

April 5, 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: REVISION TO ALLOWED OUTAGE TIME FOR
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
INSTRUMENTATION CHANNELS (TAC NO. MB7978)

Dear Mr. Byrne:

The U. S. Nuclear Regulatory Commission (Commission, NRC) has issued the enclosed Amendment No. 167 to Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit No. 1. The amendment changes the Technical Specifications (TSs) in response to your application dated February 25, 2003, as supplemented September 9, 2003.

The amendment will add an allowed outage time for Engineered Safety Features Actuation System Instrumentation channels to be out of service in a bypassed state. These channels are energized to actuate and are currently permitted by the TSs to be placed in a bypassed state indefinitely. This amendment will provide a limitation on the amount of time any of the above channels may be placed in bypass. The Office of Nuclear Reactor Regulation staff reviewed the proposed changes and found them acceptable.

A copy of the related Safety Evaluation is enclosed. The 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. 167 to NPF-12
2. Safety Evaluation

cc w/enclosures: See next page

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South Carolina Electric & Gas Company

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Office of Nuclear Reactor Regulation

Docket No. 50-395

Package: ML041060131

TSPages: ML041040493

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2. Safety Evaluation

cc w/enclosures: See next page

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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 FACILITY OPERATING LICENSE

Amendment No. 167
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 February 25, 2003, as supplemented September 9, 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 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. 167, 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/

John A. Nakoski, 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: April 5, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 167

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 3-20
3/4 3-23
3/4 3-24
3/4 3-28
3/4 3-37

Insert Pages

3/4 3-20
3/4 3-23
3/4 3-24
3/4 3-28
3/4 3-37

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 167 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

Licensee Event Report (LER) 50/395 2000-004-00 described a scenario where a condition could occur that would prevent the automatic actuation of the “energize to actuate” functions of the Engineered Safety Features Actuation System (EFSAS). This condition is, in part, caused by the current technical specification (TS) action statement that allows specific instrumentation channels to be placed in bypass for an indefinite period of time. The affected channels are the level channels for the refueling water storage tank that initiate the semiautomatic swap-over to the reactor building recirculation sumps; the pressure channels in the suction piping to the emergency feedwater (EFW) pumps that initiate the swap-over to the safety-related source of water; and the reactor building pressure channels that initiate the containment spray system. By application dated February 25, 2003, as supplemented September 9, 2003, South Carolina Electric & Gas Company (the licensee) requested changes to the TSs for the Virgil C. Summer Nuclear Station (VCSNS). The amendment requested would permit placing one of the affected channels, per function, in trip; therefore, assuring that the protection logic will be satisfied and automatic actuation could occur if needed. The proposed changes will add an allowed outage time (AOT) to Table 3.3-3, ESFAS Instrumentation channels to be out of service in a bypassed state. The TS change request states the affected channel will be restored within 6 hours or the plant will be in hot standby (Mode 3) within the next 6 hours.

The purpose for this change is to resolve a condition where, due to a newly determined single-failure consideration, the above functions may not automatically occur when needed. This would only occur if one or more functions had one channel in bypass with a coincident design basis accident (DBA) and a specific direct current power failure. The current TSs permit placing one inoperable channel per function in bypass for an indefinite period of time. This amendment will provide a limitation on the amount of time any of the above channels may be placed in bypass.

The proposed amendment will also revise TS 3/4.3.2, Tables 3.3-3 and 3.3-4, to incorporate consistent applicability and action for ESFAS Instrumentation, Functional Unit 5.b., Automatic Actuation Logic and Actuation Relay for Turbine Trip and Feedwater Isolation. This change adds an action statement to help provide consistency. Currently, Table 4.3-2 has this functional unit, whereas Tables 3.3-3 and 3.3-4 do not identify this same functional unit. This change will

Enclosure

provide consistency between Tables 3.3-3, 3.3-4, and 4.3-2, and will be similar to the equivalent requirement in the "Standard Technical Specifications Westinghouse Plants," NUREG-1431, Revision 2.

