



February 11, 2013  
NND-13-0102  
10 CFR 50.90

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3  
Combined License Nos. NPF-93 and NPF-94  
Docket Nos. 52-027 and 52-028

Subject: Request for License Amendment and Exemption: Additional Electrical Penetration Assemblies (LAR 12-01) – Supplemental Information

References: 1) VCSNS LAR 12-01 "Request for License Amendment and Exemption: Additional Electrical Penetration Assemblies" dated August 29, 2012 (ADAMS Accession Number ML 12244A011)  
2) VCSNS Request for License Amendment and Exemption: Additional Electrical Penetration Assemblies (LAR 12-01) – Supplemental Information dated February 6, 2013

On February 6, 2013, South Carolina Electric & Gas Company (SCE&G) transmitted a submittal providing additional information to the NRC to aid in the review of License Amendment Request (LAR) 12-01, "Additional Electrical Penetration Assemblies". That submittal is hereby being superseded in its entirety by this letter and its enclosures.

As contained in Reference 1) above, SCE&G has requested an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 combined licenses (COLs) (License Nos. NPF-93 and NPF-94, respectively). The proposed amendment will allow the installation of four new non-Class 1E Electrical Penetration Assemblies (EPAs). Based on discussions held with the NRC Staff reviewers, additional clarification was determined to be appropriate to be added to the original submittal to aid in the review of the original request.

Enclosure 1 contains this supplemental information based on the discussions with the NRC Staff on LAR 12-01. The supplemental information contains excerpts from the initial submittal that have been revised to address the questions by the NRC Staff. The revised information is indicated by red underlined text for additions, and green strike-through text for deletions. All changes are to the text contained within the original submittal, and do not affect the Licensing Bases changes as initially proposed. These

changes do not expand the scope of the application as originally noticed, and do not change the original proposed no significant hazards consideration determination.

This letter contains no regulatory commitments.

SCE&G is notifying the State of South Carolina of the submittal of this additional information to support LAR 12-01 by transmitting a copy of this letter and enclosures to the designated State Official.

Should you have any questions, please contact me by telephone at (803) 941-9876, or by email at [apaglia@scana.com](mailto:apaglia@scana.com).

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 11 day of FEBRUARY, 2013.

Sincerely,



Alfred M. Paglia  
Manager  
Nuclear Licensing

AMM/AMP/am

Enclosure 1: Virgil C. Summer Nuclear Station Units 2 and 3 – Additional Containment Electrical Penetration Assemblies – Supplemental Information

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**South Carolina Electric & Gas Company**

**NND-13-0102**

**LAR 12-01**

**Supplemental Information**

**Enclosure 1**

**Virgil C. Summer Nuclear Station Units 2 and 3**

**License Amendment Request:**

**Additional Containment Electrical Penetration  
Assemblies**

## QUESTION # 1

*10 CFR 50, Appendix A, Criterion 16—Containment design.* Reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.

In LAR 12-001, section 4.2, Applicable Regulatory Requirements/Criteria indentifies Criterion 16 as applicable but does not address specifically how the four new penetrations affect the compliance with GDC 16. Provide the justification for how the addition of four new electrical penetrations impacts the compliance with Criterion 16.

## RESPONSE

In order to provide clarification that the additional electrical penetrations have no affect on the compliance with GDC 16, SCE&G is modifying and supplementing the information contained in the original LAR submittal dated August 29, 2012 as shown below. Please note that supplemental information is characterized by red, underlined text, and deleted information is green, struck- through text.

From the August 29, 2012 letter, Enclosure 1, Page 10 of 13, add an additional paragraph as shown below:

Because GDC 5 is applicable to multi-unit plants that share systems, structures, or components important to safety, and the AP1000 units do not share systems, structures, or components important to safety, adding the four new electrical penetration assemblies does not affect compliance with GDC 5.

10 CFR 50, Appendix A, General Design Criteria (GDC) 16, *Containment design*, requires that reactor containment and associated systems be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as postulated accident conditions require. Because the additional new electrical penetration assemblies are similar in form, fit, and function to the existing electrical penetration assemblies as currently described in the UFSAR, the proposed change does not affect compliance with GDC 16.

10 CFR 50, Appendix A, General Design Criterion (GDC)17, Electric power systems. An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel

design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

## QUESTION # 2

In LAR 12-01, "Request for License Amendment and Exemption: Additional Electrical Penetration Assemblies," dated August 29, 2012, Page 3, Section 2, 3rd line, the applicant states that "The additional electrical penetrations would not be spares, but would facilitate the **increased number and size of electrical loads within the containment vessel**." (emphasis added). However, in line 9 of the same section, the applicant states that "No design changes to the electrical loads or instrumentation signals have been made inside containment by this requested change, which adds these four EPAs." Clarify whether there are additional electrical loads different from the ones approved as documented in NUREG-1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design," and if so, discuss when the applicant will present this new information to the NRC Staff.

