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NL-03-1819

September 11, 2003

Docket No.: 50-424

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

**Vogtle Electric Generating Plant  
Licensee Event Report 1-2003-001  
Debris in Containment Could Have Resulted  
in Safety System Loss of Function**

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73, Southern Nuclear Operating Company hereby submits a Vogtle Electric Generating Plant Licensee Event Report (LER) for a condition that occurred on April 6, 2002.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

Jeffrey T. Gasser

JTG/NJS/daj

Enclosure: LER 1-2003-001

cc: Southern Nuclear Operating Company  
Mr. J. D. Woodard, Executive Vice President  
Mr. W. F. Kitchens, General Manager – Plant Vogtle  
Mr. M. Sheibani, Engineering Supervisor – Plant Vogtle  
Document Services RTYPE: CVC7000

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. F. Rinaldi, NRR Project Manager – Vogtle  
Mr. J. Zeiler, Senior Resident Inspector – Vogtle

IE22

**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: 60 hrs. 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,

1. FACILITY NAME  
Vogtle Electric Generating Plant – Unit 1

2. DOCKET NUMBER  
05000-424

3. PAGE  
1 OF 4

4. TITLE  
Debris in Containment Could Have Resulted in Safety System Loss of Function

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
04	06	02	2003	001	00	09	11	2003		05000
										05000

9. OPERATING MODE	10. POWER LEVEL	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check all that apply)			
3	0	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(iii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
		<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)
		<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 73.71(a)(4)
		<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(5)
		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(B)	OTHER
		<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A
		<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	
		<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	
		<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
		<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER  
 NAME: Mehdi Sheibani, Nuclear Safety and Compliance  
 TELEPHONE NUMBER (Include Area Code): (706) 826-3209

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

14. SUPPLEMENTAL REPORT EXPECTED  
 YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

15. EXPECTED SUBMISSION DATE  
 MONTH: DAY: YEAR:

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

On July 28, 2003, an evaluation was completed that determined a safety system functional failure could have occurred on April 6 & 7, 2002, following the 1R10 refueling outage. Specifically, it was determined that the containment building held debris in an amount adequate to block the containment sump screens, which could result in inadequate net positive suction head and possible failure of the residual heat removal (RHR) pumps to perform at design limiting conditions. This may have occurred following a design basis accident had these pumps been called on to operate and draw suction from the containment sumps. The condition existed for a period of 37 hours and 12 minutes while the unit was subcritical, until a containment cleanliness walkdown removed enough of the debris to reduce the cross-sectional area of the sump screen blockage to an acceptable level. The July 28, 2003, evaluation included expanded insulation destruction due to missing insulation jacketing which increased the insulation debris contributing to sump blockage.

The cause of this event was inadequate removal of debris from the Unit 1 containment building prior to Mode 4 (hot shutdown) heat-up. Debris was removed prior to the unit's return to power operations.

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

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Vogtle Electric Generating Plant - Unit 1	05000-424	2003	-- 001	-- 00	2 OF 4

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

**A. REQUIREMENT FOR REPORT**

This event is reportable per 10 CFR 50.73 (a)(2)(v)(B) because a condition existed that could have prevented the fulfillment of the safety function of a system needed to remove residual heat. It is also reportable per 10 CFR 50.73 (a)(2)(i)(B) because the unit operated in a condition prohibited by the Technical Specifications when a surveillance task was inadequately performed.

**B. UNIT STATUS AT TIME OF EVENT**

At the time of this event on April 6, 2002, Unit 1 was in Mode 4 (hot shutdown) at ambient temperature and at 0 percent of rated thermal power coming out of the 1R10 refueling outage. Other than that described herein, there was no inoperable equipment that contributed to the occurrence of this event.

**C. DESCRIPTION OF EVENT**

On July 28, 2003, an evaluation was completed that determined a safety system functional failure could have occurred following the 1R10 refueling outage on April 6 & 7, 2002. Specifically, it was determined that the containment building held debris in an amount adequate to block the containment sump screens, which could result in inadequate net positive suction head and possible failure of the residual heat removal (RHR) pumps to perform at design limiting conditions. This may have occurred following a design basis accident had these pumps been called on to operate and draw suction from the containment sumps. The condition existed for a period of 37 hours and 12 minutes while the unit was in Mode 4 (hot shutdown) and Mode 3 (hot standby), until the loose debris was removed. A walkdown to verify containment cleanliness removed the miscellaneous loose debris which reduced the cross-sectional area of sump screen blockage to an acceptable level.

