

January 24, 2002

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: DECREASE OF HOT CHANNEL FACTOR EXCLUSION
ZONE AT TOP AND BOTTOM OF CORE (TAC NO. MB2052)

Dear Mr. Byrne:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 153 to 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 May 24, 2001.

This amendment revises Technical Specifications (TS) Sections 4.2.2.2.e and g, and 4.2.2.4.e and g to adopt a modified methodology that relocates the heat flux hot channel factor, $F_Q(z)$, penalty for increasing $F_Q(z)$ versus burnup to a table in the Core Operating Limits Report. The amendment also increases the surveillance region of $F_Q(z)$ to be consistent with the current core design and to provide assurance that the peak $F_Q(z)$ is monitored and evaluated near the end of core life.

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's Bi-weekly Federal Register notice. This completes the staff's efforts on TAC No. MB2052.

Sincerely,

/RA/

Ramin Assa, 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. 153 to NPF-12
2. Safety Evaluation

cc w/encls: See next page

FILENAME - G:\PDII-1\SUMMER\MB2052-AMD.WPD

*See previous concurrence

OFFICE	PM:PDII/S1	LA:PDII/S2	SC(A):PDII/S1	OGC*	TS**
NAME	RAssa	EDunnington	RLaufer	MO'Neill	AAttard
DATE	1/18/02	1/18/02	1 /18/02	01/16/02	10/3/01
COPY	Yes/No	Yes/No	Yes/No	Yes/No	

OFFICIAL RECORD COPY

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

DOCKET NO. 50-395

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153

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 May 24, 2001, 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 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. 153 , 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/

Richard J. Laufer, Acting 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: January 24, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 153

TO 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

3/4 2-6
3/4 2-6a
3/4 2-6c
B 3/4 2-4
B 3/4 2-5

Insert Pages

3/4 2-6
3/4 2-6a
3/4 2-6c
B 3/4 2-4
B 3/4 2-5

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 153 TO 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 dated May 24, 2001, South Carolina Electric & Gas Company (SCE&G, the licensee) requested changes to the Technical Specifications (TS) for the Virgil C. Summer Nuclear Station (VCSNS), Unit No. 1. The proposed changes revise TS Sections 4.2.2.2.e and g, and 4.2.2.4.e and g to adopt a revised methodology that relocates the heat flux hot channel factor, $F_Q(z)$, penalty for increasing $F_Q(z)$ versus burnup to a table in the Core Operating Limits Report (COLR). SCE&G also proposed to increase the surveillance region of $F_Q(z)$ to be consistent with the current core design and to provide assurance that the peak $F_Q(z)$ is monitored and evaluated near the end of core life.

2.0 BACKGROUND

The hot channel factor surveillance TS methodology is discussed in the Westinghouse topical report WCAP-10216-P-A, "Relaxation of Constant Axial Offset Control $F_Q(z)$ Surveillance Technical Specification," Revision 1A. This topical report is referenced in TS Section 6.9.1.11 and is used to determine the core operating limits.

The $F_Q(z)$ TS takes into account the possibility that $F_Q(z)$ may increase between surveillances. The TS requires that when performing the surveillance, the resulting maximum $F_Q(z)$ value must be compared to the maximum $F_Q(z)$ determined from the previous measurement. If the maximum $F_Q(z)$ has increased since the previous determination, the TS allows two options: either the current $F_Q(z)$ must be increased by an additional 2.0 percent to account for further increases in $F_Q(z)$ before the next surveillance, or the surveillance period must be reduced to every 7 effective full-power days (EFPD). Currently, the penalty is applied via a combination of 2 percent, which is located in the TS, and the $W(z)$ functions, which are located in the COLR. $W(z)$ is a cycle-specific dependent function that accounts for power distribution transients encountered during normal operations. The proposed method (which is the implementation of WCAP-10216-P-A) by VCSNS will move the cycle-specific penalty out of the TS and place it in the COLR.

In addition, recent cycles (specifically, cycles 11 and 12) indicated that measured $F_Q(z)$ were very close to their limiting values when measured near or within the 15-percent exclusion zones at the top and bottom of the core. The licensee pointed out that for cycles 11 and 12, the near end of life (EOL) maximum measured $F_Q(z)$ occurred just inside the exclusion region near the boundary of the exclusion region of the core. The licensee also pointed out that core design calculations for the upcoming cycle 13 indicate $F_Q(z)$ behavior is similar to that of the past two cycles.

