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

May 21, 2012

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

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 – REGULATORY AUDIT IN SUPPORT OF A LICENSE AMENDMENT REQUEST TO IMPLEMENT RISK-INFORMED, PERFORMANCE-BASED, FIRE PROTECTION PROGRAM (TAC NO. ME7856)

Dear Mr. Gatlin:

By license amendment request (LAR) dated November 22, 2011, (Reference 1 in the enclosure), South Carolina Electric and Gas Company (the licensee) proposed to change its fire protection program for Virgil C. Summer Nuclear Station, Unit 1 (VCSNS), to one based on the National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as incorporated into Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.48(c), "Fire Protection."

The U.S. Nuclear Regulatory Commission (NRC) staff's review of the LAR has determined that a regulatory audit of the VCSNS LAR should be conducted for the NRC staff to gain a better understanding of the licensee's calculations, proposed plant modifications, and other areas of the LAR. This letter forwards the enclosed NRC staff audit plan for your information. The staff of the NRC's Fire Protection Branch and Probabilistic Risk Assessment Licensing Branch, and contractor personnel will conduct the audit. Other NRC staff members will also be present at the audit as observers.

Sincerely,

Robert Martin

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395
Enclosure: As Stated
cc w/encl: Distribution via Listserv

AUDIT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REGULATORY AUDIT IN SUPPORT OF THE LICENSE AMENDMENT REQUEST TO IMPLEMENT THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805, "PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER REACTOR ELECTRIC GENERATING PLANTS," AS INCORPORATED INTO TITLE 10 OF THE CODE OF FEDERAL REGULATIONS, PARAGRAPH 50.48(c) "FIRE PROTECTION"

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

I. BACKGROUND

The Virgil C. Summer Nuclear Station, Unit No. 1 (V.C. Summer), has submitted a license amendment request (LAR) (Reference 1) to change its fire protection program to one based on the National Fire Protection Association (NFPA) Standard NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as incorporated into Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48(c), "Fire Protection."

The U.S. Nuclear Regulatory Commission (NRC) staff's review of the LAR has commenced in accordance with the Office of Nuclear Reactor Regulation's (NRR) Office Instruction LIC-101, "License Amendment Review Procedures." The NRC staff has determined that a regulatory audit of the V.C. Summer LAR should be conducted in accordance with LIC-111, "Regulatory Audits," for the staff to gain a better understanding of the licensee's calculations, proposed plant modifications, and other aspects of the LAR.

A regulatory audit is a planned, license or regulation-related activity that includes the examination and evaluation of primarily non-docketed information. A regulatory audit is conducted with the intent to gain understanding, to verify information, and/or to identify information that will require docketing to support the basis of the licensing or regulatory decision. Performing a regulatory audit of licensee information is expected to assist the staff in efficiently conducting its review or gain insights on the licensee's processes or procedures. Information that the NRC staff relies upon to make the safety determination must be submitted on the docket. However, there may be supporting information retained as records under 10 CFR 50.71 and/or 10 CFR 54.37 that, although not required to be submitted as part of the licensing action, would help the staff better understand the licensee's submitted information.

The objectives of this regulatory audit are to:

- Gain a better understanding of the detailed calculations, analyses and bases underlying the NFPA 805 LAR and confirm the staff's understanding of the LAR;
- Identify further information that is necessary for the licensee to submit for the staff to reach a licensing or regulatory decision; this will result in requests for additional information (RAIs);
- Verify that the licensee's planned process for self-approval of fire protection program (FPP) changes will meet the proposed NFPA 805 license condition and quality requirements;
- Establish an understanding of proposed plant modifications necessary to implement NFPA 805; and,
- Verify the implementation of processes or procedures that the licensee committed to as part of NFPA 805 implementation.

II. REGULATORY AUDIT BASIS

The basis of this audit is the licensee's LAR (Reference 1) and the Standard Review Plan (SRP) Section 9.5.1.2, "Risk-Informed, Performance-Based (RI/PB) Fire Protection" (Reference 2). References 3 through 7 provide additional information that will be used to support the audit.

III. REGULATORY AUDIT SCOPE OR METHOD

The staff will review the licensee's NFPA 805 transition as proposed in the LAR. Key to this effort is the licensee's RI/PB FPP. The staff will review the fundamental FPP elements and minimum design requirements. A sample of fire protection engineering evaluations may be selected for review. In addition, the staff will review, as necessary, the regulatory basis, references, licensing actions, existing engineering equivalency evaluations, and issues which the licensee has deemed "previously approved."

