



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

August 18, 2015

Mr. Thomas D. Gatlin  
Vice President, Nuclear Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
Post Office Box 88, Mail Code 800  
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 - ISSUANCE OF  
AMENDMENT TO REVISE THE RADIATION EMERGENCY PLAN  
(TAC NO. MF5458)

Dear Mr. Gatlin:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 201 to Renewed Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit 1, in response to your application dated December 19, 2014. This amendment approves expansion of the Emergency Planning Zone (EPZ) boundary, a revision to the Evacuation Time Estimates analysis, and a revision to the Alert and Notification System design reports to encompass the expanded EPZ boundary.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, reading "Shawn Williams", is positioned above the typed name.

Shawn 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. 201 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 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 201  
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 1, (the facility) Renewed Facility Operating License No. NPF-12 filed by the South Carolina Electric & Gas Company (the licensee), dated December 19, 2014, 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.

Enclosure 1

2. Accordingly, by Amendment No. 201, Renewed Facility Operating License No. NPF-12 is hereby amended to authorize revision to the Virgil C. Summer Unit 1 Radiation Emergency Plan as set forth in South Carolina Electric & Gas Company's application dated December 19, 2014, and evaluated in the NRC staff's safety evaluation dated August 18, 2015.

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. 201, 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 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*Michelle H. Evans for*

William M. Dean, Director  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. NPF-12

Date of Issuance: August 18, 2015

ATTACHMENT TO  
LICENSE AMENDMENT NO. 201  
RENEWED FACILITY OPERATING LICENSE NO. NPF-12  
DOCKET NO. 50-395

Replace the following page of the Renewed Facility Operating License No. NPF-12 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove Pages

NPF-12, Page 3

Insert Pages

NPF-12, Page 3

- (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. 201, 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.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 201 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By application dated December 19, 2014 (Reference 1), South Carolina Electric & Gas (SCE&G, the licensee) submitted changes in accordance with Sections 50.90 and 50.54(q) of Title 10 of the *Code of Federal Regulations* (10 CFR) to the Radiation Emergency Plan (REP) for the Virgil C. Summer Nuclear Station (VCSNS), Unit 1, for U.S. Nuclear Regulatory Commission (NRC) approval prior to implementation. The proposed changes would modify the VCSNS, Unit 1, REP to expand the plume exposure pathway Emergency Planning Zone (EPZ) boundary. The Evacuation Time Estimates (ETE) Study and Alert and Notification System (ANS) Design Report have also been revised to encompass the expanded EPZ boundary.

2.0 REGULATORY EVALUATION

2.1 Regulatory Requirements

Section 47(b)(5) of 10 CFR Part 50 states:

Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and followup messages to response organizations and the public has been established; and means to provide early notification and clear instructions to the populace within the plume exposure pathway Emergency Planning Zone have been established.

Section 47(b)(10) of 10 CFR Part 50 states, in part:

A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place...

Section 47(c)(2) of 10 CFR Part 50 states, in part:

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

Section IV.3 of Appendix E to 10 CFR Part 50 states:

Nuclear power reactor licensees shall use NRC approved evacuation time estimates (ETEs) and updates to the ETEs in the formulation of protective action recommendations....

Section IV.D.3 of Appendix E to 10 CFR Part 50 states, in part:

The licensee shall demonstrate that the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly on being informed by the licensee of an emergency condition.... The design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the initial alerting and initiate notification of the public within the plume exposure pathway EPZ within about 15 minutes.

## 2.2 Guidance

Revision 2 of Regulatory Guide 1.101, "Emergency Response Planning and Preparedness for Nuclear Power Reactors" (Reference 2), provides guidance on methods acceptable to the NRC staff for implementing specific parts of the NRC's regulations.

Revision 1 of NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants" (Reference 3), provides a planning basis and specific acceptance criteria, including those addressing the plume exposure pathway and EPZ, to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50.

Section I.D.2 of Reference 3, states, in part:

The choice of the size of the Emergency Planning Zones represents a judgment on the extent of detailed planning which must be performed to assure an adequate response base.... Although the radius for the EPZ implies a circular area, the actual shape would depend upon the characteristics of a particular site.

Table 1 in Section I.D of Reference 3 further states:

Judgment should be used in adopting this distance [the ten mile radius for the plume exposure pathway] based upon considerations of local conditions such as demography, topography, land characteristics, access routes, and local jurisdictional boundaries.

Section III, "Recommended Planning Basis," of NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants" (Reference 4), states:

It is expected that judgment of the planner will be used in determining the precise size and shape of the EPZs considering local conditions such as demography, topography and land use characteristics, access routes, jurisdictional boundaries, and arrangements with the nuclear facility operator for notification and response assistance.

NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies (Reference 5), provides detailed information and guidance for the developing or updating an ETE study.

