

April 14, 1987

Docket No. 50-395

Mr. D. A. Nauman  
Vice President, Nuclear Operations  
South Carolina Electric & Gas Company  
P.O. Box 764 (Mail Code 167)  
Columbia, South Carolina 29218

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CMiles	LTremper

Dear Mr. Nauman:

The Commission has issued the enclosed Amendment No. 65 to Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application dated January 8, 1987.

The amendment changes the units for the intermediate range nuclear instrumentation from current (AMPS) to the equivalent percent indication. This amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

A copy of the related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,



Jon B. Hopkins, Project Manager  
Project Directorate II-1  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 65 to NPF-12
2. Safety Evaluation

cc w/enclosures:

See next page

\*SEE PREVIOUS CONCURRENCE

LA:PAD2	PM:PAD2	PD:PAD2	OGC
*DMiller	*JHopkins:bg	*LRubenstein	*
3/12/87	3/12/87	3/12/87	3/18/87

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PDR

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*ISI*

Jon B. Hopkins, Project Manager  
~~PWR~~ Project Directorate # ~~2~~ II - 1  
Division of ~~PWR~~ Licensing - A  
Office of Nuclear Reactor Regulation

*Reactor Projects - I/II*

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- 2. Safety Evaluation

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See next page

LA: PAD2  
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3/12/87

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JHopkins: bg  
3/12/87

*BLB*  
PD: PAD2  
LRubenstein  
3/12/87

OGC  
*[Signature]*  
3/12/87

Mr. D. A. Nauman  
South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station

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

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. 65  
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 and South Carolina Public Service Authority (the licensees) dated January 8, 1987, 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:

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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 65, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

*Elinor G. Adensam*

Elinor G. Adensam, Director  
Project Directorate II-1  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: April 14, 1987

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 65 TO FACILITY OPERATING LICENSE NO. NPF-12

DOCKET NO. 50-395

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change. Corresponding overleaf pages are also provided to maintain document completeness.

Remove Pages

2-7

B2-5

Insert Pages

2-2

B2-5

TABLE 2.2-1 (continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>Functional Unit</u>	<u>Total Allowance (TA)</u>	<u>Z</u>	<u>S</u>	<u>Trip Setpoint</u>	<u>Allowable Value</u>
18. Safety Injection Input from ESF	NA	NA	NA	NA	NA
19. Reactor Trip System Interlocks					
A. Intermediate Range Neutron Flux, P-6	NA	NA	NA	>7.5 x 10 <sup>-6</sup> % Indication	>4.5 x 10 <sup>-6</sup> % Indication
B. Low Power Reactor Trips Block, P-7					
a. P-10 input	7.5	4.56	0	≤10% of RTP	≤12.2% of RTP
b. P-13 input	7.5	4.56	0	<10% turbine impulse pressure equivalent	<12.2% of turbine impulse pressure equivalent
C. Power Range Neutron Flux P-8	7.5	4.56	0	≤38% of RTP	≤40.2% of RTP
D. Low Setpoint Power Range Neutron Flux, P-10	7.5	4.56	0	≥10% of RTP	≥7.8% of RTP
E. Turbine Impulse Chamber Pressure, P-13	7.5	4.56	0	<10% turbine impulse pressure equivalent	<12.2% turbine pressure equivalent
F. Power Range Neutron Flux, P-9	7.5	4.56	0	≤50% of RTP	≤52.2% of RTP
20. Reactor Trip Breakers	NA	NA	NA	NA	NA
21. Automatic Actuation Logic	NA	NA	NA	NA	NA

RTP = RATED THERMAL POWER

## LIMITING SAFETY SYSTEM SETTINGS

### BASES

#### Intermediate and Source Range, Nuclear Flux (Continued)

uncontrolled rod cluster control assembly bank withdrawal from a subcritical condition. These trips provide redundant protection to the low setpoint trip of the Power Range, Neutron Flux channels. The Source Range channels will initiate a reactor trip at about  $10^{+5}$  counts per second unless manually blocked when P-6 becomes active. The purpose of the P-6 setpoint, which is above the lower end of the intermediate range scale, is to give the operators sufficient time to actuate the source range reactor trip block. The Intermediate Range channels will initiate a reactor trip at approximately 25 percent of RATED THERMAL POWER unless manually blocked when P-10 becomes active.

#### Overtemperature $\Delta T$

The Overtemperature delta T trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that the transient is slow with respect to piping transit delays from the core to the temperature detectors (about 4 seconds), and pressure is within the range between the Pressurizer high and low pressure trips. The setpoint is automatically varied with 1) coolant temperature to correct for temperature induced changes in density and heat capacity of water and includes dynamic compensation for piping delays from the core to the loop temperature detectors, 2) pressurizer pressure, and 3) axial power distribution. With normal axial power distribution, this reactor trip limit is always below the core safety limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the reactor trip is automatically reduced according to the notations in Table 2.2-1.

#### Overpower $\Delta T$

The Overpower delta T trip provides assurance of fuel integrity (e.g., no fuel melting and less than 1 percent cladding strain) under all possible overpower conditions, limits the required range for Overtemperature delta T protection, and provides a backup to the High Neutron Flux trip. The setpoint is automatically varied with 1) coolant temperature to correct for temperature induced changes in density and heat capacity of water, and 2) rate of change of temperature for dynamic compensation for piping delays from the core to the loop temperature detectors to ensure that the allowable heat generation rate (Kw/ft) is not exceeded. The overpower  $\Delta T$  trip provides protection to mitigate the consequences of various size steam breaks as reported in WCAP 9226, "Reactor Core Response to Excessive Secondary Steam Break."