Additionally, Table 3.3-4, ESFAS Instrumentation Trip Setpoints, Functional Unit 4.e., Steam Line Isolation - Steamline Pressure - Low, does not have a corresponding functional unit on Table 4.3-2, to assure that the surveillance requirements are being met. This administrative change to Functional Unit 4.e. is added to Table 4.3-2, to provide consistency with the surveillance requirements. These requirements are currently met by Functional Unit 1.f.; however, this administrative change provides a one-for-one correspondence between Tables 3.3-3, 3.3-4, and 4.3-2.

In a request additional information (RAI), the U.S. Nuclear Regulatory Commission (NRC) requested that a discussion of plant design be provided to explain why placing one of the inoperable channels in trip will not increase the probability of inadvertent actuations of containment spray or premature swap-over to safety-related water sources. As stated in a letter dated September 9, 2003, after review, VCSNS determined that placing a channel of the refueling water storage tank to Reactor Building sump swap-over in the tripped condition would increase the probability of an inadvertent actuation. Inadvertent swap-over of EFW suction to Service Water was determined to be a commercial risk, therefore, VCSNS withdrew the request to place either the EFW suction swap-over to a safety related water supply or the containment spray initiation on high building pressure in trip. The RAI additionally requested a TS Bases change that would document why TS Action (Action 25) was so much more conservative than the Standard Technical Specifications (STSS) or the Improved TSs (ITSS). The additional conservatism was eliminated.

The September 9, 2003, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination or expand the scope of the application.

2.0 REGULATORY EVALUATION

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. In Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR), the Commission established the regulatory requirements related to the content of TSs. That regulation requires the TSs to include items in five specific categories, including: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements; (4) design features; and (5) administrative controls. However, the regulation does not specify the particular requirements to be included in the TSs.

The NRC developed criteria, as described in the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 FR 39132), to determine which of the design conditions and associated surveillance should be located in the TSs as LCOs.

Generic Letter (GL) 80-30 (issued to provide clarification of the term "operable" as it applies to single failure criterion for safety systems required by TSs) states that the STSS were formulated to preserve the single-failure criterion for systems that are relied on in the safety analysis report. By and large, specifying LCOs preserve the single-failure criterion. When the required

redundancy is not maintained, action is required within a specified time to place the plant in a safe condition. The specified time in which to take action is temporary relaxation of the single-failure criterion. These provisions have been formulated to assure that no set of equipment outages would be allowed to persist that would result in the facility being in an unprotected condition.

3.0 TECHNICAL EVALUATION

3.1 Table 3.3-3, Action Statement 16

The licensee proposed to add an AOT of 6 hours to Table 3.3-3, Engineered Safety Features Actuation System (ESFAS) Instrumentation, Action Statement 16, that will state an inoperable channel may be placed in bypass for no more than 6 hours; otherwise, the channel would have to be placed in the tripped condition or the plant would have to be shut down. LER 50/309 2000-004 described a scenario where a condition could occur that would prevent the automatic actuation of the "energize to actuate" functions. This condition is, in part, caused by the current Action Statement 16 that allows specific instrumentation channels to be placed in bypass for an indefinite period of time. Establishing an AOT will assure the channels remain operable and permit single-failure requirements to be satisfied.

During the LCO, the licensee does not have to postulate a single-failure coincident with the DBA due to the limited time the system is inoperable and the low probability of the DBA occurring. This philosophy follows the guidance in NRC GL 80-30, Institute of Electrical and Electronics Engineers standard 279-1979 (IEEE 279-1979), "Criteria for Protection Systems for Nuclear Power Generating Stations," and American National Standards Institute document 58.9-1981 (ANSI 58.9-1981), "Single Failure Criteria for LWR [Light-Water Reactor] Safety-Related Fluid Systems." The single-failure criterion is preserved by specifying LCOs that require all redundant components of safety-related systems to be operable. When the required redundancy is not maintained, either due to equipment failure or maintenance outage, action is required within a specified time to change the operating mode of the plant to place it in a safe condition. Providing a specified time period will bring the plant into conformance with the design basis.

