



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 37 TO FACILITY OPERATING LICENSE NPF-12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

I. INTRODUCTION

By letter dated June 19, 1984 (Reference 1), South Carolina Electric and Gas Company (SCE&G) requested an amendment to the V. C. Summer Technical Specifications. The amendment would change the reactor coolant system flow measurement uncertainty from 3.5% to 2% in Technical Specification 3.2.3, "RCS Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor" and in its bases. The amendment would also add a third region (Region III) of acceptable operation to Technical Specification Figure 3.2.3 "RCS Flow Rate versus R." This region would allow plant operation with a 2% reduction in power for every 1% reduction in flow from 100% to 95% total flow.

By letter dated November 29, 1984 (Ref. 2), SCE&G requested that their initial submittal be revised to eliminate the request for a reduced measurement uncertainty of 2% and then revise the Region III of acceptable operation to reflect a 3.5% reactor coolant system (RCS) flow measurement uncertainty instead of the 2% measurement uncertainty.

The initial amendment request was noticed in the Federal Register (49 FR 42830) on October 24, 1984. The revised amendment request effectively only eliminated the request for a revised RCS flow measurement uncertainty, which necessitated changing some Region III values. Because these changes were small and the basic amendment request, as noticed, of reducing power by 2% for every 1% reduction in flow from 100% to 95% total flow was not changed, this amendment request was not renoticed.

II. EVALUATION

The licensee presented information (Ref. 2) to justify operation at up to 10% reduced Rated Thermal Power (RTP) if measured RCS flow is found to be less than the Thermal Design (TD) flow. This is instead of the requirement of the current Technical Specification 3.2.3, Figure 3.2-3 which limits operation to less than 5% of RTP if the measured RCS flow is less than the TD flow used in the plant safety analyses. The licensee presented information on relationships between core power, flow and departure from nucleate boiling (DNB) which resulted in a relationship between power and flow of 0.555. However, instead they proposed a conservative value of 2.0. For comparison, a staff independent calculation was made using sensitivity factors from a Battelle Pacific Northwest Laboratories Study (Reference 3). The value obtained was 0.833 instead of 0.555. However, the licensee's proposed value of 2.0 for the power to flow relationship remains conservative to

either calculation. Based on this value of 2.0, the licensee requested that a new region of acceptable operation be added to Figure 3.2-3 in the Technical Specifications for:

$$95\% \text{ TD flow} \leq \text{RCS flow} \leq 100\% \text{ TD flow.}$$

The licensee has modified Figure 3.2-3 such that the maximum power level for the new region is reduced by 2% for each 1% reduction in measured flow below TD flow in steps of 2% power up to a maximum of 10% reduction in rated power at 95% TD flow. The Technical Specification accident analysis results have been evaluated by the licensee to determine the impact of operating within the defined new region (Region III) of Figure 3.2-3 with the imposed restriction. It was found that sufficient margin exists in all cases to allow continued plant operation; no Technical Specification limits require modifications, including core limits, overtemperature delta T, overpower delta T, and Power Range Neutron Flux High Setpoints. This analysis took account of the increased margin to DNB because of power reduction. The licensee will restrict the power level to 100% Rated Thermal Power (RTP) for Figure 2.1-1, "Reactor Core Safety Limit - Three Loops in Operation" when operating in the defined new region (Region III) of Figure 3.2-3 at the 95% to 100% reduced TD flow conditions. The staff has found these changes to be acceptable.

In conclusion, we have reviewed the analysis performed by the licensee to justify the proposed Technical Specification changes for operation of the V. C. Summer plant at the proposed 2 to 1 power/flow tradeoff for operation between 95% TD to 100% TD flow. The review included sensitivity studies on the impact of flow reduction on DNB thermal margin and DNB ratio limiting transients. The sensitivity analysis was found to be acceptable. We have found that the proposed Technical Specification changes properly account for the power/flow tradeoff and are, therefore, acceptable.

III. ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the use of a facility component located within the restricted area as defined in 10 CFR part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 51.22 (c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

IV. CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (49 FR 42830) on October 24, 1984, and consulted with the state of South Carolina. No public comments were received, and the state of South Carolina did not have any comments.

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

REFERENCES

1. Letter from O. W. Dixon, Jr., South Carolina Electric and Gas Company, to H. R. Denton, (NRC), dated June 19, 1984.
2. Letter from O. W. Dixon, Jr., South Carolina Electric and Gas Company, to H. R. Denton, (NRC), dated November 29, 1984.
3. G. M. Hesson and J. M. Cuta, "Analysis of the Sensitivity of Calculated MDNBR to Eight Selected DNB Parameters", FATE-70-101, Battelle Pacific Northwest Laboratories, March 1979.

Principal Contributor: Jon B. Hopkins, Licensing Branch No. 4, DL
Harry Balukjian, Core Performance Branch, DSI

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AMENDMENT NO. 37 TO FACILITY OPERATING LICENSE NO. NPF-12 - Virgil C. Summer Unit 1

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