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Georgia Power
the southern electric system

C. K. McCoy
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LCV-0910-A

January 22, 1997

Docket Nos. 50-424

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

Ladies and Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
REVISION TO LICENSEE EVENT REPORT 1-96-10
SAFETY INJECTION PUMP RENDERED INOPERABLE
DUE TO LACK OF MOTOR COOLING

In accordance with the requirements of 10 CFR 50.73, Georgia Power Company (GPC) hereby submits a revison to a Vogtle Electric Generating Plant licensee event report originally submitted to the NRC on November 27, 1996.

Sincerely,

C. K. McCoy

CKM/NJS

Enclosure: LER 1-96-10, Revision 1

xc: Georgia Power Company
Mr. J. B. Beasley, Jr.
Mr. M. Sheibani
NORMS

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. L. L. Wheeler, Licensing Project Manager, NRR
Mr. C. R. Ogle, Senior Resident Inspector, Vogtle

IE22

NRC FORM 366 (4-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REQUIRED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

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TITLE (4)
SAFETY INJECTION PUMP RENDERED INOPERABLE DUE TO LACK OF MOTOR COOLING

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(S)
1 1	0 1	9 6	9 6	0 1 0	0 1	0 1	2 2	9 7		0 5 0 0 0
									FACILITY NAME	0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	1 0 0

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

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

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (include area code)
Mehdi Sheibani, Nuclear Safety and Compliance	AREA CODE 7 0 6 8 2 6 - 3 2 0 9

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

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-space typewritten lines) (16)

An investigation of temperature differences between the Unit 1 safety injection pump (SIP) B motor coolers discovered that the motor cooling for this pump had been significantly degraded due to improper gasket installation and incorrect assembly of the motor coolers. On November 1, 1996, design engineering personnel completed an evaluation and were able to determine that SIP B would not be able to perform its intended safety function. Therefore, the unit had operated in a condition prohibited by the Technical Specifications because both SIPs are required to be in service when the unit is in Modes 1, 2, or 3.

On November 6, 1996, a review was completed that found occasions when SIP A was out of service and SIP B was relied on to perform the safety injection function. Therefore, an unanalyzed condition had existed, when SIP A was out of service, that significantly compromised plant safety. The NRC Operations Center was notified.

The causes of this event were improper gasket installation and inadequate procedural guidance resulting in incorrect assembly of the motor coolers in 1991 or earlier. The motor coolers were reassembled properly and SIP B was returned to service.

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

A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73 (a)(2)(ii)(A) because an unanalyzed condition existed that significantly compromised plant safety. In addition, this is reportable per 10 CFR 50.73 (a)(2)(i)(B) because the unit operated in a condition prohibited by the Technical Specifications (TS) when both safety injection pumps were inoperable.

B. UNIT STATUS AT TIME OF EVENT

At the time of the discovery of this event on November 1, 1996, Unit 1 was operating in Mode 1 (power operation) at 100 percent of rated thermal power. Other than that described herein, there was no inoperable equipment that contributed to the occurrence of this event.

C. DESCRIPTION OF EVENT

On October 15, 1996, a plant equipment operator noticed that the return line to one of the two Unit 1 safety injection pump (SIP) B motor coolers was warmer than the other. Since the coolers are supplied by a common header and there is no isolation capability, personnel were unable to explain the different temperatures and a work order was written to investigate. On October 22, 1996, one of the two Unit 1 SIP B motor coolers was disassembled and personnel found its tubesheet was blanked off with gasket material.

During disassembly/reassembly, personnel noted the possibility of reversing the plenum and determined that a plan was warranted for checking other motor coolers. A field verification of temperature differentials of similar safety related motor coolers was initiated and on October 24, 1996, the Unit 2 containment spray pump (CSP) Train A motor cooler was found to have a reversed plenum which resulted in reduced cooling capacity for the motor cooler heat exchanger. On October 25, 1996, personnel inspected the other Unit 1 SIP B motor cooler to ensure proper plenum installation and found this cooler also had a reversed plenum. The effect of this configuration was that cooling water flow made only one pass through this Unit 1 SIP B motor cooler rather than the design of three passes through the cooler. Therefore, cooling of the Unit 1 SIP B motor was significantly reduced from the design basis.

On November 1, 1996, design engineering personnel completed an evaluation and were able to determine that Unit 1 SIP B would not perform its intended safety function due to a significant loss

of motor cooling through the two motor coolers. Therefore, the unit had operated in a condition prohibited by the Technical Specifications because both SIPs are required to be in service when the unit was in Modes 1, 2, or 3.

On November 6, 1996, a review was completed that found occasions on Unit 1 when SIP A was out of service and SIP B was relied on to perform the safety injection function. At 0912 EST, it was determined that an unanalyzed condition had existed, when Unit 1 SIP A was out of service, that significantly compromised plant safety. The NRC Operations Center was notified of this condition at 0949 EST.

On November 12, 1996, design engineering personnel completed an evaluation of a Unit 1 SIP B failure scenario. The evaluation showed that adequate cooling remained available to prevent the motor winding failure. However, motor bearing failure due to elevated temperatures could be expected to occur following 1-2 hours of pump operation after the bearing reached these elevated temperatures. Therefore, this condition significantly compromised plant safety because the design assumes that a safety injection pump is required for approximately 24 hours following an accident.

