



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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO AMENDMENT NO. 37

TO THE COMBINED LICENSE NO. NPF-93

AND THE COMBINED LICENSE NO. NPF-94

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3

DOCKET NOS.: 52-027 AND 52-028

1.0 INTRODUCTION

By letter dated June 12, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14164A098), South Carolina Electric & Gas Company (SCE&G/licensee) requested that the U.S. Nuclear Regulatory Commission (NRC) amend the combined licenses (COLs) for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, COL Numbers NPF-93 and NPF-94, respectively.

The license amendment request (LAR) consists of changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (DCD) Tier 2* information. The proposed amendment would allow changes to correct editorial errors and promote consistency with the UFSAR Tier 1 and Tier 2 information.

In letters dated July 9, October 9, and November 21, 2014, and June 2, 2015 (ADAMS Accession Nos. ML14190B342, ML14282A532, ML14325A771, and ML15154A674, respectively), the licensee provided additional information that supplemented the application. This information did not expand the scope of the application, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on September 30, 2014 (79 FR 58812).

2.0 REGULATORY EVALUATION

Regulations in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Appendix D, "Design Certification Rule for the AP1000 Design," Sections VIII.B.5.a and VIII.B.6.a require NRC approval for departures from Tier 2* information. Because the proposed amendment request involves changes to Tier 2* information, NRC approval is required before making the Tier 2* changes addressed in this departure.

3.0 TECHNICAL EVALUATION

3.1 Evaluation of Proposed Changes

The information presented by the licensee in this LAR was evaluated by NRC staff for its completeness, quality, and clarity. Technical review of the changes proposed by this LAR was performed. As part of this license amendment, SCE&G did not request any changes to the design; it requested changes to how the design information was described in Tier 2* and corrected inconsistencies.

3.1.1 Wall Thickness Consistency Changes to Figure 3.7.2-12 (nonpublic)¹

- a. Wall Thickness of E-W Shield Wall between Column Lines 1 and 2 extending from Column Line N East:

The staff verified that the proposed change to UFSAR Tier 2* Figure 3.7.2-12 (sheets 3 and 4), corrects the wall thickness of E-W Shield Wall between Column Lines 1 and 2 extending from Column Line N East for consistency with the thickness specified for the same wall in Tier 1 Table 3.3-1 (i.e. 2'-9"). As part of its review, the NRC staff requested in RAI 7663 (ADAMS Accession No. ML14248A546) that the licensee demonstrate that the original review of the shielding remains accurate. The licensee provided additional information in a letter dated October 9, 2014 (ADAMS Accession No. ML14282A532) which confirmed that the radiation zones provided in UFSAR Chapter 12 remain accurate and do not require a change to the requested departure. The proposed departure does not involve a physical change to the plant or change the original design function of the plant. The staff reviewed the updated information in Tier 2* Figure 3.7.2-12 and based on the nature of the proposed departure, confirmed that it is consistent with the previous technical evaluation, including radiation protection, and provides consistency between Tier 1 and Tier 2*.

- b. Wall Thickness of Column Line N Wall from 12'-9" North of 1 to 2:

The staff verified that the proposed change to UFSAR Tier 2* Figure 3.7.2-12 (sheet 3) to include the originally missing 3'-0" dimension (i.e. wall thickness) for Column Line N wall from 12' 9" north of 1 to 2, is consistent with the wall thickness specified for the same wall in Tier 1 Table 3.3-1. This change does not involve a physical change to the plant or change the original design function of the plant. The staff reviewed the updated information and based on the nature of the proposed change, confirmed that it is consistent with the previous technical evaluation and provides consistency between Tier 1 and Tier 2*.

¹ Figure 3.7.2-12 is not publicly available because it contains security-related information.

3.1.2 ACI 349-01 Reference Consistency Change to Subsections 3.8.3.2 and 3.8.4.2

The proposed changes correct an error in the title of the references to the ACI 349-01 in UFSAR Sections 3.8.3.2 and 3.8.4.2. The originally referenced titles read “American Concrete Institute (ACI), Code Requirements for Nuclear Safety Related Structures.” The staff verified that the corrected title for the references in UFSAR Subsection 3.8.3.2 and 3.8.4.2 is, “American Concrete Institute (ACI), Code Requirements for Nuclear Safety Related Concrete Structures, ACI-349-01.” Correcting the title to include the word “Concrete” does not have a design impact. These changes do not involve a physical change to the plant or change the original design function of the plant. This change corrects an editorial error in the UFSAR, thereby resolving inconsistencies in the licensing basis.

