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Georgia Power

the southern electric system

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X7GJ17-V110

July 11, 1988

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

PLANT VOGTLE - UNITS 1, 2
NRC DOCKETS 50-424, 50-425
OPERATING LICENSE NPF-68
CONSTRUCTION PERMIT CPPR-109
INTERIM RESPONSE TO BULLETIN 88-04
POTENTIAL SAFETY-RELATED PUMP LOSS

Gentlemen:

The subject NRC Bulletin (NRCB) 88-04, "Potential Safety-Related Pump Loss", dated May 5, 1988, requested that Georgia Power Company (GPC) investigate and correct, as applicable, two concerns related to the design of the minimum flow lines of safety related system pumps. Specifically, the concerns involve the adequacy of the miniflow capability, and the potential for a pump to "dead-head" when it is operating in the minimum flow (miniflow) mode in parallel with another pump. GPC was requested to provide, within 60 days of receipt of NRCB 88-04, a response that (a) summarizes the problems and the systems affected, (b) identifies the short-term and long-term modifications to plant operating procedures or hardware that have been or are being implemented, (c) identifies an appropriate schedule for long-term resolution of this problem, and (d) provides justification for continued operation particularly with regard to General Design Criterion 35 of Appendix A to Title 10 of the Code of Federal Regulations (10 CFR 50), "Emergency Core Cooling", and 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors." GPC hereby provides our response to this bulletin as an enclosure to this letter.

GPC has concluded that the concerns raised by this bulletin are not a short term problem at Plant Vogtle. We note that the the performance of the subject Unit 1 safety-related centrifugal pumps is monitored through

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the Inservice Testing Program. This provides additional assurance that premature pump degradation will be identified, evaluated and corrected.

If you have any further questions in this regard, please contact this office.

Mr. W. G. Hairston, III, states that he is Senior Vice President of Georgia Power Company and is authorized to execute this oath on behalf of Georgia Power Company, and that to the best of his knowledge and belief the facts set forth in this letter are true.

GEORGIA POWER COMPANY

By: W. G. Hairston III
W. G. Hairston, III
Senior Vice President,
Nuclear Operations

Sworn to and subscribed before me this 11th day of July 1988.

Mae H. Sattler
Notary Public Notary Public, Fulton County, Ga.
My Commission Expires Nov. 2, 1991

WEB:lm

Enclosure: Response to NRCB 88-04 for Plant Vogtle

c: Georgia Power Company
Mr. P. D. Rice, Vice President and Vogtle Project Director
Mr. G. Bockhold, Jr., General Manager - Plant Vogtle
GO-NORMS

U. S. Nuclear Regulatory Commission, Washington D.C.
Mr. J. B. Hopkins, Licensing Project Manager - Vogtle (2 copies)

U. S. Nuclear Regulatory Commission, Region II
Dr. J. N. Grace, Regional Administrator
Mr. J. F. Rogge, Senior Resident Inspector, Operations - Vogtle
Mr. R. J. Schepens, Senior Resident Inspector, Construction - Vogtle

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ENCLOSURE

INTERIM RESPONSE TO BULLETIN 88-04
POTENTIAL SAFETY-RELATED PUMP LOSS

NRCB 88-04 addressed two potential problems related to safety-related centrifugal pump miniflow operations. These problems and the systems/pumps affected at Plant Vogtle are identified below.

The first potential problem involves parallel pump operation with both pumps recirculating through a common miniflow line or with a piping configuration that does not preclude pump-to-pump interaction during miniflow operation. Unit 1 and Unit 2 safety-related centrifugal pumps with such a piping configuration are listed below:

CVCS Charging Pumps:	1-1208-P6-002
	1-1208-P6-003
	2-1208-P6-002
	2-1208-P6-003

Safety Injection Pumps:	1-1204-P6-003
	1-1204-P6-004
	2-1204-P6-003
	2-1204-P6-004

Boric Acid Transfer Pumps:	1-1208-P6-006
	1-1208-P6-007
	2-1208-P6-006
	2-1208-P6-007

Safety-related centrifugal pumps in Emergency Core Cooling systems having a common miniflow configuration were previously evaluated with respect to the concerns of NRC I.E. Notice 87-59. In these reviews, Westinghouse extracted pump pressures and flows from vendor supplied shop pump performance curves and applied that data to the existing piping configurations at Units 1 and 2. The results of those reviews are summarized below:

CVCS charging pump normal operation and emergency miniflow operation: it was determined that the existing miniflow configuration allows for sufficient flow and that simultaneous operation of the pumps on miniflow will not result in dead-heading either of the pumps.

Safety Injection Pump normal operation: it was determined that the existing miniflow configuration allows for sufficient flow and that simultaneous operation of the pumps on miniflow will not result in dead-heading one of the pumps.

ENCLOSURE (Continued)

INTERIM RESPONSE TO BULLETIN 88-04
POTENTIAL SAFETY-RELATED PUMP LOSS

Simultaneous operation of two CVCS Charging Pumps and two Safety Injection Pumps on miniflow to the RWST: it was determined that the existing miniflow configuration allows for sufficient flow and that simultaneous operation of the pumps on miniflow will not result in dead-heading any of the pumps.

