



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

October 5, 2018

Mr. George A. Lippard, III  
Vice President, Nuclear Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
P.O. Box 88, Mail Code 800  
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 – ISSUANCE OF  
AMENDMENT RE: TECHNICAL SPECIFICATION CHANGE REQUEST FOR  
THE REVISION OF THE SURVEILLANCE FREQUENCY OF THE TURBINE  
TRIP FUNCTIONAL UNIT (EPID L-2018-LLA-0085)

Dear Mr. Lippard:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 212 to Renewed Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit No. 1, in response to your application dated April 3, 2018, as supplemented by letter dated August 22, 2018.

This amendment changes Technical Specification Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements" Functional Units 17.A, Turbine Trip - Low Fluid Oil Pressure, and 17.B, Turbine Trip - Turbine Stop Valve Closure. Specifically, the Trip Actuating Device Operational Test column of Table 4.3-1 is revised to delete performing the 17.A and 17.B surveillance requirements prior to reactor startup (S/U) and replacing these surveillance requirements with a reference to Table Notation (8), that states 17.A and 17.B surveillance requirements will be conducted "Prior to entering MODE 1 whenever the unit has been in MODE 3."

G. Lippard

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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,

A handwritten signature in cursive script, appearing to read "Shawn A. Williams".

Shawn A. Williams, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosures:

1. Amendment No. 212 to NPF-12
2. Safety Evaluation

cc: Listserv



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 RENEWED FACILITY OPERATING LICENSE

Amendment No. 212  
Renewed License No. NPF-12

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Virgil C. Summer Nuclear Station, Unit No. 1 (the facility), Renewed Facility Operating License No. NPF-12 filed by the South Carolina Electric & Gas Company (the licensee), dated April 3, 2018, as supplemented by letter dated August 22, 2018, 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 as set forth in 10 CFR Chapter I;
  - 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.

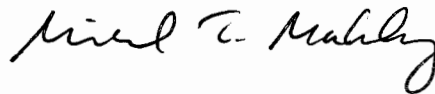
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-12 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 212, 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 7 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility Operating  
License and Technical Specifications

Date of Issuance: October 5, 2018

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

ATTACHMENT TO LICENSE AMENDMENT NO. 212

RENEWED FACILITY OPERATING LICENSE NO. NPF-12

DOCKET NO. 50-395

Replace the following pages of the Renewed Facility Operating License and Appendix A, Technical Specifications (TSs), with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

Insert

License  
Page 3

License  
Page 3

TS  
3/4 3-12  
3/4 3-14

3/4 3-12  
3/4 3-14

- (3) SCE&G, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as amended through Amendment No. 33;
- (4) SCE&G, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed neutron sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (5) SCE&G, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (6) SCE&G, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed license shall be deemed to contain, and is subject to, the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

SCE&G is authorized to operate the facility at reactor core power levels not in excess of 2900 megawatts thermal in accordance with the conditions specified herein and in Attachment 1 to this renewed license. The preoperational tests, startup tests and other items identified in Attachment 1 to this renewed license shall be completed as specified. Attachment 1 is hereby incorporated into this license.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 212, 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.