## RESPONSE

In order to provide clarification that the additional electrical penetrations are being added to support existing loads as described in the NUREG-1793, SCE&G is modifying and supplementing the information contained in the original LAR submittal dated August 29, 2012 as shown below. Please note that supplemental information is characterized by red, underlined text, and deleted information is green, struck-through text.

From the August 29, 2012 letter, Enclosure 1, Page 3, the Subsection 2 "Detailed Description" section is modified to read as follows:

The proposed change would add four non-Class I E containment EPAs. The new EPAs would require additional electrical penetration sleeves to be added to the containment vessel and shield building. The additional electrical penetrations would not be spares, but would facilitate the ~~increased~~ number and size of electrical loads within the containment vessel that had been incorporated into the design consistent with the design loads described in the AP1000 Generic DCD. As the design details progressed, it was determined that the current number of containment vessel electrical penetrations cannot support all electrical loads and instrumentation signals inside containment which had previously been identified to the NRC as part of the AP1000 Generic DCD. Specifically, two additional non-Class 1 E Low Voltage Power and Control (LVP&C) and two non-Class 1 E Instrumentation and Control (I&C) EPAs would be necessary. No additional design changes to the electrical loads or instrumentation signals have been made inside containment by this requested change, which adds these four EPAs. This change is necessary to allow for the addition of penetrations to support current loads, such as an increased number of Control Rod Drive Mechanisms (CRDMs), an increased CRDM fan size and number, and changes to the Containment Recirculation Cooling System (VCS) fan feed, that were previously approved as part of the AP1 000

Generic DCD Rulemaking. These changes maintain conformance with the design description of electrical penetrations in Section 8.3.1.1.6 of the Updated Final Safety Analysis Report (UFSAR).



### QUESTION # 3

Based on discussions with the Structural Engineering Branch, a concern was identified that the original submittal did not clearly address the proposed addition of the EPAs impact on the structural integrity of the associated buildings. Provide appropriate additional information to address the structural issue.

### RESPONSE

In order to provide clarification of the impact of the electrical penetration assemblies on the structural integrity of the associated buildings SCE&G is modifying and supplementing the information contained in the original LAR submittal dated August 29, 2012 as shown below. Please note that supplemental information is characterized by red, underlined text, and deleted information is green, struck-through text.

From the August 29, 2012 letter, Enclosure 1, Page 5 of 13, the second paragraph under "Supporting Technical Details" is supplemented as shown below:

The addition of the four new EPAs and test isolation valves does not adversely affect the containment vessel's ~~or shield building's~~ design functions. Because the design requirements for these penetrations are the same as the current penetrations in the AP1000 design and have been found to be an acceptable method to protect containment integrity, this activity does not affect the containment vessel's ability to prevent the containment from exceeding its design pressure following postulated design basis accidents and therefore does not affect the containment vessel's ability to contain the release of airborne radioactivity and provide shielding for the reactor core and the reactor coolant system during normal operations. The design and leakage testing requirements for these additional penetrations are the same as for the current penetrations, and therefore do not affect the containment vessel's ability to provide a high degree of leak tightness and protect against postulated missiles from external sources. ~~The addition of the increased number of EPAs has been assessed to confirm. The additional penetrations are properly reinforced to the rules of ASME Section III, Subsection NE, the same as the current penetrations, such that~~ the containment vessel will continue to withstand the loads and load combinations described in UFSAR Table 3.8.2-1. The additional penetrations are ~~properly reinforced to the rules of ASME Section III, Subsection NE, similar to not explicitly modeled, consistent with the current penetrations. structural model approach (UFSAR Subsection 3.8.2.4.1.2).~~ properly reinforced to the rules of ASME Section III, Subsection NE, similar to not explicitly modeled, consistent with the current penetrations. structural model approach (UFSAR Subsection 3.8.2.4.1.2).

The additional penetrations are relatively small in comparison to the overall structural model used to evaluate the forces and moments in the shield and auxiliary buildings, ~~and the~~. These additional small penetrations are not explicitly modeled, consistent with the current structural model approach. In general, small penetrations in reinforced concrete are addressed by replacing the amount of reinforcement 'lost' at the penetration on each side of the penetration. In the case of the electrical penetrations, the details on the

drawings provide for continuity of the reinforcement around the openings. The overall effect on the finite element analysis is small, as the openings do not significantly impact the overall stiffness of the model. Therefore, the shield and auxiliary buildings' design functions are not adversely affected by the addition of the proposed EPAs.