Georgia Power Company
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201
Telephone 205 877-7122

C. K. McCoy
Vice President, Nuclear
Vogtle Project

Georgia Power
the southern electric system

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Docket Nos. 50-424 ELV-03830
50-425

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M82725

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

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION POWER UPRATING

By letter ELV-03375 dated February 28, 1992, Georgia power Company proposed amendments to the operating licenses for the Vogtle Electric Generating Plant Units 1 and 2 that revise the definition of rated thermal power. By letter dated June 2, 1992 the NRC requested additional information in the form of four questions that were attached to the letter. Attached to this letter are the responses to the NRC's questions.

Sincerely,

C. K. McCoy

CKM/HWM/ehd
Attachment
xc: Georgia Power Company
Mr. W. B. Shipman
Mr. M. Sheibani
NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
Mr. D. S. Hood, Licensing Project Manager, NRR
Mr. B. R. Bonser, Senior Resident Inspector, Vogtle

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ATTACHMENT

Question

1. The second paragraph on page E1-1 states that a new calculation of the Z value and the OTDT reset function has been conducted by Westinghouse since your letter ELV-02166 was submitted. Since these calculations directly affect the Technical Specification changes requested and have not been previously submitted, they should be submitted to the NRC for our review. In this regard, the documentation of these calculations should be sufficiently comprehensive that either they can be independently audited as they are presented OR they reference topical reports that have been previously reviewed and APPROVED by the NRC.

Response

1. The overtemperature delta-T (OTDT), F-delta-I reset function was revised in order to support operation at the uprated power level. This revision to the reset function changed the slope of the positive wing of the function in order to provide a penalty that is sufficiently large enough to account for adverse axial power shapes that have a large positive delta-I value. This revision to the reset function was not required for operation at the lower power level; therefore, it was not part of the Technical Specification changes that were submitted with letter ELV-02166.

   The methodology for calculating Z is described in WCAP-11269, Rev. 1, "Westinghouse Setpoint Methodology of Protection Systems - Vogtle Station," which was previously submitted to the NRC during the initial licensing of Vogtle (Georgia Power Company letter GN-1276, Bailey to Youngblood, December 31, 1986).

   Line 7 in the table on page 4-13 of WCAP-11269 shows how Z is determined for the OTDT protection channel. Z is related to the Process Measurement Accuracy (PMA) for delta-I which is defined on page 3-26 of WCAP-11269 (PMA1 and PMA2). As can be seen in the calculation of PMA1 and PMA2, a value of 0.83 was originally used for the slope of the positive wing of the F-delta-I reset function. This value was changed to 1.97 as part of the Technical Specification changes for the Vantage-5 fuel design as submitted in letter ELV-02166. At the same time, the Total Allowance (TA) was also changed from 6.6 to 10.7 as a result of the analyses to support the Vantage-5 fuel design. In order to support operation at the uprated power level, only the slope of the positive wing of the F-delta-I reset function must be changed; increasing the slope from 1.97 to 2.7 results in changes in PMA1 and PMA2. This in turn results in an increase in Z from 7.04 to 8.8. These changes were submitted with letter ELV-03375.

   The change to the reset function does not affect the values of TA and the trip setpoint used in the analyses, and therefore, the analyses presented in ELV-02166 remain valid.

Question

2. Enclosure 3 Table 2.2-1 states that the nominal average operating temperature will be less than or equal to 588.4. Enclosure 5 Table 2.1-1 states that the vessel average temperature under the proposed reduced operating temperature will be 570.7. Please clarify this discrepancy.

Response

2. The criteria in Technical Specification Table 2.2-1 allows a T-avg of less than or equal to 588.4 deg-F, which defines the upper bound of T-avg for which VEGP has been analyzed. This T-avg is also identified in our Table 2.1-1 of Enclosure 5 to letter ELV-03375 (dated February 28, 1992) under the nominal temperature heading for vessel average. The lower bound reduced T-avg of 570.7 deg-F, for which VEGP has been analyzed, is also defined in Enclosure 5 on Table 2.1-1 under the reduced temperature heading for vessel average. Therefore, the operating window of T-avg for which VEGP has been analyzed is within the range of 588.4 deg-F to 570.7 deg-F. Any temperature within this range can be selected as the reference T-avg for a particular operating cycle. This range is consistent with the Technical Specification criteria of less than or equal to 588.4 deg-F. The terms "T-avg" and "vessel average" are synonymous.

Question

3. Enclosure 5 page 3-4 states that the "evaluation assumes that the reference average temperatures used in the OTDT and OPDT setpoint equations are rescaled in accordance with the Technical Specifications to be consistent with the T-hot reduction nominal average temperature." Using the material to be supplied in response to question 1 above and the clarification to be provided in response to question 2 above, identify the Technical Specification that specifies how the rescaling is to be conducted and provide an example calculation.

Response

3. The Technical Specification which specifies rescaling is Table 2.2-1 NOTE 1 for the overtemperature delta-T equation and NOTE 3 for the overpower delta-T equation. Both these equations define the reference T-avg (T' in the overtemperature delta-T equation and T" in the overpower delta-T equation) to be set at a value less than or equal to 588.4 deg-F. Consistent with the response to Question 2 above, any T-avg within the range of 588.4 deg-F to 570.7 deg-F can be selected for the reference T-avg for a particular operating cycle. In order to comply with the assumptions of the safety analyses, the values of T' and T" must be adjusted accordingly, as specified in the respective equations in Technical Specification Table 2.2-1. Rescaling of the reference T-avg is not affected by the overtemperature delta T reset function issue discussed in Question 1 above and does not require any calculations. Rescaling the reference T-avg only requires resetting the control setpoint. Table 2.2-1 requires that the value of T' and T" be set consistent with the reference T-avg.

Question

4. Enclosure 6 contains contradictory statements with regard to the ability to achieve the desired power uprate at the desired temperature reduction. Please clarify the discrepancies between the statement in the third paragraph of page S1 ("the full extent of a reactor coolant temperature reduction of 10 to 15 degrees is not achievable without hardware modifications") and the third paragraph on page 1 ("a power uprate from the currently licensed reactor core power level of 3411 MWt to a licensed reactor core power level of 3565 MWt is achievable which will net an additional 50 MWe per unit, without physical modifications to the plant").

Response

4. The following is a clarification of the statements made on pages S1 and 1 of Enclosure 6 to letter ELV-03375, dated February 28, 1992, regarding the ability of the plant to achieve the desired power uprate.

   A T Hot reduction of approximately 7° F (as referred to on page S1 of Enclosure 6 to letter ELV-03375) corresponds to estimated steam generator outlet conditions (secondary side), at the uprated licensed reactor core power level of 3565 MWt, which would result in the desired power level increase of 50-MWe additional power output for each of the Vogtle units. This additional MWe power output is expected to be achievable without any physical modification to the NSSS or BOP systems as indicated on page 1 of Enclosure 6. However, a T Hot reduction greater than 7° F would not yield the desired MWe power increase since the existing turbine steam flow rate capacity, without physical modification, would likely be limiting for the steam generator outlet conditions (secondary side) corresponding to a T Hot reduction greater than 7° F.

   Operating the plant at an uprated reactor core power level of 3565 MWt with a T Hot reduction greater than 7° F would not affect safety related system design or safe operation. However, operating the plant under these conditions is not expected to be achievable without physical plant modifications to nonsafety related BOP systems due to the steam flow rate limitations of the existing turbine.