

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

December 17, 2003

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

Serial No.: 03-591  
SPS: CGL R1  
Docket No.: 50-280  
50-281  
License No.: DPR-32  
DPR-37

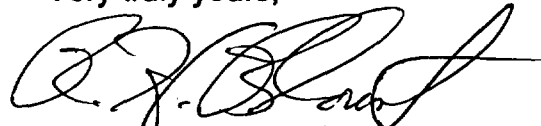
Dear Sirs:

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

Report No. 50-280/2003-005-00

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,



Richard H. Blount, Site Vice President  
Surry Power Station

Enclosure

Commitments contained in this letter:

1. Dominion will monitor the Westinghouse Owners Group's review of the Surry circumstances and application of WCAP-15603, Rev. 1-A in Appendix R analyses for potential impact on the actions already taken or planned.
2. The Fire Safety Alert interim measures will remain in place until a revision to the fire protection administrative procedure is made to address transient combustible controls commensurate with the significance of the fire area.
3. A request for engineering assistance will be developed to address permanent resolution of this Appendix R concern regarding loss of RCP seal cooling. The justification for continued operation, currently in place, will remain in place until permanent resolution is defined and implemented.

IE22

cc: **United States Nuclear Regulatory Commission  
Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23 T85  
Atlanta, Georgia 30303-8931**

**Mr. G. J. McCoy  
NRC Senior Resident Inspector  
Surry Power Station**

**LICENSEE EVENT REPORT (LER)**

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

Estimated burden per response to comply with this mandatory information 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 Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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.

FACILITY NAME (1) <b>SURRY POWER STATION Unit 1</b>	DOCKET NUMBER (2) <b>05000 - 280</b>	PAGE (3) <b>1 OF 5</b>
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TITLE (4)  
**Unanalyzed Condition Related to Loss of RCP Seal Cooling during an Appendix R Fire Event**

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
11	03	2003	2003	-- 005 --	00	12	17	2003	FACILITY NAME	DOCKET NUMBER 05000-
									FACILITY NAME	DOCKET NUMBER 05000-

OPERATING MODE (9)	N/A	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)								
POWER LEVEL (10)	100 %	20.2201(b)		20.2203(a)(3)(ii)	X	50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)		
		20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)		
		20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)		
		20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)		
		20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER		
		20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A		
		20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)				
		20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)				
		20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)				
		20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)				

LICENSEE CONTACT FOR THIS LER (12)

NAME <b>Richard H. Blount, Site Vice President</b>	TELEPHONE NUMBER (Include Area Code) <b>(757) 365-2000</b>
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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
N/A									

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	NO X	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 3, 2003, it was determined that assumption of the RCP seal leakage model from WCAP-15603, Rev. 1-A would result in the inability to maintain pressurizer level during plant shutdown, thus not satisfying 10CFR50 Appendix R. This condition could result from a loss of RCP seal cooling due to postulated fire damage in certain Unit 1 emergency switchgear room fire scenarios. The charging pump cross-connect was considered inoperable with respect to Appendix R due to these circumstances, and the appropriate actions required by the Technical Requirements Manual (TRM) were entered. An eight-hour non-emergency report to the NRC was made in accordance with 10CFR50.72(b)(3)(ii)(B). Along with establishing the TRM-required fire watch, additional interim measures were implemented on November 4, 2003. A justification for continued operation, which reestablishes compliance with Appendix R, was implemented on November 10, 2003 and will remain in place until permanent resolution is implemented. This condition occurred because WCAP-15603, Rev. 1-A was recognized as being appropriate to consider for probabilistic risk assessment modeling, but was not viewed as applicable to Appendix R analyses. There were no significant safety consequences or implications associated with this condition. This report is being submitted pursuant to 10CFR50.73(a)(2)(ii)(B).