The scope of the review of nuclear safety performance criteria may include both at-power and non-power operational modes, and may require a sample of procedures and other documentation. The compliance by fire area review will, as necessary, include multiple spurious operations, the transition of operator manual actions to recovery actions (RAs), fire protection engineering evaluations, and NFPA 805 deterministic requirements. The audit may also include alternatives to compliance with NFPA 805 if any are indentified.

The staff may review a sample of fire risk assessments and plant change evaluations for one or more fire areas, the evaluation of the additional risk of RAs, the licensee's process for self-approving post-transition FPP changes, cumulative risk and combined changes, as well as uncertainty and sensitivity analyses. The review may also include licensee risk-informed evaluations to ensure that defense in depth and safety margins have been evaluated and are maintained.

The staff will also review the licensee's assessment of the technical adequacy of the probabilistic risk assessment (PRA) model used for any risk evaluations required to transition to a RI/PB FPP, including resolution of peer review findings and licensee self-assessments. This effort may include auditing a sample of logic models and calculations in the fire PRA (FPRA) model as well as the Internal Events PRA model. The review will include, as necessary, the licensee's process that has or will be implemented to maintain the quality of the PRA to support self-approval of risk-informed change evaluation after transition is completed.

The scope may also include the licensee's NFPA 805 monitoring program which is to establish and monitor acceptable levels of availability, reliability, and performance of fire protection systems and features relied upon for NFPA 805 compliance.

The scope will also include, as appropriate, selected plant modifications to confirm they have been appropriately characterized in the LAR. The staff may review the process for controlling compensatory measures to confirm their adequacy while they remain in effect until the modifications are completed.

In addition, the audit may review program documentation, configuration control, and the FPP quality assurance program. The FPP design basis document may be reviewed, as well as other documentation of fire hazards identification and nuclear safety capability assessments. The review may include configuration control of the FPP design basis document, the fire PRA methods and model, and other relevant documentation as necessary. The staff may also review the FPP quality assurance program, and sample fire models and fire model calculations. Walkdowns may be performed as necessary to confirm features of the licensee's FPP and design elements.

IV. INFORMATION AND OTHER MATERIAL NECESSARY FOR THE REGULATORY AUDIT

The NRC audit team will require access to licensee personnel knowledgeable regarding the technical aspects of the V.C. Summer LAR. At a minimum, a hardcopy and electronic copy of the following documentation should be available to the audit team:

- Calculational models and supporting documentation for PRA models used in support of the LAR, including peer review history and resolution of peer review significant findings;
- Calculational models and supporting documentation for fire models used in support of the LAR;
- Procedures that have been modified or developed to transition to the NFPA 805 licensing basis;
- Procedures that have been modified or developed to maintain the NFPA 805 licensing basis after transition is completed;
- Documentation of changes made to PRA models in support of change analysis;

- Documentation about PRA configuration control and procedures to support self-approval of risk-informed plant changes after transition;

- Documentation of plant modifications or operational changes identified, screened, and considered (or planned for) during the licensee's transition to NFPA 805;

- Calculations and evaluations used to transition to NFPA 805 such as plant change evaluations, engineering equivalency evaluations, and recovery action evaluations; and,

- Other documents, which the licensee deems as necessary to support the NRC staff's audit, outlined under audit activities.

V. TEAM ASSIGNMENTS

The audit will be conducted by NRC staff from the Office of Nuclear Reactor Regulation (NRR). Division of Risk Assessment (DRA) Fire Protection Branch (AFPB) and PRA Licensing Branch (APLA) staff, knowledgeable in PRA, safe shutdown and circuits analysis, and fire protection engineering, will comprise the audit team. NRC contractors from the Pacific Northwest National Laboratory, and the Center for Nuclear Waste Regulatory Analysis may be utilized to augment the technical audit team members. NRC staff from other organizations may be assigned to the team as appropriate and others may participate as observers. Observers at the audit may include NRR managers Alexander Klein, Donnie Harrison, and various Regional Inspectors.

The NRC technical lead for this audit will be Harold T. Barrett, NRR/DRA/AFPB. The NRC Audit Team Leader for this audit is Leslie Fields, NRR/DRA/AFPB. The team leader will conduct daily briefings on the status of the review and coordinate audit activities while on site. The tables below show (1) audit milestones and schedule, and (2) planned audit team composition and their assigned areas for review during the audit.

