

November 14, 2000

Mr. Stephen A. Byrne  
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: ULTIMATE HEAT SINK (TAC NO. MA9305)

Dear Mr. Byrne:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 149 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 June 12, 2000. The proposed amendment would revise Technical Specification 3/4.7.5, "Ultimate Heat Sink," by increasing the minimum required service water pond level from 415 feet to 416.5 feet and decreasing the maximum allowed temperature at the discharge of the service water pumps from 95 degrees Fahrenheit to 90.5 degrees Fahrenheit.

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. MA9305.

Sincerely,

/RA/

Karen 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. 149 to NPF-12
2. Safety Evaluation

cc w/encls: See next page

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AMENDMENT NO. 149 TO FACILITY OPERATING LICENSE NO. NPF-12 - SUMMER, UNIT  
NO. 1

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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

**VIRGIL C. SUMMER NUCLEAR STATION**

cc:

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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. 149  
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 June 12, 2000, 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. 149, 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



Richard L. Emch, Jr., 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: November 14, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 149

TO FACILITY OPERATING LICENSE NO. NPF-12

DOCKET NO. 50-395

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove Page

3/4 7-13

Insert Page

3/4 7-13

## PLANT SYSTEMS

### 3/4.7.5 ULTIMATE HEAT SINK

#### LIMITING CONDITION FOR OPERATION

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- 3.7.5 The service water pond (ultimate heat sink) shall be OPERABLE with:
- a. A minimum water level at or above elevation 416.5 Mean Sea Level, USGS datum, and
  - b. A water temperature of less than or equal to 90.5°F at the discharge of the service water pumps.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

With the requirements of the above specification not satisfied, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

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4.7.5 The service water pond shall be determined OPERABLE at least once per 24 hours by verifying the water temperature and water level to be within their limits.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 149 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 June 12, 2000, South Carolina Electric & Gas Company (SCE&G, the licensee) requested changes to the Technical Specifications (TS) for the Virgil C. Summer Nuclear Station (VCSNS). The proposed amendment would revise Technical Specification 3/4.7.5, "Ultimate Heat Sink," by increasing the minimum required service water pond level from 415 feet to 416.5 feet and decreasing the maximum allowed temperature at the discharge of the service water pumps from 95 degrees Fahrenheit to 90.5 degrees Fahrenheit. The proposed change is in response to findings during a service water system (SWS) functional review.

### 2.0 BACKGROUND

The SWS provides water from the service water pond (ultimate heat sink) for cooling of the emergency diesel generators, component cooling heat exchangers, heating ventilating and air conditioning (HVAC) mechanical water chiller condensers, and the service water pump house cooling coils. The SWS is capable of satisfying its performance requirements at a maximum design temperature of 95 degrees Fahrenheit. The service water pond supplies water for the SWS under normal and emergency operating conditions. Currently, Summer TS 3/4.7.5 specifies that the service water pond shall be operable with a minimum water level at or above elevation 415 Mean Sea Level, and a water temperature of less than or equal to 95 degrees Fahrenheit at the discharge of the service water pumps.

### 3.0 EVALUATION

Regulatory Guide (RG) 1.27 requires that the capacity of the heat sink should be sufficient to provide cooling for the dissipation of residual heat after reactor shutdown and dissipation of residual heat after an accident. Additionally, the capacity of the sink should be sufficient to provide cooling both for the period of time needed to evaluate the situation and for the period of time needed to take corrective action. Sufficient conservatism should be provided to ensure that a 30-day supply of water is available.

The VCSNS SWS review determined that the service water pond temperature limit specified in the VCSNS TS needed to be decreased to account for the expected temperature rise in the service water pond during the design-basis loss-of-coolant accident (LOCA). The licensee performed a new thermal study of the service water pond and developed a calibrated service water pond thermal model following the recommendation in RG 1.27, Revision 2. Using the calibrated service water pond thermal model and the existing design basis for the service water pond, the licensee evaluated the expected temperature rise at the SWS inlet for a hypothetical LOCA and a normal shutdown. In order to impose the most severe thermal condition of the service water pond, the licensee assumed that VCSNS was operating at 102 percent of rated thermal power prior to the postulated incident. For the design-basis LOCA, the licensee also assumed the following conditions:

1. Prior to and during the LOCA, equipment heat loads on the SWS were assumed at maximum design values.
2. The heat load to the reactor building (RB) was based on the LOCA mass and energy releases [that] released the largest amount of energy to the containment.... The double-ended pump suction break was chosen as the break type and location for the study.
3. Energy transport from the RB to the SWP [service water pond] was maximized by assuming both trains of RB cooling [were] available. Heat removal by the RBCUs [reactor building cooling units] was maximized by assuming zero fouling, maximum airflow, and maximum service water flow.
4. Energy transport from the RHR [residual heat removal] system during recirculation... was maximized by assuming both trains were available, clean-unfouled heat exchangers, and maximum flow.

The licensee's analysis demonstrated that, at an initial service water pond temperature of 90.92 degrees Fahrenheit at LOCA initiation, the maximum service water pond temperature was 95.12 degrees Fahrenheit approximately 10 days following the LOCA. Sensitivity studies on the thermal model indicate that the SWS 95 degree Fahrenheit design limit can be met under worst-case conditions by restricting either the pre-incident service water intake temperature to less than or equal to 90.65 degrees Fahrenheit or the pre-incident service water pond level to greater than or equal to 416.5 feet. The licensee has requested that TS 3/4.7.5 be changed to incorporate a minimum water level of 416.5 feet and a maximum water temperature of 90.5 degrees Fahrenheit.

The licensee stated that uncertainties associated with the measurement of the service water pond level and the service water pump discharge temperature will be included within plant procedures to ensure the plant is operated within the bounds of the analysis.

Based on the licensee's analysis, the maximum design temperature of the SWS is met and the 30-day supply of service water pond water is satisfied. The staff concludes that the proposed changes impose more restrictive operating limitations on the service water pond and provide

increased assurance that the SWS design temperature will not be exceeded. The proposed TS changes are based on analyses that are consistent with RG 1.27, Revision 2. Therefore, the staff concludes that the proposed changes to TS 3/4.7.5 are 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. 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 (65 FR 46015). 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 submittal and supporting documentation. The licensee has shown that the maximum SWS design temperature of 95 degrees Fahrenheit can be met under worst-case conditions by restricting either the pre-incident service water intake temperature to less than or equal to 90.65 degrees Fahrenheit or the pre-incident service water pond level to greater than or equal to 416.5 feet. The staff concludes that the proposed changes to TS 3/4.7.5 impose more restrictive operating limitations on the service water pond and provide increased assurance that the SWS design temperature will not be exceeded. Therefore, the staff concludes that the proposed changes to TS 3/4.7.5 are acceptable and that there is reasonable assurance that plant operation in this manner poses no undue risk to the health and safety of the public.

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 Contributors: K. Kavanagh

Date: November 14, 2000