The Boric Acid Transfer Pump normal operation was reviewed by GPC against the concerns of NRCB 88-04. The miniflow line is orificed to accommodate single pump miniflow operation only. However, if a flow path has not been established prior to starting the second pump, both pumps will operate simultaneously on miniflow and potentially cause short-term pump damage. To clarify existing procedural guidance, a proposed change to Procedure 13701-1 "Boric Acid System," Revision 5, has been initiated to enhance administrative controls preventing simultaneous pump operation on miniflow. This administrative control should be implemented by July 31, 1988.

A review of the Unit 1 and 2 CVCS Charging Pumps, Boric Acid Transfer Pumps, and Safety Injection Pumps flow division, taking into consideration the guidelines of NRCB 88-04, is expected to be completed by October 1, 1988. If necessary, corrective actions required to meet the guidelines of NRCB 88-04 will subsequently be accomplished. Previous evaluations conducted with respect to NRC IE Notice 87-59 indicate that probably no modifications to plant operating procedures or hardware will be necessary.

The second potential problem involves the adequacy of miniflow for centrifugal pumps independent of whether or not there is a common recirculation flow path. Traditionally, the required miniflow for these pumps was established solely on the basis of pumped fluid temperature rise. Today, however, it is generally understood that temperature rise is not the only factor influencing safe continuous minimum flow operation. Safety-related centrifugal pumps affected at Plant Vogtle Units 1 and 2 are listed below:

CVCS Charging Pumps:	1-1208-P6-002
	1-1208-P6-003
	2-1208-P6-002
	2-1208-P6-003
Safety Injection Pumps:	1-1204-P6-003
	1-1204-P6-004
	2-1204-P6-003
	2-1204-P6-004

ENCLOSURE (Continued)

INTERIM RESPONSE TO BULLETIN 88-04
POTENTIAL SAFETY-RELATED PUMP LOSS

Boric Acid Transfer Pumps:	1-1208-P6-006 1-1208-P6-007 2-1208-P6-006 2-1208-P6-007
Residual Heat Removal Pumps:	1-1205-P6-001 1-1205-P6-002 2-1205-P6-001 2-1205-P6-002
Turbine Driven Auxiliary Feedwater Pumps:	1-1302-P4-001 2-1302-P4-001
Motor Driven Auxiliary Feedwater Pumps:	1-1302-P4-002 1-1302-P4-003 2-1302-P4-002 2-1302-P4-003
Containment Spray Pumps	1-1206-P6-001 1-1206-P6-002 2-1206-P6-001 2-1206-P6-002

Westinghouse has calculated thermal minimum flow values for the RHR, Centrifugal Charging, Safety Injection and Boric Acid Transfer Pumps. These values were then compared to the nominal minimum flows (NM) developed by each pump. The results showed that in each instance the nominal minimum flow far exceeded the calculated thermal minimum flow (CTM).

<u>PUMP</u>	<u>CTM</u> (gpm)	<u>NM</u> (gpm)
Residual Heat Removal	100	500
Centrifugal Charging	10	60
Safety Injection	7	45
Boric Acid Transfer	1	10

Thermal minimum flow values are normally associated with short-term pump failures, whereas low flow instability is normally associated with long-term pump degradation. Therefore, the above comparison provides justification for continued operation as well as a basis for the conclusion that no short term modifications to plant operating procedures or hardware are deemed necessary at this time.

ENCLOSURE (Continued)

INTERIM RESPONSE TO BULLETIN 88-04
POTENTIAL SAFETY-RELATED PUMP LOSS

Ingersoll-Rand, who supplied all three auxiliary feedwater pumps for each unit, has recently evaluated and reduced the minimum flow requirements for both the turbine driven and motor driven auxiliary feedwater pumps. Thus, the current miniflow specifications are adequate in preventing short-term pump failure due to pumped fluid temperature rise. This is considered adequate justification for continued operation and provides a basis for determining that no short-term modifications to plant operating procedures or hardware are necessary at this time.

The Containment Spray Pumps do not have automatic miniflow capabilities. However, during performance of periodic surveillance testing, the Containment Spray Pumps are operated in a recirculation mode via a permanently installed test line. Due to higher than expected test line resistances, flowrates below pump manufacturer's recommended flowrates were recorded during the Unit 1 preoperational test program. Evaluations by Westinghouse, the pump supplier, have determined that short-term operation (under certain restrictions) during periodic surveillance testing of the Containment Spray Pumps is acceptable and is sufficient justification for continued operation. GPC has initiated a design modification of the test line in order to obtain flowrates sufficient for long-term operation. This design modification is scheduled to be implemented on Unit 1 prior to completion of the first refueling outage and has already been implemented on Unit 2. Since the referenced test line is isolated in the normal system alignment, degradation during emergency conditions should not occur.

GPC will continue to resolve the NRC concern of miniflow adequacy through discussions with the suppliers of safety-related centrifugal pumps used at Plant Vogtle. Long-term evaluations should be completed, and any required modifications to plant operating procedures or hardware should be initiated, by October 1, 1988. The results of the outstanding evaluations and any required corrective actions will be described in a report which is expected to be submitted for NRC review by November 1, 1988.