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| <u>FUNCTIONAL UNIT</u>   | <u>CHANNEL CHECK</u> | <u>CHANNEL CALIBRATION</u> | <u>ANALOG CHANNEL OPERATIONAL TEST</u> | <u>TRIP ACTUATING DEVICE OPERATIONAL TEST</u> | <u>ACTUATION LOGIC TEST</u> | <u>MODES FOR WHICH SURVEILLANCE IS REQUIRED</u> |
|--|----------------------|----------------------------|--|---|-----------------------------|---|
| 13. Steam Generator Water Level-- Low-Low  | S                    | R                          | SA                                     | N.A.  | N.A.                        | 1,2   |
| 14. Steam Generator Water Level - Low Coincident with Steam/ Feedwater Flow Mismatch | S                    | R                          | SA                                     | N.A.  | N.A.                        | 1, 2  |
| 15. Undervoltage - Reactor Coolant Pumps   | N.A.                 | R                          | N.A.                                   | SA  | N.A.                        | 1   |
| 16. Underfrequency - Reactor Coolant Pumps   | N.A.                 | R                          | N.A.                                   | SA  | N.A.                        | 1   |
| 17. Turbine Trip   |                      |                            |  |   |                             |   |
| A. Low Fluid Oil Pressure  | N.A.                 | R                          | N.A.                                   | (1, 8, 10)                                    | N.A.                        | 1   |
| B. Turbine Stop Valve Closure  | N.A.                 | R                          | N.A.                                   | (1, 8, 10)                                    | N.A.                        | 1   |
| 19. Reactor Trip System Interlocks   |                      |                            |  |   |                             |   |
| A. Intermediate Range Neutron Flux, P-6  | N.A.                 | R(4)                       | R                                      | N.A.  | N.A.                        | 2##   |
| B. Low Power Reactor Trips Block, P-7  | N.A.                 | R(4)                       | R                                      | N.A.  | N.A.                        | 1   |
| C. Power Range Neutron Flux, P-8   | N.A.                 | R(4)                       | R                                      | N.A.  | N.A.                        | 1   |

SUMMER - UNIT 1

3/4 3-12

Amendment No. 104, 209, 212

TABLE 4.3-1 (Continued)

TABLE NOTATION

- \* - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.
- ## - Below P-6 (Intermediate Range Neutron Flux Interlock) setpoint.
- ### - Below P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint.
- (1) - If not performed in previous 31 days.
- (2) - Comparison of calorimetric to excore power indication above 15% of RATED THERMAL POWER. Adjust excore channel gains consistent with calorimetric power if absolute difference is greater than 2 percent. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.
- (3) - Single point comparison of incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference is greater than or equal to 3 percent. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.
- (4) - Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (5) - Detector plateau curves shall be obtained evaluated and compared to manufacturer's data. For the Power Range Neutron Flux Channels the provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.
- (6) - Incore - Excore Calibration, above 75% of RATED THERMAL POWER. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.
- (7) - Each train shall be tested at least every 124 days on a STAGGERED TEST BASIS.
- (8) - Prior to entering MODE 1 whenever the unit has been in MODE 3.
- (9) - Surveillance in MODES 3\*, 4\* and 5\* shall also include verification that permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window.
- (10) - Setpoint verification is not required.
- (11) - The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s).
- (12) - The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers.
- (13) - Local manual shunt trip prior to placing breaker in service.
- (14) - Automatic undervoltage trip.
- (15) - Each train shall be tested at least every 184 days on a Staggered Test Basis.
- (16) 12 hours after reducing power below P-10 and 184 days thereafter.
- (17) 4 hours after reducing power below P-6 and 4 hours after entering MODE 3 from MODE 2 and 184 days thereafter.
- (18) If not performed in previous 184 days.





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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 212 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By letter dated April 3, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18094A189), as supplemented by letter dated August 22, 2018 (ADAMS Accession No. ML18234A511), South Carolina Electric & Gas Company (SCE&G, the licensee) submitted a license amendment request to modify the Virgil C. Summer Nuclear Station (VCSNS), Unit No. 1, Technical Specifications (TSs).

This amendment changes Technical Specification Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements" Functional Units 17.A, Turbine Trip - Low Fluid Oil Pressure, and 17.B, Turbine Trip - Turbine Stop Valve Closure. Specifically, the Trip Actuating Device Operational Test (TADOT) column of Table 4.3-1 is revised to delete performing the 17.A and 17.B surveillance requirements prior to reactor startup (S/U) and replacing these surveillance requirements with a reference to Table Notation (8), that states 17.A and 17.B surveillance requirements will be conducted "Prior to entering MODE 1 [Power Operation] whenever the unit has been in MODE 3 [Hot Standby]."

The supplemental letter dated August 22, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC, or the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on May 22, 2018 (83 FR 23736).