At the end of the Unit 2 refueling outage in November 2002, an engineer noticed unjacketed torn insulation at the bottom of the steam generators and raised the prospect that, following a design basis accident, some of the insulation could travel to the containment sump and lead to sump screen blockage. An investigation by design engineering found that additional insulation should be considered destroyed due to the missing jacketing which increases the amount of debris that could travel to the sump screen following the design basis accident. When taking into account the additional sump screen blockage that would be incurred by the insulation, along with other containment debris, design engineering determined that adequate net positive suction head still existed in November 2002 for both the containment spray pumps and the residual heat removal pumps. Therefore, no reportable condition existed.

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

As a result of reduced NPSH margin, design engineering then began to review previous startups from refueling outages to determine if debris found in containment after each outage, combined with the additional insulation, could have led to sump screen blockage following a design basis accident. Potential events were identified and an evaluation of these events was performed to determine the impact on NPSH margin. The results of this review found one event in the last three years where sump screen blockage could have been sufficient to cause inadequate net positive suction head for the RHR pumps. This event occurred on April 6 & 7, 2002, as stated previously.

**D. CAUSE OF EVENT**

The cause of this event was inadequate removal of debris from the Unit 1 containment building prior to Mode 4 entry. Contributing to this were personnel errors by licensee personnel who performed inadequate walkdowns to ensure that all debris had been removed.

Another contributing factor to the occurrence of this event was the inadequate calculation for sump screen blockage allowable limits by the original architect/engineer. The addition of insulation to the allowable sump screen blockage calculations requires that less loose debris be left in containment, raising the standards for containment cleanup requirements.

**E. ANALYSIS OF EVENT**

At the time of this event, approximately one-half of the subcritical core consisted of new fuel. The remainder had been removed from the previous core and the fission process for more than a month. Based on these factors, the reactor core possessed a minimal amount of decay heat.

The total time of this event of 37 hours and 12 minutes represents a narrow window of opportunity for a design basis LOCA to have occurred, severely reducing the probability of such an event.

Finally, an assumption was made that 100% of the insulation material destroyed during a design basis LOCA would migrate to the sump. This assumption is overly conservative as documented in recent NUREGs. Design engineering believes that the insulation debris created during a LOCA at the operating temperature and pressure stated above would be greatly reduced from that of the design basis LOCA. Insulation destruction is based on testing from a jet blast from a water/steam source at 590°F and 1595 psi. Testing information for insulation destruction at the reduced operating temperature and pressure existing during this event is not available. Additionally, much of the insulation debris will not transport to the sump as it will be caught up on grating, equipment, and pocket areas in containment.

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

Based on these considerations, there was no adverse effect on plant safety or on the health and safety of the public as a result of this event.

This event could have resulted in a safety system functional failure.

**F. CORRECTIVE ACTIONS**

- 1) Sufficient debris was removed from containment on April 7, 2002, to enable net positive suction head requirements to be met for the RHR pumps.
- 2) The calculation for sump screen blockage allowable limits has been revised to include the contribution from the steam generator insulation.
- 3) Cleanliness walkdowns prior to Mode 4 entry continue to be performed. Additionally, in the interval since this event occurred, management has stressed cleaning up following individual jobs in the containment building rather than waiting for a walkdown prior to Mode 4 entry to clean up the entire building. This practice of maintaining cleanliness is believed to be a more effective method of ensuring debris is not left behind.
- 4) Other means for preventing containment sump blockage are detailed in the Vogtle Electric Generating Plant's Response to NRC Bulletin 2003-01 dated August 7, 2003.

**G. ADDITIONAL INFORMATION**

- 1) Failed Components:  
None
- 2) Previous Similar Events:  
There have been no previous similar events in the last three years.
- 3) Energy Industry Identification System Code:  
Containment Spray System - BE  
Residual Heat Removal System - BP  
Containment Sumps - NH