3.1.3 Auxiliary Building Description Clarifications to Subsection 3H.2.1

a. Motor Control Center Locations:

The staff verified that the proposed change to UFSAR Tier 2* text to include a reference to motor control centers (MCCs) in the description of the 100' elevation of Areas 1 and 2 instead of the 117'-6" elevation is consistent with the other information in the UFSAR. This is an editorial change to make Tier 2* and Tier 2 information consistent in the UFSAR. This change does not involve a physical change to the plant or change the original design function of the plant. The staff reviewed the updated information and based on the nature of the proposed change, confirmed that it is consistent with the previous technical evaluation and provides consistency between Tier 2* and Tier 2.

b. Use of Steel Form Modules and Reinforced Concrete in Areas 5 and 6 of the Auxiliary Building

As stated in the LAR, Tier 2* information in UFSAR Subsection 3H.2.1 describing the use of concrete filled steel plate modules within Areas 5 and 6 of the auxiliary building is inconsistent with other sections of the UFSAR that also describe the auxiliary building. Section 3H.2.1 states “[t]he walls and major floors are constructed using concrete filled steel plate modules.” In contrast, Subsections 3.8.3.1 and 3.8.4.1.2 describe the use of steel form modules and reinforced concrete in addition to concrete filled steel plate modules.

The proposed change adds the use of steel form modules and reinforced concrete in addition to concrete filled steel plate modules to the description of Areas 5 and 6 of the auxiliary building in UFSAR Subsection 3H.2.1. The staff verified that the proposed change to the UFSAR Tier 2* text to include the use of steel form modules and reinforced concrete is consistent with the information in other parts of the UFSAR including Subsections 3.8.3.1 and 3.8.4.1.2. This change does not involve a physical change to the plant or change the original design function of the plant. The staff reviewed the updated information and based on the nature of the proposed change, confirmed that it is consistent with the previous technical evaluation and provides consistency between Tier 2* and Tier 2.

3.1.4 ACI 349-01 Reference Consistency Change to Subsection 3H.3.1

The staff verified that the correct title for the reference in UFSAR Subsection 3H.3.1 is “American Concrete Institute (ACI), Code Requirements for Nuclear Safety Related Concrete Structures, ACI-349-01.” In addition, the reference is further clarified by referring to Subsection 3.8.4.4.1 for alternative requirements. Correcting the title by changing “Requirement” to

“Requirements,” removing a hyphen, and including the word “Concrete” does not have a design impact. These changes do not add alternative requirements. These changes do not involve a physical change to the plant or change the original design function of the plant. The changes correct editorial errors in the UFSAR and thereby resolve inconsistencies in the licensing basis. The staff reviewed the updated information and based on the nature of the proposed changes, confirmed that it is consistent with the previous technical evaluation and provides consistency between Tier 2* and Tier 2.

3.1.5 ACI 349-01 Reference Consistency Change to Subsection 3H.5.2

The staff verified that the correct title for the reference in UFSAR Subsection 3H.3.1 is, “American Concrete Institute (ACI), Code Requirements for Nuclear Safety Related Concrete Structures, ACI-349-01.” Correcting the title by removing a hyphen, and including the word “Concrete” does not have a design impact. These changes do not involve a physical change to the plant or change the original design function of the plant. The changes correct editorial errors in the UFSAR and thereby resolve inconsistencies in the licensing basis. The staff reviewed the updated information and based on the nature of the proposed changes, confirmed that it is consistent with the previous technical evaluation and provides consistency between Tier 2* and Tier 2.

3.1.6 Auxiliary Building Modules Reference Consistency Change to Subsection 3H.5.5

As stated in the LAR, UFSAR subsection 3H.5.5 provides a brief discussion of structural modules in the auxiliary building and states that “Figure 3.8.4-5 shows the location of the structural modules in the auxiliary building.” However, Figure 3.8.4-4 (and not Figure 3.8.4-5 which is for the Shield Building) is the appropriate figure for the auxiliary building. The proposed change is to revise the aforementioned reference from Figure 3.8.4-5 to Figure 3.8.4-4. The staff verified that the correction of the reference in UFSAR Subsection 3H.5.5 from Figure 3.8.4-5 to Figure 3.8.4-4 does not have a design impact. This change does not involve a physical change to the plant or change the original design function of the plant. The staff reviewed the updated information and based on the nature of the proposed change, confirmed that it is consistent with the previous technical evaluation and provides consistency between Tier 2* and Tier 2.