By letter dated June 18, 1991, the NRC staff issued a Safety Evaluation (SE) on the license amendment for VCSNS, Unit 1, approving the application of Supplement 2, Revision 1, to WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Time for the Reactor Protection Instrumentation System." The SE approved (1) an increase in the AOT for testing of ESFAS analog channels from 2 hours to 4 hours, (2) an AOT outage time for testing of 4 hours for all components in solid state systems, and (3) testing in bypass during the maintenance allowed outage time with an analog channel tripped after spending 6 hours in bypass. Therefore, the AOT of 6 hours is an acceptable time to restore the channel or take the required action.

The licensee's review of plant operating logs had shown that there have not been any of these channels in bypass for longer than 20 hours within the last 7 years. Additionally, there was never a loss of operator action from the control room to manually actuate the required components. Procedural guidance located in Emergency Operating Procedures requires that all expected automatic Engineered Safety Features actuations be verified or be manually actuated if the automatic actuation does not occur as expected. As the licensee indicated in its

submittal, the plant specific probabilistic risk analysis calculation performed for LER 2000-004-00 evaluated the probability and consequences of this condition and concluded that this event has a very low probability of occurrence. The probabilistic safety analysis model for VCSNS takes no credit for the EFW suction swap-over; meaning that this is not a contributor to core damage from a risk-significance view point. Based on the 6-hour AOT, the resulting core damage frequency change is $2.4E-8$ with the large early release frequency change being $1.7E-10$. These numbers demonstrate that there is a very low probability of the DBA occurring while the plant is in this configuration and the consequences are nonsignificant. Therefore, 6 hours is more than adequate to ensure that the plant is maintained in a safe configuration and meets 10 CFR 50.36 requirements. As such, the NRC staff determined that the proposed Action Statement 16 with an AOT of 6 hours is acceptable.

3.2 Table 4.3-2, Functional Unit 5.b.

Table 4.3-2, Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements, Applicability, and Action for Functional Unit 5.b., Automation Actuation Logic and Actuation Relay are not reflected in TS Tables 3.3-3 and 3.3-4. This is a corrective change to reflect the consistent application of Functional Unit 5.b. The NRC staff reviewed the TSs and determined that the proposed change to Tables 3.3-3 and 3.3-4 to include Functional Unit 5.b. is correct and is also consistent with the ITSS, NUREG-1431, Rev. 2. There were no physical or procedural changes to reflect the addition of Functional Unit 5.b., Automatic Actuation Logic and Actuation Relay associated with the Turbine Trip and Feedwater Isolation ESFAS Instrumentation. The proposed change is acceptable, as this is an administrative change and does not affect the compliance with 10 CFR 50.36.

3.3 Table 3.3-3, Functional Unit 5.b, Action Statement 25

The licensee proposed change to provide consistent control by including an AOT limit for TS 3/4.3.2, Table 3.3-3, Functional Unit 5.b. through adding Action Statement 25. This is a more conservative application of the actions taken in the event of an inoperable channel of the functional unit. The 6-hour AOT is based on the other train being operable and the low probability of an event occurring during this interval as discussed in Action Statement 16 (see Section 3.1 of this SE above). This action provides an additional conservatism to the current TS by placing a further restriction on the ESFAS Instrumentation Surveillance Requirements. The proposed change is acceptable, as it meets 10 CFR 50.36 requirements.

3.4 Table 4.3-2, Functional Unit 4.e

Table 3.3-4, ESFAS Instrumentation Trip Setpoint, Functional Unit 4.e., Steam Line Isolation, Steam Pressure - Low, does not have a corresponding functional unit on TS Table 4.3-2, to assure that the surveillance requirements are being met. This administrative change to Functional Unit 4.e. is added to Table 4.3-2, to provide consistency with the surveillance requirements. Currently, the surveillance requirement is met by Functional Unit 1.f.; however, this administrative change provides a one-for-one correlation between Tables 3.3-3, 3.3-4, and 4.3-2. The NRC staff determined that adding the surveillance requirements for Functional Unit 4.e. to Table 4.3-2 resolves this discrepancy and does not affect compliance to 10 CFR 50.36 and, therefore, 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 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 (68 FR 15762). 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: S. Rhow

Date: April 5, 2004