### 3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's technical analysis in support of the proposed VCSNS, Unit 1, REP changes. The NRC staff's technical evaluation is detailed below.

#### 3.1 Background

The licensee states that the EPZ expansion was requested by Lexington County, South Carolina (SC). On July 24, 2012, Lexington County Council passed a resolution to expand the existing Protective Action Zone (PAZ) D-2 in support of emergency planning efforts related to the continued operation of VCSNS, Unit 1, and future operation of Units 2 and 3 currently under construction (Refer to enclosure to Reference 1). This change was requested because the construction of Units 2 and 3 will cause a shift in the geographic center of the VCSNS site, and as a result of this shift, the EPZ is being expanded for Lexington County only. This change was identified by the licensee as a reduction in effectiveness to the VCSNS REP and, therefore, submitted to the NRC for prior approval.

The following documents were submitted by the licensee to support the NRC staff's evaluation of the proposed change to the plume exposure pathway EPZ:



- An updated ANS Design Report, "Alert and Notification System Design Report," dated January 15, 2014 (Reference 6) to include the installation of two new sirens in PAZ D-2; and
- An updated ETE Study, "Development of Evacuation Time Estimates Expanded EPZ Boundary," dated April 2012 (Reference 7) to include the population of the expanded EPZ.

The proposed changes to the VCSNS, Unit 1, plume exposure pathway EPZ are supported by the State of South Carolina by letter dated November 6, 2014. Furthermore, the proposed changes to the VCSNS, Unit 1, REP were reviewed and approved by the Federal Emergency Management Agency (FEMA) by letters dated August 6, 2013 and July 10, 2014. All letters were included as enclosures to Reference 1.

### 3.2 Evaluation

In considering the proposed changes to the dimensions of the plume exposure pathway EPZ described in the VCSNS, Unit 1, REP, the NRC staff also considered:

- The impact on the ability of the licensee to perform the protective actions recommendation functions required by 10 CFR 50.47(b)(10);
- The revised evacuation time estimates required by 10 CFR 50.47(b)(10) and Appendix E to 10 CFR Part 50; and
- The public notification requirements of Appendix E to 10 CFR Part 50.

#### Change 1 – Revised ANS Design Report

Section II.4 of the Memorandum of Understanding between the NRC and FEMA, Appendix A to 44 CFR 353, states that FEMA is responsible for developing and issuing an "updated series of interagency assignments which delineate respective agency capabilities and responsibilities and define procedures for coordination and direction for emergency planning and response" – contained in 44 CFR Part 351.

Part 351.20(g) of 44 CFR states that FEMA's responsibility is to: "review and approve State radiological emergency plans and preparedness in accordance with FEMA procedures in 44 CFR Part 350."

Section V.A.2 of FEMA P-1028, "Program Manual: Radiological Emergency Preparedness," (Reference 8), states that "approval of the ANS is contained within FEMA's approval of the State's Radiological Emergency Response Plan in accordance with Title 44 of the Code of Federal Regulations (CFR) Part 350.5-350.7."

The NRC staff verified that FEMA has reviewed and approved the updated ANS Design Report (Reference 6), as provided by a letter to the licensee dated July 10, 2014 (Enclosure to Reference 1). In its evaluation, FEMA determined that the installation of two new sirens in PAZ D-2 provide reasonable assurance that the requirements of Section 47(b)(5) to 10 CFR Part 50, and Section IV.D.3 of Appendix E to 10 CFR Part 50, continue to be met for providing appropriate governmental authorities the capability to provide early notification and clear instructions to the

populace within the expanded plume exposure pathway EPZ promptly on being informed by the licensee of an emergency condition.

#### Change 2 – Revised ETE Study

The expanded plume exposure pathway EPZ added approximately 1,187 people to the population of the EPZ on the outer boundary of PAZ D-2, including the area south and west of Chapin, SC. In support of the expansion of the plume exposure pathway EPZ, the licensee provided an updated ETE report (Reference 7), to include the additional areas within the expanded PAZ D-2.

Section IV.3.3 of the Statements of Consideration to the 2011 Emergency Preparedness Final Rule, "Enhancements to Emergency Preparedness Regulations (10 CFR Part 50 and 52)" (Reference 9) states, in part:

The NRC will review the ETE analyses for completeness using NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies," the NRC guidance on ETE development issued with the final rule... The NRC will not approve ETE updates but will review them for completeness.

The NRC staff reviewed the updated ETE report (Reference 7), incorporating the changes based on the expanded EPZ, against the guidance provided in NUREG/CR-7002 (Reference 5). The updated ETE report was found to have been developed consistent with the guidance in NUREG/CR-7002, in accordance with 10 CFR Part 50, Appendix E.IV.3, in support of the expansion of PAZ D-2 and provides the basis for protective action recommendations consistent with Section IV.3 of Appendix E to 10 CFR Part 50. The updated ETE report remains subject to future NRC inspection in its entirety.

