July 21, 2004

Mr. Stephen A. Byrne
Senior Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88
Jenkinsville, South Carolina 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT RE: REACTIVITY CONTROL SYSTEMS - MODERATOR TEMPERATURE COEFFICIENT (TAC NO. MC0239)

Dear Mr. Byrne:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 169 to Renewed Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit No. 1. The amendment changes the Technical Specifications in response to your application dated July 23, 2003.

This amendment revises the near-end of life Moderator Temperature Coefficient (MTC) Surveillance Requirement 4.1.1.3.b by placing a set of conditions on core operation, which, if met, allow exemption from the required MTC measurement. The conditional exemption is determined on a cycle-specific basis by considering the margin predicted to the surveillance requirement MTC limit and the performance of other core parameters, such as beginning of life MTC measurements and the critical boron concentration as a function of cycle length.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* notice.

Sincerely,

/RA/

Karen R. Cotton, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosures:
1. Amendment No. 169 to NPF-12
2. Safety Evaluation

cc w/enclosures: See next page

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cc:

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SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

DOCKET NO. 50-395

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 169
Renewed License No. NPF-12

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by South Carolina Electric & Gas Company (the licensee), dated July 23, 2003, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-12 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 169, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. South Carolina Electric & Gas Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Stephanie Coffin, Acting Section Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: July 21, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 169

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-12

DOCKET NO. 50-395

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages	Insert Pages
3/4 1-5	3/4 1-5
6-16a	6-16a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 169 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By application to the U.S. Nuclear Regulatory Commission (NRC) dated July 23, 2004, South Carolina Electric & Gas Company (SCE&G, the licensee) requested changes to the Technical Specifications (TSs) for the Virgil C. Summer Nuclear Station (VCSNS). The proposed changes would revise the near-end of life (EOL) Moderator Temperature Coefficient (MTC) Surveillance Requirement (SR) 4.1.1.3.b by placing a set of conditions on core operation, which, if met, allow exemption from the required MTC measurement.

2.0 REGULATORY EVALUATION

The requested amendment entails a change to TS 4.1.1.3, "Moderator Temperature Coefficient." This TS specifies SRs stipulated by Title 10, *Code of Federal Regulations* (10 CFR) Section 50.36(c)(3), "Surveillance Requirements," to demonstrate that the MTC is within the limits assumed in the VCSNS Final Safety Analysis Report accident and transient analyses. In particular, the change addresses the EOL negative MTC SR.

Under TS 4.1.1.3, the licensee must perform a MTC measurement near EOL, and compare the measured value to the TS SR value for the full-power, all rods out condition. The licensee must perform this measurement 7 effective full-power days after reaching the equivalent of an equilibrium rated thermal power, with all rods out and a boron concentration of 300 ppm. Each measurement requires several hours, or more, at less than full-power operation and, thereby, contributes to an economic loss with regard to power generation.

The more than 2 decades of end-of-cycle MTC measurements made at pressurized-water reactors for compliance with TS 4.1.1.3 form a significant data base for validating calculational methodologies for predicting EOL MTC. To this end, in a letter dated June 1, 1993, Westinghouse submitted to the NRC, Topical Report WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement." In WCAP-13749-P-A, Westinghouse proposed to eliminate the SR for the EOL MTC if a specified revised prediction of the MTC and limits for several core

parameters measured during the cycle are within specified bounds. WCAP-13749-P-A presents a prescription for revising the MTC TS and the Core Operating Limits Report (COLR) to provide for possible cycle-specific elimination of the EOL SR.

In a letter dated October 9, 1996, the NRC staff stated that they reviewed and approved WCAP-13749-P-A for referencing in licensing applications to the extent specified and under limitations stated in the Technical Evaluation Report performed by Brookhaven National Laboratory and the NRC's Safety Evaluation Report.

3.0 TECHNICAL EVALUATION

The three main components which contribute to a MTC prediction different from the measured MTC of the core are the following: (1) the global core reactivity as indicated by the soluble boron letdown curve, (2) variations in the core average axial offset, and (3) the MTC predictive capability of the design model. WCAP-13749-P-A addressees these three components and specifies an algorithm that computes a revised predicted MTC based on the actual core reactivity and the axial power distribution. Benchmark analyses demonstrate that the core model, based on the PHOENIX/ANC design system, accurately predicts the depletion characteristics of the operating core and indicates whether sufficient margin exists to the SRs limit for the operating conditions of the core. The validated computational algorithm forms the basis of the proposed conditional exemption from the hot full-power near-EOL 300 ppm MTC measurement at VCSNS. The safety analysis assumption of a constant moderator density coefficient and the actual value assumed will not change. The TS Bases for, and values of, the most negative MTC limiting condition for operation and for the SRs are not altered. Rather, a revised prediction is compared to the surveillance MTC to determine if the limit is met. The method for calculating the revised predicted MTC is the approved methodology of WCAP-13749-P-A, and, thereby, is acceptable to the NRC staff. This acceptance is subject to the following limitations: (1) only PHOENIX/ANC calculation methods are used for the individual plant analyses relevant to determinations for the EOL MTC plant methodology, and (2) the predictive correction is reexamined if changes in core fuel designs or continued MTC calculation/measurement data show significant effect on the predictive correction.

SCE&G proposes to reduce the unnecessary regulatory burden for both the NRC and the licensee by including the applicability restrictions in WCAP-13749-P-A, the algorithm and the acceptance criteria of the Report, "Most Negative Moderator Temperature Coefficient Limit Report" (the Report) in the station procedure governing the EOL MTC surveillance, in lieu of submitting to the NRC the Report, as prescribed by WCAP-13749-P-A. The staff concurs with SCE&G that there is an inconsistency in WCAP-13749-P-A with regard to the timeframe of data collection and the submittal of the Report to the NRC. The staff also concurs that the Report serves no technical or business need. The required actions, when the limiting conditions of operation are not met, are given in the TSs. The proposal to include the applicability restrictions in WCAP-13749-P-A, the algorithm and the acceptance criteria of the Report in the station procedure governing the EOL MTC surveillance is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of South Carolina official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes SRs. The NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (68 FR 56346). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 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 the amendment.

6.0 CONCLUSION

The NRC staff has reviewed the licensee's proposed TS change that will accomplish the following: (1) revise SR 4.1.1.3.b so as to suspend the MTC measurement if the model benchmark criteria and Revised Prediction specified in the COLR are satisfied, and (2) WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," is added to the list of references for the COLR in TS 6.9.1.11. The NRC staff finds that this TS change complies with the conditions set forth in General Design Criterion 11 and the associated requirements of 10 CFR 50.36(c)(3), and is, therefore, acceptable.

Furthermore, the NRC staff finds acceptable the inclusion of the applicability restriction in WCAP-13749-P-A, the algorithm and the acceptance criteria of the Report in the station procedure governing the EOL MTC surveillance, in lieu of submitting the Report to NRC as specified in WCAP-13749-P-A. This enhancement is consistent with NRC objective of reducing the licensee's unnecessary regulatory burden and will enhance clarity with regard to procedural actions.

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Yuri Orechwa

Date: July 21, 2004