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October 3, 1988

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

PLANT VOGTLE - UNIT 1
NRC DOCKET 50-424
OPERATING LICENSE NPF-68
REQUEST FOR DISCRETIONARY ENFORCEMENT
REGARDING TECHNICAL SPECIFICATION 3.5.4

Gentlemen:

Georgia Power Company (GPC) in our letter SL-4682 dated May 19, 1988, proposed revisions to Plant Vogtle's Technical Specifications related to shutdown margin requirements. Specifically one change was to increase the range of boron concentration for the refueling water storage tank (RWST) to 2400 ppm to 2600 ppm.

During the transition to the new Technical Specification limit for RWST boron concentration (i.e., Technical Specification 3.5.4) associated with the Positive Moderator Temperature Coefficient employed in Cycle 2, there will be a period of time during which the RWST boron concentration will be between the present upper limit of 2100 ppm and the amended Technical Specification lower limit of 2400 ppm.

It is our intent to raise the boron concentration of the RWST to its new limit by circulating water between the spent fuel pool (current boron concentration of approximately 3200 ppm) and the RWST (current boron concentration of approximately 2000 ppm) by a portion of procedure 13719-1 Rev 6T (Enclosure 1). This will be accomplished by utilizing a gravity feed from the RWST to the spent fuel pool with a return to the RWST via a spent fuel pool cooling pump bypass loop. The end result would be equal boron concentrations in the RWST and the spent fuel pool of approximately 2500 ppm.

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The change in boron concentration in the RWST should occur prior to flooding the refueling cavity to ensure that adequate mixing occurs. Adequate mixing is required to meet the specification of uniformity of boron concentration required by Technical Specification 3.9.1. To delay increasing the RWST boron concentration until Mode 5, the plant condition at which the RWST boron concentration upper limit of 2100 ppm no longer applies, would result in either an unwarranted delay of up to nine days on the outage schedule or a reduced assurance of adequate mixing. In the worst case, the refueling cavity would have a boron concentration on the order of 2100 ppm while the spent fuel pool would have a boron concentration of approximately 3200 ppm.

Additionally, Westinghouse performed a specific evaluation for the change in the boron concentration from 2100 ppm to the proposed lower limit of 2400 ppm. As a result of this evaluation, Georgia Power Company will, prior to boron concentration exceeding 2100 ppm, change EOP-19010, "Loss of Reactor or Secondary Coolant," such that hot leg recirculation switchover will occur at 11 hours. Also, RWST level will be maintained at approximately 36,000 gal above the existing Technical Specification limit during this evolution (approximately 90% of level).

As discussed between representatives of the NRC and GPC in telephone conversations on this date, GPC, therefore, requests the NRC to grant discretionary enforcement of Technical Specification 3.5.4 to allow RWST boron concentration to exceed the current Technical Specification upper limit of 2100 ppm while achieving the proposed lower limit of 2400. The period of time this action would be required would be from October 3, 1988, until the plant is in Mode 5 following shutdown for refueling. Plant shutdown is currently scheduled to begin October 7, 1988.

Enclosure 2 to this letter is a safety evaluation, prepared by Westinghouse Electric Corporation, which documents the technical acceptability of this requested action. The Plant Vogtle Plant Review Board has reviewed this safety evaluation and concurs in its findings.

Should you have questions regarding this request, please contact this office. Your prompt response to this matter is requested.

Sincerely,

for W. G. Hairston, III

WEB:llh

c: (see next page)

Georgia Power



c: <u>Georgia Power Company</u>
Mr. P. D. Rice
Mr. G. Bockhold, Jr.
GO-NORMS

<u>U. S. Nuclear Regulatory Commission</u>
Dr. J. N. Grace, Regional Administrator
Mr. J. B. Hopkins, Licensing Project Manager, NRR (2 copies)
Mr. J. F. Rogge, Senior Resident Inspector - Operations, Vogtle

Enclosure: 1. Excerpt from Procedure 13719-1 Rev 6T
2. Safety Evaluation

Enclosure 1 - Excerpt from Procedure 13719-1 Rev. 6T

4.4.13 Recirculation And Interchange Of Water In The SFP And RWST By Gavity Flow From RWST

CAUTION

During the water interchange operation between the RWST and SFP, the RWST levels shall be maintained within Technical Specification 3.1.2.6 limits.