3.0 EVALUATION

By definition, the hot channel factor $F_Q(z)$ is the maximum local heat flux on the surface of the fuel rod at any height z , divided by the average fuel rod heat flux. This value is defined and measured to assure that the design limits on peak local power density are maintained, and that in the event of a loss-of-coolant accident, the peak fuel clad temperature will not exceed acceptance criteria. Typically, $F_Q(z)$ surveillance is required only when the power has been exceeded (increased) by 10 percent of rated power since the previous surveillance, or at least every 31 EFPD. In addition, the TS for VCSNS takes into account the possibility that $F_Q(z)$ may increase between surveillances, at which point TS directives will allow two lines of action: increase the current $F_Q(z)$ by an appropriate burn-up dependent penalty to account for further increases in $F_Q(z)$ before the next surveillance, or the surveillance period must be reduced to every 7 EFPD.

Currently, the penalty is applied via a combination of 2 percent, which is located in the TS, and the $W(z)$ functions, which are located in the COLR. The $W(z)$ values typically include any excess penalty (if needed) above 2 percent. Based on the Westinghouse Relaxed Axial Offset Constant methodology (WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control $F_Q(z)$ Surveillance Technical Specification"), which was approved by the NRC in 1994, the 2-percent burn-up dependent penalty factors can be relocated from the TS to the COLR. The cycle-specific burn-up dependent penalty factors will have a minimum value of 2 percent, and the $W(z)$ functions will no longer include any excess penalty. This change is consistent with the NRC-approved Westinghouse methodology, and is therefore acceptable to the staff.

Included in the methodology described in WCAP-10216-P-A, Revision 1A, is the notification that when verifying $F_Q(z)$ is within limits, the top and bottom 15 percent of the core (0-15 percent and 85-100 percent of the core height) are excluded from consideration. Recent, core designs performed specifically for VCSNS include 6-inch non-fully enriched axial blankets, long cycle lengths at increased power, and a small number of feed assemblies. Toward EOL, these core designs tend to cause the axial power distribution to be pushed toward the top and bottom ends of the core. Currently, the top and bottom 15 percent of the core are excluded from consideration of $F_Q(z)$ surveillance because of the difficulty in obtaining precise measurements in the specified regions, and because the probability that these regions would be more limiting than the central 70 percent of the core is very low. However, the licensee pointed out that in recent cycles (cycles 11 and 12), the near EOL maximum measured $F_Q(z)$ occurred just inside these exclusion regions. The upcoming cycle 13 is very similar in design to the previous cycles; as a result, the licensee expects similar behavior of the $F_Q(z)$ near or within the excluded regions. Consequently, the licensee is proposing that the excluded zones be reduced to 10 percent, thus allowing monitoring of $F_Q(z)$ within the current 15 percent of the excluded regions.

This is a more conservative approach than the current TS requirement, and imposes no safety significance to the TS limit. The staff agrees with this request.

The staff has reviewed the licensee's proposed TS changes for VCSNS. Based on the staff's evaluation of the proposed TS changes and the implementation requirements for measuring $F_Q(z)$ outside the exclusion zones of the top and bottom 10 percent of the core, the staff approves the proposed request to move the cycle-specific burn-up dependent penalty factor to the COLR at VCSNS.

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 surveillance requirements. 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 (66 FR 38766). 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 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: A. C. Attard

Date: January 24, 2002

Mr. Stephen A. Byrne
South Carolina Electric & Gas Company

VIRGIL C. SUMMER NUCLEAR STATION

cc:

Mr. R. J. White
Nuclear Coordinator
S.C. Public Service Authority
c/o Virgil C. Summer Nuclear Station
Post Office Box 88, Mail Code 802
Jenkinsville, South Carolina 29065

Ms. Kathryn M. Sutton, Esquire
Winston & Strawn Law Firm
1400 L Street, NW
Washington, DC 20005-3502

Resident Inspector/Summer NPS
c/o U.S. Nuclear Regulatory Commission
576 Stairway Road
Jenkinsville, South Carolina 29065

Chairman, Fairfield County Council
Drawer 60
Winnsboro, South Carolina 29180

Mr. Henry Porter, Assistant Director
Division of Waste Management
Bureau of Land & Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Gregory H. Halnon, General Manager
Nuclear Plant Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Mail Code 303
Post Office Box 88
Jenkinsville, South Carolina 29065

Mr. Melvin N. Browne, Manager
Nuclear Licensing & Operating Experience
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Mail Code 830
Post Office Box 88
Jenkinsville, South Carolina 29065