Audit Milestones and Schedule Relative to First Audit Day Onsite (06/04/12)		
Activity	Time Frame	Comments
Onsite Audit Kick-Off Meeting	06/04/12	Request Licensee provides an NFPA 805 LAR overview presentation with important site-specific information.
Onsite Escorted Tour	06/05/12	Tour of risk significant power block areas.
End of Day Summary Meeting	06/05 – 07/12	Meet with licensee to provide a summary of any significant findings and requests for additional assistance.
Provide Break-out Areas	06/05 – 07/12	Facilitate discussion between site and staff technical areas.
Onsite Audit Exit Meeting	06/8/12	Reviewers at licensee location for five days.
Audit Summary (see VIII)	07/09/12	To document the audit.

Regulatory Audit Team and Assignments			
SRP 9.5.1.2 Section	Audit Plan Review Areas	Lead	Support
III.1.2	Modifications	Team	Team
III.1.3	Licensee self-approval	J Robinson	R Fosdick
III.2	Fundamental FPP and Design Elements	A Pearson	R Layton
III.3.1.2	Multiple spurious operation	G Cooper	H Barrrett
III.3.2	Fire area compliance	Team	Team
III.3.2	Engineering evaluations, EEEEs, previous approval	Team	Team
III.3.2.1	Performance-Based Compliance (Fire Modeling)	B Metzger	M Janssens
III.3.2.2	Operations guidance for fire modeling PB method	G Cooper	H Barrett
III.3.2.2	Recovery Actions	Team	Team
III.3.3	Non-power operation	G Cooper	H Barrett
III.5.3-5.6	Risk assessments	M Snodderly JS Hyslop	J Evans J Patel
III.5.1	PRA technical adequacy	M Snodderly JS Hyslop	J Evans J Patel
III.5.2	DID and safety margins	Team	Team
III.6	Monitoring program	J Robinson	R Fosdick
III.7.1-7.3	Documentation, Configuration Control, Quality	J Robinson	R Fosdick
	Plant walk-downs	As needed	As needed

VI. LOGISTICS

This regulatory audit is planned to take place during the week of June 4, 2012, and last approximately 5 days. This date is subject to change based on mutual agreement between the licensee and the NRC. An entrance meeting for this audit will be held on the first day at 9:00 a.m. ET, and an exit meeting will be held the final audit day at 8:30 a.m. to provide preliminary feedback to the licensee. The NRC audit leader should provide a daily progress update to licensee personnel on the second, third, and fourth day of the audit.

The audit will take place at the Nuclear Learning Center on site, or other location agreed upon by the licensee and NRC audit leader where (1) the necessary reference material and (2) appropriate analysts will be available to support the review. Because the audit scope includes NRC staff walkdowns of selected fire areas, the regulatory audit must be conducted in a location that supports escorted access to the plant protected area.

VII. SPECIAL REQUESTS

The regulatory audit team will require the following to support the regulatory audit:

- Escorted access to fire areas within the protected area.
- Eight or more computers with internet access, and printing capability.

- Private conference room(s) to support document review, and audit team meetings.

- Access to the fire protection program documentation, including the Fire Hazards Analysis, Safe Shutdown Analysis, and the internal events PRA.

- Access to licensee personnel knowledgeable in the fire protection program, and fire modeling, safe shutdown and circuit analysis, FPRA and internal events PRA, non-power operations, radiological release analysis, and the NFPA 805 fire protection design-basis document.

VIII. DELIVERABLES

A regulatory audit summary will be issued within approximately 30 days of the completion of the audit. The summary will use the guidance of NRR Office Instruction LIC-111 for content. Since this audit will likely result in formal RAIs from the licensee regarding the LAR, the summary itself is expected to be an internal memorandum from the audit team leader to the responsible supervisor. The audit summary will be placed in ADAMS.

IX. REFERENCES

1. Letter from Bruce L. Thompson, SCE&G to U.S. Nuclear Regulatory Commission, "LAR- 06-00055 (Redacted) License Amendment Request to Adopt NFPA 805 Performance-based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition)," November 22, 2011 (ADAMS Accession No. ML11332A076).

2. U.S. NRC, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, NUREG-0800, Section 9.5.1.2, "Risk-Informed, Performance-Based Fire Protection Program," (ADAMS Accession No. ML092590527).

3. Title 10 Code of Federal Regulations, Part 50, Section 48 (10 CFR 50.48), "Fire Protection."

4. NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Stations," 2001 Edition.

5. Regulatory Guide 1.205, Revision 1, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," December 2009 (ADAMS Accession No. ML092730314).

6. Nuclear Energy Institute, NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Revision 2, April 2008 (ADAMS Accession No. ML081130188).

7. Nuclear Energy Institute, NEI 00-01, Guidance for Post-Fire Safe Shutdown Analysis, Revision 2, May 2009 (ADAMS Accession No. ML091770265).

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Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395
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