NOTE

a. This Sub-section transfers water from the RWST to the SFP by continuous gravity flow through 1-12094-U4-066, and from the SFP to the RWST via the SFP filter through 1-1213-U6-049.

b. Spent Fuel Cooling Loop B is to be in service and Loop A shutdown to reduce backpressure on the gravity flow from the RWST.

c. Maximum flow for interchange of water between the SFP and RWST for mixing is desired. The limiting flow is expected to be the gravity letdown path from the RWST to the SFP, between 75 and 100 gpm.

d. The SFP level should be maintained between the HI and LO level alarms.

e. Chemistry should be notified to verify the SFP and RWST water quality satisfactory for transfer, and to monitor during and after transfer for boron concentration.

4.4.13.1 PLACE SFP Cooling Pump B in service per Sub-subsection 4.1.1.

NOTE

If SFP water quality is satisfactory as determined by Chemistry to go to the RWST, the filtration only path should be used. If required by water quality, use the Spent Fuel Pit Demineralizer path.

4.4.13.2 ENSURE Spent Fuel Pit Filter is aligned for service per 11213-1 "Backflushable Filter System Alignment.

4.4.13.3 PLACE the SFP Purification Loop in service from Cooling Loop B for filtration per Sub-subsection 4.1.2 and THROTTLE Spent Fuel Pit Demineralizer Bypass 1-1213-U6-032 to achieve 75 to 100 gpm through the SFP Demineralizer as indicated on 1-FI-0631.

4.4.13.4 MAKEUP to the SFP from the RWST per Sub-subsection 4.2.1.

4.4.13.5 PLACE Sludge Mixing Pump 1-1204-P4-001 in service per 13105-1 "Safety Injection System."

4.4.13.6 OPEN Safety Injection RWST Purification Pump Discharge to RWST Isolation 1-1204-U4-003.

4.4.13.7 OPEN Purification Loop Outlet to RWST 1-1213-U6-049.

4.4.13.8 CLOSE Purification Loop Return to SFP 1-1213-U6-053.

4.4.13.9 OBSERVE the Spent Fuel Pit Filter differential pressure on 1-PDII-41351. If the differential pressure reaches 20 psid, BACKFLUSH the filter per 13213-1 "Backflushable Filter System."

4.4.13.10 OBSERVE the level in the RWST and throttle Spent Fuel Pit Demineralizer Bypass 1-1213-U6-032 to equalize the amount of water to and from the RWST and SFP.

4.4.13.11 When desired mixing results are obtained between the RWST and SFP, RESTORE system to normal as follows:

a. OPEN 1-1213-U6-053,

b. CLOSE 1-1213-U6-049,

c. CLOSE 1-1204-U4-003,

d. CLOSE 1-1204-U4-066,

e. RETURN SFP Purification to desired configuration per Sub-subsection 4.1.2.

f. If desired, SHUT DOWN Sludge Mixing Pump 1-1204-P4-001.

INTRODUCTION

As a result of operational problems encountered at the Alvin W. Vogtle Unit 1 Nuclear Power Plant Westinghouse has been asked to evaluate the impact of continuing recirculation between the Refueling Water Storage Tank (RWST) and the Spent Fuel Pool (SFP). Since the SFP water was at a concentration of 3200 ppm boron, the RWST boron concentration will be raised to a value greater than the current Technical Specification upper limit of 2100 ppm. Should the mixing process between the RWST and the SFP continue indefinitely, the maximum RWST boron concentration that would occur has been calculated to be approximately 2550 ppm. The impact of the increased RWST boron concentration and the continued operation with a recirculation flow of 100 gpm between the RWST and the SFP needs to be determined to support an emergency Technical Specification change to permit Plant Vogtle Unit 1 to operate to the end of Cycle 1 under these conditions.

NON-LOCA EVALUATION

The increase in the RWST boron concentration due to a leakage between the RWST and the SFP has been evaluated for the impact on the Non-LOCA transients. The general conclusion is that an increase in RWST boron concentration over the current initial condition of 2052 ppm will only be beneficial to the Non-LOCA transients. The boron concentration could increase to the assumed 2600 ppm concentration with no adverse impact on the conclusions of the Non-LOCA FSAR transients. This is explained in more detail below.

For the Section 15.1 transients, "Increase in Heat Removal by the Secondary System", there is no adverse effect of an increased RWST concentration on the results or conclusions of the FSAR. The only transients which rely on Safety Injection from the RWST in this Section are the Steam System Piping Failure and the Inadverdent Opening of a Steam Generator Relief or Safety Valve transients. For these two transients an increased boron concentration in the RWST will result in more negative reactivity being injected sooner into the primary system, which would result in a better DNBR (higher) being calculated.

