A" phase-to-ground fault and "C" RSST lockout. The loss of the transformer produced an undervoltage condition on the 1H and 2J emergency buses, which resulted in the automatic start and loading of EDGs No. 1 and No. 3.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

Following the automatic start of EDGs No. 1 and No. 3, control room operators executed the appropriate abnormal and operating procedures.

Action statements were entered at 1241 hours in accordance with TS 3.16, to restore the normal offsite power supply to the 1H and 2J emergency buses within seven days or place the units in a cold shutdown condition. An additional action statement was entered at 1241 hours in accordance with TS 3.13, to return component cooling pumps 1-CC-P-1A and 1-CC-P-1D to operable status within 24 hours or place the units in a hot shutdown condition.

The fire brigade responded quickly to the scene of the fire. The fire was reported to be extinguished at 1243 hours and a firewatch was posted to ensure the fire did not re-ignite.

5.0 ADDITIONAL CORRECTIVE ACTIONS

The 1H and 2J stub buses were re-energized and 1-CC-P-1A and 1-CC-P-1D were returned to operable status on October 9, 1999, at 1320 and 1317 hours, respectively. The TS 3.13 action statement was terminated.

The damaged "C" RSST "A" phase cable connection was replaced. New termination kits were installed on the remaining "C" RSST cables. In addition, drain holes were drilled into the barrel of each lug connector to allow any moisture accumulation to escape.

5.0 ADDITIONAL CORRECTIVE ACTIONS (Continued)

The normal offsite power supply was restored to the 1H and 2J buses on October 11, 1999, at 1210 and 1308 hours, respectively, and the TS 3.16 action statements were terminated. EDGs Nos. 1 and 3 were subsequently shutdown and returned to a standby status.

Engineering assessed the condition of the bus bar-to-cable connections for the "A" and "B" RSSTs and concluded that the horizontal orientation of these connections are less prone to moisture intrusion and did not require immediate rework.

Appropriate staff was briefed on the reporting requirements regarding ESF actuations. The need for additional training is being evaluated.

6.0 ACTIONS TO PREVENT RECURRENCE

Approved RCE recommendations, designed to prevent the recurrence of a similar event, will be implemented through the corrective action program.

7.0 SIMILAR EVENTS

Plant Issue S-1999-2264, September 13, 1999
Annunciator 1K-G2 "BUS 1H OVERVOLT" Received for "C" RSST

This previous event was similar in that electrical arcing was seen on the output cabling for "C" RSST. The event, however, did not involve an ESF actuation because a loss of voltage did not occur.