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

**1.0 DESCRIPTION OF THE EVENT**

On March 31, 2003, the NRC issued Inspection Report 50-280/03-07 and 50-281/03-07 documenting the Triennial Fire Protection Inspection at Surry Power Station. The inspection identified an unresolved item (URI) related to a fire in the Unit 1 Emergency Switchgear Room (ESGR). The URI documented that certain Unit 1 ESGR fire scenarios and the postulated fire damage could result in the loss of reactor coolant pump (RCP) seal cooling, RCP seal package damage, and subsequently a seal loss of coolant accident. This issue was unresolved pending completion of a significance determination.

As part of the significance determination process (SDP) related to the URI, NRC personnel visited Surry in October 2003. During that visit, additional information was gathered by the NRC, and the NRC's preliminary SDP Phase III assessment was discussed. This NRC assessment used the RCP seal leakage model documented in Topical Report WCAP-15603, Rev. 1-A, titled "WOG 2000 Reactor Coolant Pump Seal Leakage Model for Westinghouse PWRs". The NRC's Safety Evaluation of this Topical Report, dated May 20, 2003, requires consideration of a 20% probability that hot seals may result in an increased leakage up to 182 gpm per pump if seal cooling is lost for more than 13 minutes. In contrast to this WCAP-15603, Rev. 1-A model, the current Appendix R analyses for Surry assume the RCP seal leakage is 21 gpm for up to 70 minutes. This leakage value is based on WCAP-10541, Rev. 2, titled "Reactor Coolant Pump Seal Performance Following a Loss of All AC Power" (November 1986), which considered full-scale test results. The Appendix R, Section III.L.2.b requirement to maintain pressurizer level during plant shutdown is met assuming the 21 gpm seal leakage value.

Based on review and consideration of the WCAP-15603, Rev. 1-A RCP seal leakage model, it was determined that assumption of that model's RCP seal leakage for greater than 13 minutes would result in an inability to maintain pressurizer level during plant shutdown, thus not satisfying the 10CFR50 Appendix R, Section III.L.2.b requirement. At the time of this determination, Unit 1 was operating at 100% power and Unit 2 was at cold shutdown. Following this determination, an eight-hour non-emergency report to the NRC was made at 1736 hours on November 3, 2003 in accordance with 10CFR50.72(b)(3)(ii)(B). Similarly, this report is being submitted pursuant to 10CFR50.73(a)(2)(ii)(B) for a condition that resulted in an unanalyzed condition that significantly degraded plant safety.

**2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

One of the interim measures put in place was periodic thermal imaging to detect hot spots on energized equipment identified to be critical with respect to a fault of the type

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postulated in the Appendix R Unit 1 ESGR fire scenarios of concern. As noted in Section 4.0, existence of hot spots could be a precursor of electrical equipment degradation or potential failure. The baseline results from the thermal imaging found no abnormalities in the temperature of the critical equipment.

Furthermore, a preliminary probabilistic risk assessment (PRA) has been performed which indicates that the risk of core damage from fires in the ESGR leading to RCP seal leakage beyond the RCS makeup capacity are less than 3E-6 per year. This contribution to risk is considered small in accordance with NRC Regulatory Guide 1.174.

Given these considerations, the interim measures and actions discussed in Sections 4.0 and 5.0, and the fact that an ESGR fire did not occur, this condition resulted in no significant safety consequences or implications, and the health and safety of the public were not affected at any time.

**3.0 CAUSE**

WCAP-15603, Rev. 1-A was distributed to Dominion by Westinghouse Owners Group (WOG) letter WOG-03-340, dated July 7, 2003. This distribution was to Dominion representatives on the WOG Management Committee, the WOG Systems & Equipment Subcommittee, and the WOG Risk Management Subcommittee. Review of this information concluded that it was appropriate for consideration with respect to Surry's PRA modeling. However, given the nature of the WCAP, it was not viewed as applicable from a deterministic perspective, including in Appendix R analyses. Therefore, the Appendix R analyses were not revised to reflect the WCAP-15603, Rev. 1-A model.