2.0 REGULATORY EVALUATION

2.1 System Description

The licensee describes the reactor trip on turbine trip as an anticipatory trip input signal to the reactor protection system. This trip function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip and acts to minimize the pressure/temperature transient on the Reactor Coolant System (RCS). The reactor trip on a turbine trip is actuated by

a 2 out of 3 logic from the emergency trip fluid pressure signals or by all closed signals from the turbine steam stop valves. A turbine trip initiates a reactor trip when above the P-9 interlock, which is defined as a power level less than or equal to 50% of rated thermal reactor power. The turbine provides anticipatory trips to the reactor protection system from contacts that change position when the turbine stop valves close or when the turbine emergency trip fluid pressure goes below its setpoint. The anticipatory trips meet IEEE 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations" including separation redundancy, single failure, and sustainability.

The current reactor trip system instrumentation surveillance requirements 17.A and 17.B, require the surveillance requirement to be performed prior to MODE 2 (reactor startup). When performed prior to reactor startup, the only heat input to the system is that from decay heat and the reactor coolant pumps. The licensee states that when the main turbine is reset prior to performing this surveillance requirement, the main stop valves open causing a sudden demand on the main steam supply. Given the limited amount of heat available prior to reactor startup, this sudden demand will drop the main steam pressure with a corresponding drop in the RCS pressure. The licensee stated that the drop in RCS pressure and main steam pressure may result in a safety injection signal that will occur if the pressurizer pressure drops to 1,850 psig or the steam line pressure drops to 675 psig.

## 2.2 Description of Changes

The proposed change revises Functional Units 17.A and 17.B of TS Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements." The surveillance frequency of prior to each reactor startup (S/U) in the TADOT column of this table will be deleted and replaced with a reference to revised Table Notation (8) which would state: "Prior to entering MODE 1 whenever the unit has been in MODE 3." The proposed surveillance frequency does not alter current Table Notations 1 and 10 that state "If not performed in previous 31 days" and "Setpoint verification is not required," respectively.

## 2.3 Regulatory Review

In Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical Specifications," the NRC established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36(c), TSs are required to include items in the following five specific categories related to plant operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls.

Appendix A to 10 CFR Part 50, "General Design Criteria," provides the design requirements for protection systems associated with reactor operation in General Design Criteria (GDC) 20 through 29. Section II.K.3.12 of Enclosure 3 of NUREG-0737, "Clarification of TMI Action Plan Requirements," (ADAMS Accession No. ML051400209) requires Westinghouse plants to include an anticipatory reactor trip upon turbine trip function in the reactor trip system.

The NRC published a set of Standard Technical Specifications (STS) in NUREG-1431, Revision 4 "Standard Technical Specifications, Westinghouse Plants" (ADAMS Accession No. ML12100A222). The STS provide model format and content for TSs that satisfy the regulations contained in 10 CFR 50.36. The STS are not requirements, but licensees adopting portions of the STS to existing TSs should adopt all related requirements, as applicable, to achieve a high degree of standardization and consistency. Technical Specification Task Force (TSTF)

Standard Technical Specification Change Traveler TSTF-311, "Revision of Surveillance Frequency for TADOT on Turbine Trip Functional Unit," (ADAMS Accession No. ML040620175) proposed changes to revise the Frequency and associated Bases for performing a TADOT on Functional Unit 16, Turbine Trip. This corresponds to Functional Unit 17, Turbine Trip, in the VCSNS TSs.

The TS changes contained in the licensee's amendment request were evaluated by comparing them to the applicable GDC and requirements listed in NUREG-0737. The amendment was also compared to the STS in NUREG-1431 and TSTF-311 for consistency.

### 3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the proposed change to Functional Units 17.A and 17.B of TS Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements." The proposed change from "Prior to each reactor startup" to "Prior to entering MODE 1 whenever the unit has been in MODE 3," would allow the surveillance requirement to be performed in MODE 2, whereas it currently is required to be performed prior to entering MODE 2.