For the Section 15.2 transients, "Decrease in Heat Removal by the Secondary System", there is no adverse effect of an increased RWST concentration on the results or conclusions of the FSAR. These transients do not rely on the Safety Injection system and the borated water from the RWST for reactivity control. As a result there is no significant impact on the results and no impact on the conclusions in the FSAR for these transients.

For the Section 15.3 transients, "Decrease in Reactor Coolant System Flowrate", there is no adverse effect of an increased RWST concentration on the results and conclusions of the FSAR. These transients do not rely on the Safety Injection system and will therefore be unaffected by a change to the RWST boron concentration.

For the Section 15.4 transients, "Reactivity and Power Distribution Anomalies", there is no adverse effect of an increased RWST concentration on the results and conclusions of the FSAR. Except for the Boron Dilution accident these transients do not rely on the Safety Injection system and the borated water from the RWST for reactivity control. As a consequence, the results and conclusions reached for the accidents other than the Boron Dilution event will be unaffected. For the Boron Dilution Events, the increased RWST boron concentration will provide more negative reactivity with which to shutdown the system, and will be a benefit. There are constraints on the Shutdown Margin required as a function of Primary system boron concentration which must continue to be met. The curves for this constraint are found in the Technical Specifications and are explained further as follows.

Boron dilution is most limiting at beginning of life when critical boron concentrations are very high and increased shutdown margin is required in the shutdown modes to provide adequate operator action time. At the end of life the transient is much less limiting due to very low critical boron concentrations. In the event that the RCS boron concentration increases above the current RWST limit of 2100 ppm, more shutdown margin via boron will be provided and this will contribute to the amount of time available for operator action. To operate with RCS boron concentrations greater than maximum values for the abscissa (2100 ppm) reported in the current Technical Specifications (Figure 3.1-1 and 3.1-2) for the shutdown margin curves, maintain the shutdown margin at the value related to 2100 ppm. This will provide adequate time for operator action to isolate any dilution source before the return to criticality.

For the Section 15.5 transients, "Increase in Reactor Coolant Inventory", there is no significant adverse effect of an increase RWST concentration on the results and conclusions of the FSAR. For the Spurious Safety Injection transient, due to the higher RWST boron concentration, a greater power mismatch will occur early in the transient. However, this transient is easily controlled by the existing protection systems and it is judged that the DNBR would still be well above the limit value as it is in the case reported for minimum feedback in the FSAR. DNBR is the major criterion of concern for this transient and the DNBR continually increases for the minimum feedback transient presented.

For the Section 15.6 transients, "Decrease in Reactor Coolant Inventory", there is no adverse effect of an increased RWST concentration on the results and conclusions of the FSAR for the Non-LOCA transients. These transients do not rely on the Safety Injection system for reactivity control and will therefore be unaffected by a change to the RWST boron concentration.

For the Mass and Energy release calculations for the Steam Line break transients, there is no adverse effect of an increased RWST concentration on the results and conclusions of the FSAR. An increased boron concentration in the RWST will be of benefit to these transients since the increased boron will serve to offset the increase in reactivity due to the cooldown. This would result in less energy being available on the primary side to be transferred out the break.

In summary, the Non-LOCA transients have been reviewed to assess the impact of an increase in the RWST boron concentration above the current limit value of 2100 ppm. It is concluded that an increase in RWST concentration to as high as 2600 ppm will have no significant adverse impact on the results of the FSAR, and the conclusions of the FSAR remain valid.

LOCA EVALUATION

The evaluation that has been performed for the implementation of the PMTC and for an increased RWST boron concentration of 2600ppm (Reference 1) is applicable at this time for the following LOCA related accidents:

1. Large Break LOCA
2. Small Break LOCA
3. LOCA Hydraulic Forcing Functions
4. Post-LOCA Long Term Cooling
5. Rod Ejection Mass Releases
6. Hotleg Switchover to Prevent Boron Precipitation

The conclusions outlined in Reference 1 are applicable and valid and envelope the increased boron concentration conditions experienced at this time. It should be noted however, that as a result of the increased RWST boron concentration a change to the hotleg switchover time to 11 hours should be made to the applicable operating procedures.

CONTAINMENT INTEGRITY LOCA MASS AND ENERGY ANALYSIS

The containment integrity LOCA mass and energy analyses do not take credit for the soluble boron present in the RWST via safety injection supplied to the RCS. The minimum boron concentration allowed by the technical specifications is modeled in the mass and energy release analysis for postulated secondary system pipe ruptures inside containment. An increase in the boron concentration will insert more negative reactivity into the core and result in less limiting mass and energy releases and therfore will lessen the consequences of adverse containment conditions.