Note that the WOG is reviewing the Surry circumstances and the application of WCAP-15603, Rev. 1-A in Appendix R analyses. A preliminary indication from the WOG is that the use of the WCAP-15603 model in a deterministic manner is a misapplication of a bounding PRA model that was developed to support risk-informed applications. We will monitor the WOG's review activities for potential impact on the actions already taken or planned.

**4.0 IMMEDIATE CORRECTIVE ACTION(S)**

Upon determination that the NRC's Safety Evaluation for WCAP-15603, Rev. 1-A applied a RCP seal leakage value of 182 gpm per pump during an Appendix R fire/loss of RCP seal cooling event, a Plant Issue/Deviation was issued. The Deviation was issued because the 182 gpm value exceeds the 21 gpm rate assumed in the current Appendix R analyses and would result in an inability to maintain pressurizer level during plant shutdown.

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The charging pump cross-connect was considered inoperable with respect to 10CFR50 Appendix R due to these circumstances. Technical Requirements Manual (TRM) requirements were applicable and specified that a fire watch be implemented within 14 days and that inoperable equipment be restored to operable status within 60 days. The TRM required actions for charging pump cross-connect inoperability were entered at 1720 hours on November 3, 2003. The TRM-required fire watch was established at 1720 hours on November 4, 2003, and the 14-day action was exited.

In addition to applying the TRM requirements, the following interim measures were also implemented on November 4, 2003:

- To prevent a fault of the type postulated in the Appendix R Unit 1 ESGR fire scenarios of concern, periodic thermal imaging was initiated to detect hot spots on energized equipment identified to be critical. Existence of hot spots could be a precursor of electrical equipment degradation or potential failure.
- A Fire Safety Alert was issued identifying the need for increased monitoring of fire risk in the ESGR and requiring a Transient Fire Loading Permit (approved by Safety and Loss Prevention with Operations Department Manager concurrence) for transient combustibles being brought into the ESGR. Permit approval required a continuous fire watch with portable fire fighting equipment.
- Once per shift walkdowns of the ESGR by Operations personnel were instituted to ensure no condition existed that could contribute to the start or spread of a fire.

The thermal imaging and Operations walkdowns interim measures remained in place until a justification for continued operation (JCO), discussed in Section 5.0, was approved and implemented. The Fire Safety Alert interim measures will remain in place until a revision to the fire protection administrative procedure is made to address transient combustible controls commensurate with the significance of the fire area.

**5.0 ADDITIONAL CORRECTIVE ACTIONS**

A JCO to ensure restoration of RCP seal cooling within 13 minutes was developed and approved on November 8, 2003. The JCO includes a temporary modification (tagging of numerous components in a specified position) and administrative controls (to open two valves as directed by the Main Control Room). In the event of a fire in the ESGR, the administrative control actions would be taken to complete alignment of the RCP seal injection flowpath from the unaffected unit through the charging pump cross-connect to the RCP seals on the affected unit. The JCO measures reestablish compliance with the requirements of 10CFR50 Appendix R, Section III.L. Following completion of the necessary training, the JCO was implemented on November 10, 2003, and the 60-day TRM action was exited.

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**6.0 ACTIONS TO PREVENT RECURRENCE**

A request for engineering assistance (REA) will be developed to address permanent resolution of this Appendix R concern regarding loss of RCP seal cooling. The JCO, currently in place, will remain in place until permanent resolution is defined and implemented.

**7.0 SIMILAR EVENTS**

None.

**8.0 MANUFACTURER/MODEL NUMBER**

Not applicable.

**9.0 ADDITIONAL INFORMATION**

The Unit 2 fire modeling and analysis is ongoing. It is anticipated that Unit 2 will be similarly affected. The corrective actions discussed in Sections 4.0 and 5.0 were implemented on both Units 1 and 2.