The licensee states that "This change is desired because of the significant risk of causing a Safety Injection (SI) during the performance of this surveillance test prior to reactor startup. The steam demand required for this surveillance causes a cooldown of the Reactor Coolant System (RCS), and with very low decay heat, produces a large cooldown and depressurization. This configuration increases the potential of causing a SI due to the rapid cooldown and depressurization of the Main Steam and RCS."

#### NRC Staff Evaluation

The turbine trips are not credited as the primary actuation of a reactor trip for any VCSNS postulated event. They are provided to enhance the overall reliability of the reactor protection system. The NRC staff finds that the proposed change is more conservative than the latest version of the standard TSs (NUREG-1431, Revision 4) and NRC approved TSTF-311, in that these documents allow the surveillance in MODE 1 prior to exceeding the P-9 interlock. The NRC staff finds that the proposed change will not adversely affect the ability of the reactor trip system to generate the required trip signal for turbine trip events.

The Turbine Trip functions are not required to provide a reactor trip until the reactor is in MODE 1 and power is above the P-9 logic setpoint (which is defined as  $\leq 50\%$  rated thermal power). The NRC staff finds that the proposed revision to change the turbine trip function surveillance frequency to before the reactor is in MODE 1 achieves the appropriate requirement to have an operable trip function when the system is capable of initiating the required reactor trip signal.

Given the risk of generating an SI during performance of the surveillance with very low decay heat, the NRC staff asked the licensee to confirm that performing this surveillance in MODE 2 does not increase the risk of generating an SI signal. In addition, the NRC staff asked the licensee to confirm that performing this surveillance at low power (i.e., in MODE 2 where power could be up to 5% rated thermal power) does not have any unintended consequences. In its letter dated August 22, 2018, the licensee responded that performance of this surveillance while the plant is in MODE 2 would not increase the risk of generating an SI signal or result in any unintended consequences. In its letter dated August 22, 2018, the licensee stated that allowing the test to be performed with reactor power sufficient (up to 5%) will prevent an SI due to the

rapid cooldown and depressurization of the main steam line and RCS. While at low power (i.e., in MODE 2), the steam header pressure would be maintained during the surveillance by additional steam flow from the steam generators. Because the reactor would be critical above the point of adding heat, the additional steam flow would cause a small power increase instead of RCS cooldown. The NRC staff finds that there is no additional risk in performing the surveillance prior to entering MODE 1 and is, therefore, acceptable. .

The proposed surveillance frequency is consistent with the function applicability requirements and the VCSNS design and analysis for the turbine trip safety function. There is no proposed change to any design, therefore, the GDCs continue to be met with the proposed TS changes. The requirements of NUREG-0737 also continue to be met. While the format of the VCSNS TSs does not match that of the STS, NRC staff finds that the proposed changes bring the content of VCSNS TS into closer alignment with the content of the STS.

#### NRC Staff Conclusion

The regulations at 10 CFR 50.36 require that TSs include items in specified categories, including Limiting Conditions for Operation and Surveillance Requirements (SRs). The proposed changes modify the SRs applicable to the turbine trip functional unit. The TSs continue to specify the appropriate SRs for tests and inspections to ensure the necessary quality of affected structures, systems and components is maintained. The NRC staff finds that the proposed SRs meet the requirements of 10 CFR 50.36(c)(2) and 50.36(c)(3), respectively.

#### 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 on September 18, 2018. On September 24, 2018, the State official confirmed that the State of South Carolina had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the 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 as published in the *Federal Register* on May 22, 2018 (83 FR 23736). 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) there is reasonable assurance that 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: Robert Beaton, NRR

Date: October 5, 2018

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 – ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATION CHANGE REQUEST FOR THE REVISION OF THE SURVEILLANCE FREQUENCY OF THE TURBINE TRIP FUNCTIONAL UNIT (EPID L-2018-LLA-0085) DATED OCTOBER 5, 2018

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\*by memo

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| DATE   | 9/18/18        | 09/14/18       | 9/6/18         | 9/6/18         |
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