On November 20, 1996, an engineering evaluation determined the reduced Unit 2 CSP A motor cooling capacity was sufficient to prevent winding or bearing failure. Therefore, the Unit 2 CSP A would have been capable of performing its intended safety function.

D. CAUSE OF EVENT

The causes of this event were improper gasket installation and inadequate procedural guidance resulting in incorrect assembly of the motor coolers. A review of work orders determined that the as-found motor cooler assemblies' configurations had been in place at least since 1991, and possibly since original construction. In addition, no specific functional testing of heat exchangers had been performed which could have identified the installation errors.

E. ANALYSIS OF EVENT

While SIP B was incapable of performing its intended safety function, the incidence of SIP A unavailability during unit operation in Modes 1, 2, or 3, was found to average approximately 2 and 1/2 hours per year. This condition was addressed by performing an evaluation of the VEGP probabilistic safety assessment (PSA) model which assumed an unavailability of 10 hours per year.

This evaluation determined that the impact on the annual VEGP core damage frequency (CDF) due to the inadvertent unavailability of SIP B for an entire year, would be an increase of about 5.3 percent. Also from a review of the PSA model, it was concluded that this condition does not significantly amplify the impact on CDF resulting from any concurrent normal equipment maintenance, such as charging pumps, RHR pumps, or SIP A. It was also determined that this condition caused the calculated annual VEGP large early release frequency (LERF) to increase by approximately 48 percent. The accident sequences causing this increase are related to the likelihood of core damage following a steam generator tube rupture event. From the current evaluation, as a percentage of CDF, the contribution of this LERF would only increase to 5.2 percent, which amounts to a negligible impact on the overall VEGP containment performance capability.

In addition, Westinghouse evaluated the VEGP small break loss-of-coolant accident (SB LOCA) for the impact of the loss of an SI pump. The existing VEGP SB LOCA analysis of record (AOR) was performed with the 1985 Westinghouse Small Break LOCA Accident Evaluation Model using the NOTRUMP code. Since that time, a new methodology has been approved by the NRC for use which features improvements that lead to increased ECCS flow to the reactor coolant system (RCS) as well as enhanced depressurization in the RCS. Westinghouse used this new methodology in their evaluation of this event for VEGP. Specifically, a generic Westinghouse pressurized water reactor input deck was used with VEGP specific centrifugal charging pump and SIP flows. First, an evaluation was performed to demonstrate that the generic model with VEGP specific flows was sufficiently close to the VEGP SB LOCA AOR for comparison purposes. Having successfully demonstrated a valid comparison, a range of postulated break sizes of 1.5", 2.0", and 3.0" was evaluated to confirm the limiting break size. The limiting single failure of loss of a complete train of ECCS was assumed, and the remaining operating SIP was assumed to fail after one hour. The one-hour time frame was based on a conservative engineering evaluation of the impact of loss of motor cooling on the SIP motor. It was determined that the SIP motor could be conservatively expected to operate for at least one hour. The results of the evaluation demonstrated a limiting peak clad temperature of 1936^{0} F, which demonstrates that adequate margin to the 10 CFR 50.46 limits remain.

Finally, there was no event during the period involved that required safety injection.

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

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F. CORRECTIVE ACTIONS

1) The gasket that blanked off the Unit 1 SIP B motor cooler tubesheet was removed and a properly cut gasket was installed. The plenums were correctly aligned on both the Unit 1 SIP B motor coolers, and the Unit 2 CSP A. Both pumps were returned to service.

2) Upon discovery, a field verification of temperature differentials of other similar safety related motor coolers was performed with no problems detected. Subsequent additional inspections have confirmed correct plenum orientations, and the plenums were permanently marked accordingly. When the inspection scope was expanded to non-safety related pumps, reversed plenums were found on one of the two non-safety related auxiliary component cooling water (ACCW) system pumps on each unit. These were subsequently corrected.

3) A maintenance procedure for proper plenum installation and motor cooler assembly of Westinghouse large frame water cooled motors has been developed.

4) This event and instructions on the new maintenance procedure will be included in maintenance continuing training. This training is scheduled to be completed by May 1, 1997.

5) An evaluation of the impact to the qualified life of the Unit 1 SIP B motor was performed and concluded there was only an insignificant reduction in the motor's qualified life. Since the Unit 2 CSP A motor cooling was found to be sufficient, no reduction in the Unit 2 CSP A motor's qualified life resulted.

6) An evaluation will be completed by January 31, 1997, to determine the appropriate functional test following cooler reassembly.

7) Technical manuals have been revised to provide guidance on proper installation of the cooler plenums. In addition, other nuclear power plants known to have been supplied with these motors have been individually advised of the potential for operation with reversed plenums.

G. ADDITIONAL INFORMATION

1) Failed Components:
None

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

2) Previous Similar Events:
None

3) Energy Industry Identification System Code:
Safety Injection System - BQ
Containment Spray System - BE
Auxiliary Component Cooling Water System - CC