STEAM GENERATOR TUBE RUPTURE ACCIDENT

An evalutaion on the SGTR accident has been performed and it is determined that the low pressurizer pressure SI signal is actuated due to the decrease in the RCS inventory shortly after reactor trip and borated water from the RWST in delivered to the RCS. For the SGTR anlysis, the primary to secondary break flow was assumed to be terminated at 30 minutes after the initiation of the event. However, the operator actions required to terminate the break flow, including the initial RCS cooldown were not modeled in the analysis. Although the RCS cooldown is not modeled, suffiecient shutdown margin is assumed to be available initially due to the insertion of the control rods following a reactor trip, and adequate shutdown margin is assumed to be maintained for the long term by borated safety injection. Since the minimum boron concentration is modeled in the SGTR accident to simulate reactivity insertion the higher RWST boron concentration will have no adverse effect on the FSAR SGTR accident.

RWST VOLUME REQUIRED

As stated in Reference 1, raising the RWST boron concentration increases the conservatism of the volumes presently specified as being required in the RWST.

With the line from the RWST to the spent fuel pool open and resulting in a continuing draindown of about 100 gpm, operability of the RWST is a concern.

If a large break loss of coolant accident were to occur as this process is continuing, the volume of RWST water that woule be delivered to the containment sump would be reduced by approximately 3000 gallons. This volume of water is considered insignificant when compared to the total volume of RWST water available. In terms of the volume of water lost and therefore unavailable for injection, the small break LOCA is considered to be more limiting because of the longer injection time during which the RWST is drawn down.

If a small break LOCA were to occur as this process is continuing, the emergency response guidelines E1/E2 indicate that the injection phase would only last 185 minutes before all the high head safety injection pumps are off except for one charging pump operating in the normal charging mode. The RWST level would not reach the low low level switchover setpoint and the small LOCA would be terminated before recirculation is required. The presence of an additional 100 gpm outflow from the RWST during this injection period does not change these conclusions.

If the small break LOCA were to endure for a longer period of time, then recirculation from the containment sump would be required after approximately 6 hours. Due to the 100 gpm outflow from the RWST over this period of time, there would be approximately 36,000 gallons of injection water lost to the spent fuel pit which would not be available on the containment floor for recirculation. However, the containment sump would still be flooded above the required elevation of 170.6 feet so that there would be no impact on ECCS recirculation. (Note Georgia Power should verify that this is a true statement; alternatively, a commitment can be made to maintain the RWST level at 36,000 gallons above present Technical Specification minimum limit if this is possible).

REACTOR MAKEUP CONTROL SYSTEM

Although the RWST will be operating with an increased boron concentration, there will be no impact on the reactor makeup control system since there is no need to supply borated water at a concentration to match the increased RWST concentration.

MINIMUM POST LOCA SUMP SOLUTION pH

As discussed in Reference 1, operation of the Vogtle Station with 2600 ppm boron in the RWST will result in a reduction in the minimum post accident sump solution pH from 8.5 to 8.15. Since the equilibrium RWST boron concentration (after mixing with the spent fuel pool) is less than 2600 ppm boron, the evaluations provided in Reference 1 for areas impacted by reduction in the sump solution pH remain bounding for this case. These areas include:

Hydrogen Generation Due to Corrosion of Aluminum and Zinc

Equipment Qualification

Chloride Induced Stress Corrosion of Stainless Steel

LOCA Thyroid Doses

Reference 1 concluded that with the proposed operation with an RWST boron concentration as high as 2600 ppm boron there was no significant impact on safety associated with the above concerns.

Maximum POST LOCA SUMP SOLUTION pH

The maximum sump solution pH remains less than the present licensing basis of 10.5 since the increase in RWST boron concentration would decrease the sump pH.

INJECTION SPRAY pH

As discussed in Reference 1, the pH of the containment spray flow during the injection phase is conservatively estimated to be less than 10.5 and greater than 8.5 and is thus within the present licensing basis.

## CONCLUSIONS

In summary, a review of the LOCA, Non-LOCA, and fluid system related transients was performed to evaluate the effects of the increased RWST boron concentration. It has been determined that the conclusions of the FSAR or conclusions discussed in Reference 1 remain valid and that the presence of an increased RWST boron concentration up to 2600 ppm do not involve an unreviewed safety question.

## REFERENCES

1. Positive Moderator Temperature Coefficient and RWST/Accumulator Boron Concentration Increase Licensing Report for Vogtle Electric Generating Plant Units 1 and 2, April 1988.