VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

September 25, 2006

10CFR50.73

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

Serial No.: 06-810
SPS: PAK
Docket No.: 50-281
License No.: 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 Unit 2.

Report No. 50-281/2006-001-00

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:

1. Procedures will be revised to ensure that the charging pump intermediate seal coolers are sufficiently vented prior to returning them to service following maintenance.

IE22

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

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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Surry Power Station, Unit 2	05000 - 281	1 OF 4

4. TITLE

Charging Pump Component Cooling Water System Inoperable Due to Inadequate Venting

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
07	27	2006	2006	— 001 —	00	09	25	2006		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

N

10. POWER LEVEL

100%

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

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☑ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☑ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER *(Include Area Code)*
Donald E. Jernigan	(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
D	CH	P	Goulds	No					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

At 1947 hours on July 27, 2006, with Unit 2 operating at 100% power, a Unit 2 charging pump cooling water pump low discharge pressure main control room alarm was received while restoring the 'A' charging pump intermediate seal cooler to service. The standby charging pump cooling water pump started automatically, but no component cooling (CC) water flow was observed. Unit 2 charging pumps were declared inoperable and a 6-hour clock to hot shutdown (HSD) was entered in accordance with Technical Specifications (TSs) 3.0.1. The charging pump cooling water subsystem was vented and the standby charging pump cooling water pump restored to normal flow. The 6-hour HSD clock was exited at 2125 hours. A cause evaluation determined that the procedure did not provide proper guidance to sufficiently vent the cooler, which caused both charging pump cooling water pumps to become air bound. The procedure will be revised to ensure sufficient venting. The risk of this event was determined to be low and the charging crosstie from Unit 1 remained available, therefore, the health and safety of the public was not affected.

This report is submitted pursuant to the requirements of 50.73(a)(2)(i)(B), a condition prohibited by TSs, and 50.73(a)(2)(vii), an event that caused two independent trains to become inoperable.

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

1.0 DESCRIPTION OF THE EVENT

The charging pump cooling water subsystem provides component cooling (CC) water for the charging pump seal coolers. CC water circulating in the charging pump mechanical seal cooling loops is cooled by intermediate seal coolers which reject heat to the charging pump service water system. The charging pump cooling water subsystem consists of two full-capacity charging pump cooling water pumps and two full-capacity intermediate seal coolers providing 100% redundancy. To ensure that CC water is continually available to the charging pump seal coolers, one charging pump cooling water pump is placed in operation while the other pump is maintained in standby. The standby charging pump cooling water pump is automatically actuated on low pump discharge pressure to supply CC water in the event of failure of the operating pump.

On July 27, 2006, with Unit 2 operating at 100% power, repair of a leak on the Unit 2 'A' charging pump intermediate seal cooler's CC water discharge line was completed. After the repair, the CC water side of the intermediate seal cooler was vented in accordance with procedures by opening the intermediate seal cooler vent valve (high side) and valving in system pressure. At 1947 hours, while restoring the intermediate seal cooler to a normal line-up, a main control room annunciator alarm was received indicating that the CC water pressure had decreased. The standby charging pump cooling water pump started automatically, as expected, but no CC water flow was observed. The operating Unit 2 charging pump continued to run throughout this event however, since the charging pump cooling water subsystem is a subsystem of the charging pumps, the Unit 2 charging pumps were declared inoperable and a 6-hour clock to hot shutdown (HSD) was entered in accordance with Technical Specifications (TSs) 3.0.1.

The charging pump cooling water subsystem was successfully vented and at 2043 hours, CC flow was restored at 25 gallons per minute (GPM). The flow rate of the subsystem continued to increase and, at 2125 hours, the 6-hour TS 3.0.1 clock was exited prior to initiating actions to shutdown the unit.

This report is being issued pursuant to 10 CFR 50.73(a)(2)(i)(B), any operation or condition prohibited by TSs. Since the event caused two independent trains to become inoperable, this report is also being issued pursuant to 10 CFR 50.73(a)(2)(vii).

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

During normal operation, the charging pumps are used as part of the chemical and volume control system and take suction from the volume control tank. Normal operating temperature of the source water is within the operating range of the mechanical seals. During accident conditions, the charging pumps are used as high head safety injection

(SI) pumps and take suction from the cool refueling water storage tank (RWST). However, after recirculation mode transfer (RMT), the high head SI pumps take suction from the discharge of the low head SI pumps, which take suction from the containment sump. Water pumped from the containment sump is expected to be warmer than the maximum SI pump seal operating temperature, therefore the charging pump cooling water subsystem is required to maintain the SI pump mechanical seals temperature within operating range during accident conditions.

The PRA model reflects the high head SI pump's dependency on the charging pump cooling water subsystem after RMT. An analysis of this event indicated that the Allowed Configuration Time (the time required to accumulate a Core Damage Probability (CDP) of 1.0E-6) for this configuration was 955 hours. Since the charging pump cooling water pumps were unavailable for one hour and 38 minutes, the CDP associated with this event was 1.7E-9. In addition, during the limited time the Unit 2 charging pump cooling water subsystem was unavailable, the charging pump crosstie from Unit 1 was available to provide charging to Unit 2. Therefore, with the low risk and availability of the crosstie, the health and safety of the public was not affected by this event.

3.0 CAUSE

The procedure used to return the charging pump intermediate seal cooler to service was determined to be inadequate to ensure proper venting of the entire intermediate seal cooler. Procedure guidance did not account for the intermediate seal cooler piping configuration that required the cooler to be slowly filled during return to service to ensure sufficient venting of the cooler. As a result, air remaining in the cooler was introduced into the charging pump cooling water subsystem and caused air binding of both charging pump cooling water pumps.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

Both charging pump cooling water pumps were stopped and the outlet of the 'A' intermediate seal cooler was isolated. The standby charging pump cooling water pump discharge valve was also isolated. The standby charging pump cooling water pump was then started and its discharge valve slowly opened while monitoring discharge pressure. The cooling water subsystem was vented and the standby charging pump cooling water pump was restored to partial flow at 2043 hours. The standby charging pump cooling water pump discharge valve was fully opened and CC water flow was restored to normal flow on the standby pump at 2125 hours.

5.0 ADDITIONAL CORRECTIVE ACTIONS

The Unit 2 'A' charging pump intermediate seal cooler was placed in service following completion of all Post Maintenance Testing (PMT).

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6.0 ACTIONS TO PREVENT RECURRENCE

Procedures will be revised to ensure that the charging pump intermediate seal coolers are sufficiently vented prior to returning them to service following maintenance.

7.0 SIMILAR EVENTS

Surry Unit 1 LER 87-033-00, Charging Pump Cooling Water System Inoperable Due to Inadequate Test Procedure, documented a similar air binding event; however, at the time the system was vented at the charging pump cooling water pump casing. Corrective actions moved the venting to the high point of the intermediate seal cooler and the cooler has since been successfully vented several times.

8.0 MANUFACTURER/MODEL NUMBER

Goulds/3996ST