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Energy to Serve Your World™

NL-03-2401

December 5, 2003

Docket Nos.: 50-424
50-425

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

Vogtle Electric Generating Plant
Licensee Event Report 2-2002-001-01
Inadequately Staked Capscrews Render Residual Heat
Removal Pumps Inoperable

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), Revision 1 for a condition that occurred at Unit 2 on October 22, 2002. This submittal revises the original LER submittal referenced below. As a corrective action noted in the original submittal, Unit 1 was to be examined during the Fall 2003 refueling outage. This examination noted a similar condition resulting in this revision.

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

Sincerely,



Jeffrey T. Gasser

JTG/KWK/daj

Reference: LCV-1640 dated December 20, 2002

Enclosure: LER 2-2002-001-01

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

JE22

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 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 2

2. DOCKET NUMBER

05000-425

3. PAGE

1 OF 4

4. TITLE

INADEQUATELY STAKED CAPSCREWS RENDER RESIDUAL HEAT REMOVAL PUMPS INOPERABLE

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)	
10	22	2002	2002	001	01	12	05	2003	VEGP Unit 1	05000424	
									FACILITY NAME	DOCKET NUMBER(S)	
										05000	
9. OPERATING MODE		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check all that apply)									
0		20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)			50.73(a)(2)(ix)(A)
10. POWER LEVEL		20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)			50.73(a)(2)(x)
0		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)			X 50.73(a)(2)(v)(B)			X OTHER
		20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)			Specify in Abstract below
		20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)			or in NRC Form 366A
		20.2203(a)(2)(v)			X 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)			

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
B	BP	P	I075	Yes					

14. SUPPLEMENTAL REPORT EXPECTED

YES

(If yes, complete EXPECTED SUBMISSION DATE)

X NO

15. EXPECTED SUBMISSION DATE

MONTH

DAY

YEAR

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

At Unit 2 on October 22, 2002, while defueled, residual heat removal (RHR) pump A was started for dynamic fill and vent of the RHR system. Moments later, the pump tripped. An investigation determined that a back casing ring capscrew had come loose and lodged between the impeller and the back casing ring. It was found that the pump was last operated on October 11, 2002, when the unit was in Mode 6 (Refueling). It is believed that the capscrew came loose and lodged between the impeller and the back casing ring as the pump was being placed into standby status on October 11th. Because two pumps are required to be operable at certain times in Mode 6, this represented operation in a condition prohibited by the Technical Specifications. Because the other RHR pump was also found to have inadequately staked capscrews, this represented a condition that could have prevented the fulfillment of the safety function of a system needed to remove residual heat. This condition is also reportable per 10 CFR 21.21 because similar back casing rings with inadequately staked capscrews were found in the warehouse. Inadequately staked capscrews were also found in the Unit 1 Train B RHR pump during the fall 2003 refueling outage.

The root cause of this event was determined to be the failure of the manufacturer to properly stake the back casing ring capscrews. The capscrews on the back casing rings for the affected RHR pumps were properly staked prior to the pumps being returned to service and the Units returning to Mode 6.

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TEXT CONTINUATION

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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)(i)(B) because the unit was operated in a condition prohibited by the Technical Specifications (TS) for a period of 6 hours and 31 minutes. It is also 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. Furthermore, this report is being made per the requirements of 10 CFR 21.21 because defective components were procured whose use could have led to the creation of a substantial safety hazard.

B. UNIT STATUS AT TIME OF EVENT

At the time of the discovery of this event, the units were defueled at 0 percent of rated thermal power. In Unit 2, personnel were preparing for fill and vent of the residual heat removal (RHR) system. In Unit 1, personnel were specifically looking for this condition. Other than that described herein, there was no inoperable equipment that contributed to the occurrence of this event.

C. DESCRIPTION OF EVENT

At Unit 2 on October 22, 2002, while defueled, residual heat removal (RHR) pump A was started for dynamic fill and vent of the RHR system. Moments later, the pump tripped.

Personnel found that the pump shaft could not be hand turned. An investigation determined that a back casing ring capscrew had come loose and lodged between the impeller and the back casing ring.