#### Change 3 – Expansion of PAZ D-2 to include an area south and west of Chapin, SC

The staff reviewed the proposed changes and determined that the changes are consistent with guidance in References 3 and 4, in that the expanded EPZ continues to meet the following criteria:

- 1) While encompassing a 10-mile radius from the VCSNS, Unit 1, the precise size and shape of the expanded plume exposure EPZ also considers local conditions, such as demography, topography and land use characteristics, access routes, and jurisdictional boundaries.
- 2) The choice of the size of the plume exposure EPZ represents a judgment on the extent of detailed planning which must be performed to assure an adequate response base. Detailed planning within the 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary.

Based on the criteria above and the current support of the implementing governmental authority (Lexington County) for the proposed EPZ boundary expansion, as well as FEMA's evaluation that offsite REP plans will continue to provide reasonable assurance of public health and safety, the

NRC staff finds that the proposed change to the VCSNS, Unit 1, plume exposure pathway EPZ continues to meet the requirements of Section 47(c)(2) of 10 CFR Part 50.

Additionally, the NRC staff finds that the proposed expansion of PAZ D-2 does not impact the protective action strategy or protective action guide thresholds as described in the VCSNS Emergency Plan. Therefore, the requirements of 10 CFR 50.47(b)(10) regarding protective actions for the plume exposure pathway EPZ continue to be met and provide continued reasonable assurance of public health and safety.

Based on the licensee's continued ability to meet the protective actions functions required by 10 CFR 50.47(b)(10), as described in Change 3 above; and the licensee's continued ability to meet the public notification requirements of Appendix E to 10 CFR Part 50, as described in Change 1 above; and that the revised evacuation time estimates required by 10 CFR 50.47(b)(10) and Appendix E to 10 CFR Part 50 are consistent with guidance and provide a basis for protective actions, as described in Change 2 above, the NRC staff finds the proposed changes to the EPZ boundary to PAZ D-2 acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the South Carolina State official was notified of the proposed issuance of the amendments. The State official 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. 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 published in the *Federal Register* on February 3, 2015 (80 FR 5803). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 7.0 REFERENCES

1. SCE&G Letter, "License Amendment Request LAR-14-05497 Request for NRC Approval of Radiation Emergency Plan Change," dated December 19, 2014 (Agencywide Document Access and Management System (ADAMS) Accession No. ML14363A422).
2. Regulatory Guide 1.101, Revision 2, "Emergency Planning and Preparedness for Nuclear Power Reactors," dated October 31, 1981 (ADAMS Accession No. ML090440294).
3. NUREG-0654/FEMA REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," dated November 30, 1980 (ADAMS Accession No. ML040420012).
4. NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," dated December 1978 (ADAMS Accession No. ML051390356).
5. NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies," dated November 2011 (ADAMS Accession No. ML113010515).
6. "Alert and Notification System Design Report," Revision 1, dated January 15, 2014 (ADAMS Accession No. ML14363A376).
7. "Development of Evacuation Time Estimates Expanded EPZ Boundary," Revision 5, dated April 2012 (ADAMS Accession No. ML14363A373).
8. FEMA P-1028, "Program Manual: Radiological Emergency Preparedness," dated January 2015 (Available at [http://www.fema.gov/media-library-data/1422976690540-7cb06cc8eb4f294987b2614a54c8de91/DHS\\_FEMA\\_REP\\_Program\\_Manual\\_Jan2015.pdf](http://www.fema.gov/media-library-data/1422976690540-7cb06cc8eb4f294987b2614a54c8de91/DHS_FEMA_REP_Program_Manual_Jan2015.pdf)).
9. "Final Rule: Enhancements to Emergency Preparedness Regulations (10 CFR Part 50 and 10 CFR Part 52)," dated November 10, 2011 (ADAMS Accession No. ML112070125).

Principal Contributors:  
Oscar Aragon, NSIR/DPR

Date: August 18, 2015

August 18, 2015

Mr. Thomas D. Gatlin  
Vice President, Nuclear Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
Post Office Box 88, Mail Code 800  
Jenkinsville, SC 29065

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(TAC NO. MF5458)

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A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Shawn 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. 201 to NPF-12
2. Safety Evaluation

cc: Listserv

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ADAMS Accession No.: ML15170A087

\*By Memo

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	NSIR/DPR/ORLOB*	OGC (NLO)
NAME	SWilliams	SFiguroa	JAnderson	BMizuno
DATE	07/15/15	07/14/15	07/06/15	07/20/15
OFFICE	NRR/LPL2-1/BC	NRR/DORL/Director	NRR Director	NRR/LPL2-1/PM
NAME	RPascarelli	LLund (A)	WDean (MGEvans for)	SWilliams
DATE	07/22/15	08/05/15	08/17/15	08/18/15

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