#### Pressurizer Pressure

In each of the pressure channels, there are two independent bistables, each with its own trip setting to provide for a high and low pressure trip thus limiting the pressure range in which reactor operation is permitted. The low setpoint trip protects against low pressure which could lead to DNB by tripping the reactor in the event of a loss of reactor coolant pressure.

## LIMITING SAFETY SYSTEM SETTINGS

### BASES

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#### Pressurizer Pressure (Continued)

On decreasing power the low setpoint trip is automatically blocked by P-7 (a power level of approximately 10 percent of RATED THERMAL POWER with turbine impulse chamber pressure at approximately 10 percent of full power equivalent); and on increasing power, automatically reinstated by P-7.

The high setpoint trip functions in conjunction with the pressurizer relief and safety valves to protect the Reactor Coolant System against system overpressure.

#### Pressurizer Water Level

The pressurizer high water level trip is provided to prevent water relief through the pressurizer safety valves. On decreasing power the pressurizer high water level trip is automatically blocked by P-7 (a power level of approximately 10 percent of RATED THERMAL POWER with a turbine impulse chamber pressure at approximately 10 percent of full equivalent); and on increasing power, automatically reinstated by P-7.

#### Loss of Flow

The Loss of Flow trips provide core protection to prevent DNB by mitigating the consequences of a loss of flow resulting from the loss of one or more reactor coolant pumps.

On increasing power above P-7 (a power level of approximately 10 percent of RATED THERMAL POWER or a turbine impulse chamber pressure at approximately 10 percent of full power equivalent), an automatic reactor trip will occur if the flow in more than one loop drops below 90% of nominal full loop flow. Above P-8 (a power level of approximately 38 percent of RATED THERMAL POWER) an automatic reactor trip will occur if the flow in any single loop drops below 90 percent of nominal full loop flow. Conversely on decreasing power between P-8 and the P-7 an automatic reactor trip will occur on loss of flow in more than one loop and below P-7 the trip function is automatically blocked.

#### Steam Generator Water Level

The steam generator water level low-low trip protects the reactor from loss of heat sink in the event of a sustained steam/feedwater flow mismatch resulting from loss of normal feedwater. The specified setpoint provides allowances for starting delays of the auxiliary feedwater system.

#### Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level

The steam/feedwater flow mismatch in coincidence with a steam generator low water level trip is not used in the transient and accident analyses but is included in Table 2.2-1 to ensure the functional capability of the specified trip settings and thereby enhance the overall reliability of the Reactor Protection System. This trip is redundant to the Steam Generator Water Level Low-Low trip. The Steam/Feedwater Flow Mismatch portion of this trip is activated when the steam flow exceeds the feedwater flow by greater than or equal to  $1.63 \times 10^6$  lbs/hour. The Steam Generator Low Water level portion of the trip is activated when the water level drops below the programmed low



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 65 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

INTRODUCTION

By letter dated January 8, 1987, South Carolina Electric and Gas Company (the licensee) requested an amendment to the Technical Specifications. The amendment would change the trip setpoint and the allowable value listed in Technical Specification Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints" for the intermediate range compensated ion chamber detectors from current (AMPS) to the equivalent percent indication. The Bases would also be changed to reflect percent indication and to provide further clarification regarding the P-6 setpoint. These changes would meet the guidelines of Regulatory Guide 1.97 Revision 3 requirements for Post Accident Neutron Monitoring Instrumentation.

EVALUATION

The change to the Technical Specifications is being submitted because of a necessary modification to meet Regulatory Guide 1.97 Revision 3 requirements for Post Accident Neutron Monitoring Instrumentation. This modification will replace the present non-post accident qualified Source Range (SR) BF3 detectors and Intermediate Range (IR) Compensated Ion Chamber detectors with Class 1E, post accident qualified fission chamber detectors.

Instrument ranges and scales of the existing detectors versus the replacement detectors are as follows:

Detector	BF3	Fission Chamber
SR	$10^0 - 10^6$ cps	$10^0 - 10^6$ cps
IR	$10^{-11} - 10^{-3}$ amps	$10^{-8} - 2 \times 10^2$ % Indication

This change is administrative in that no setpoints are being changed. The intermediate range setpoint and allowable values are being converted from current to the equivalent percent indication.

The equivalent values are based on typical three loop Westinghouse plant data. A check using V.C. Summer cycle I startup data was performed and was in agreement with the selected typical plant value ( $8.3 \times 10^{-6}$  vs  $7.5 \times 10^{-6}$  percent indication). Also, the slight difference is in the conservative direction by selecting the typical plant value for the trip setpoint. The allowable value of  $4.5 \times 10^{-6}$  percent indication was obtained by interpolation. The NRC staff finds the intermediate range P-6 trip setpoint and allowable value equivalent acceptable.

The change to the Bases which states that the P-6 setpoint is selected such that the operators will have sufficient time to actuate the source range reactor trip block is a clarifying statement. Therefore, the NRC staff finds the Bases clarification regarding the P-6 trip setpoint acceptable.

#### ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation 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 Section 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.

#### CONCLUSION

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.

Dated: April 14, 1987

#### Principal Contributors:

J. B. Hopkins, Project Directorate #2, DPLA