It was found that the pump was last operated on October 11, 2002, when the unit was in Mode 6 (Refueling). It is believed that the capscrew came loose and lodged between the impeller and the back casing ring as the pump was being placed into standby status on October 11th.

D. CAUSE OF EVENT

The root cause of this event was determined to be the failure of the manufacturer to properly stake the back casing ring capscrews. Each capscrew is torqued and staking performed as a redundant measure to hold the capscrews in place. Although staking had been performed for the back casing rings inspected, it was inadequate to prevent at least one of the capscrews from backing out of the casing ring after it had lost its torque and become loose.

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

RHR pump B was inspected and found to have a similar condition. Spare back casing rings in the warehouse were also inspected and found to have a similar condition of inadequately staked capscrews. In Unit 1, on October 7 & 8, 2003, both RHR pumps were inspected and the Train B pump was found to have inadequately staked capscrews.

E. ANALYSIS OF EVENT

From the period of time when the Unit 2 RHR pump A was stopped on October 11, 2002, at 1017 EST until the reactor cavity water level was raised to 23 feet above the vessel flange at 1648 EST, Unit 2 operated in a condition prohibited by TS 3.9.6 because two RHR pumps were not maintained operable. However, the system safety function continued to be met because RHR pump B remained operable.

The spare back casing rings in the warehouse were not placed into service with the inadequately staked capscrews and did not create a substantial safety hazard.

In addition, the improperly staked capscrews on the three affected RHR pumps in both Unit 1 and Unit 2 represented a condition that could have prevented fulfillment of a safety function of a system needed to remove residual heat. Discussions with pump vendor personnel determined that there are approximately 60 of these pumps in service in the nuclear industry, most with several years of service, and that this was the first failure of this type. Additionally, 15 of these pumps, including the 4 in Units 1 & 2, have undergone a coupling modification in recent years that replaced the back casing ring. However, it is not known if the back casing ring defect is limited to only those casing rings that were procured for the modifications or if the original pump back casing rings also possess this defect. Nonetheless, this was the first failure of this type for any of the 60 pumps, providing assurance that this event was an isolated occurrence and that RHR pump B was unlikely to also fail due to this mechanism.

Initially, it was not known if the Unit 1 RHR pumps had a similar condition of improperly staked capscrews. However, the following facts were known:

- As described above, the unlikeliness of this occurrence was reflected in the hundreds of pump service years by this type of pump in the nuclear industry, with no similar events of a capscrew jamming an impeller.
- Per discussion with the vendor, a loose capscrew was more likely to be discharged from an operating pump rather than be caught in the impeller, as occurred here.
- A methodology was developed to ensure the Unit 1 RHR pumps remained operable following each run to ensure that no capscrews jammed the impellers.

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

These facts provided assurance that the Train B Unit 1 pump would continue to function until it was inspected and repaired during the Fall 2003 refueling outage.

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 represents a safety system functional failure.

F. CORRECTIVE ACTIONS

- 1) The capscrews on the back casing rings for both Unit 2 RHR pumps were properly staked prior to the pumps being returned to service and the Unit returning to Mode 6.
- 2) The supplier of the spare back casing rings in the warehouse was advised of the defect. The casing rings themselves were returned to the vendor for reworking.
- 3) A methodology was developed by January 20, 2003, to ensure the Unit 1 RHR pumps remained operable after each pump run to ensure the impellers did not become jammed.
- 4) Each of the Unit 1 pump's back casing rings were inspected during the Fall 2003 refueling outage. Inadequately staked capscrews were found on the Train B RHR pump. They were properly staked and the pump returned to service.

G. ADDITIONAL INFORMATION

- 1) Failed Components:
RHR pump manufactured by Ingersoll-Rand, Model number 8X20WDF.
Back casing ring part number: 6B.
Capscrew: 118C.
- 2) Previous Similar Events:
There have been no previous similar events in the last two years.
- 3) Energy Industry Identification System Code:
Residual Heat Removal System - BP
Reactor Coolant System - AB