3.1.7 Elevation Consistency Change to Figure 3H.5-2 (sheet 1 of 3)

The staff verified that the correct elevation reference on Figure 3H.5-2 (sheet 1 of 3) should be 66'-6" and not 63'-6". This change does not involve a physical change to the plant or change the original design function of the plant. The staff reviewed the updated information and based on the nature of the proposed change, confirmed that it is consistent with the previous technical evaluation and provides consistency within Tier 2*.

3.1.8 ASME B31.1 Reference Consistency Change to Subsection 5.2.1.1

In LAR 14-03, the licensee proposed a change to the Tier 2* information specified in VCSNS Units 2 and 3 UFSAR Section 5.2.1.1, “Compliance with 10 CFR 50.55a,” that related to the portion of the Chemical and Volume System (CVS) inside containment with an alternate classification under ASME B31.1 Code, “Power Piping.” UFSAR Section 5.2.1.1 Tier 2* information states that fabrication, examination, inspection, and testing provisions as defined in Chapters IV, V, VI, and VII of the ASME B31.1 Code are applicable and used for the B31.1 (Piping Class D) CVS piping systems, valves, and equipment inside containment.

As a proposed modification to this Tier 2* information, the licensee requested that the specification of Chapters IV, V, VI, and VII in the ASME B31.1 Code as Tier 2* information be changed to Chapters IV, V, and VI in the ASME B31.1 Code. The licensee indicated that Chapter VII, "Operation and Maintenance," appears in the 2007 version of the ASME B31.1 Code, but does not exist in the specific 1989 version of the ASME B31.1 Code referenced in the VCSNS Units 2 and 3 UFSAR.

In RAI 7671 (ADAMS Accession No. ML14281A552), the NRC staff requested that the licensee address where the operation and maintenance provisions in Chapter VII of the 2007 version of the ASME B31.1 Code are addressed in the 1989 version of the ASME B31.1 Code. Following an initial response to RAI 7671 from the licensee on November 21, 2014 (ADAMS Accession No. ML14325A771), the NRC staff requested additional clarification in a public meeting (ADAMS Accession No. ML15113B349) that the licensee address the requirements that will be applied to the portion of the CVS inside containment with the ASME B31.1 classification. The licensee provided additional information in a letter dated June 2, 2015 (ADAMS Accession No. ML15154A674). In particular, the licensee indicated that the provisions for the operation and maintenance program from Chapter VII in the 2007 version of the ASME B31.1 Code can be found in Appendix V, "Recommended Practice for Operation, Maintenance, and Modification of Power Piping Systems," in the 1989 version of the ASME B31.1 Code.

In its June 2, 2015 letter, the licensee clarified that the removal of Chapter VII from Subsection 5.2.1.1 of the UFSAR is editorial in nature, because the applicable provisions from Chapter VII are covered by Chapters IV, V, and VI in the 1989 version of the ASME B31.1 Code. The licensee stated that the ASME B31.1 Code is applicable to the nonsafety-related portion of the CVS inside containment, which begins after the third isolation valve between the reactor coolant system (RCS) and the CVS. These three isolation valves are described as active safety-related valves in Subsection 5.2.1.3 of the UFSAR with applicable design, qualification, and testing requirements. In addition, the licensee referred to the statement in UFSAR Section 5.2.1.1 that inservice inspection (ISI) of the Reactor Coolant Pressure Boundary (RCPB) is conducted in accordance with the applicable edition and addenda of the ASME *Boiler and Pressure Vessel Code* (BPV Code), Section XI, as described in UFSAR Section 5.2.4, "Inservice Inspection and Testing of Class 1 Components." The licensee also referred to the statement in UFSAR Section 5.2.1.1 that inservice testing (IST) of RCPB components is performed in accordance with the edition and addenda of the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) as discussed in UFSAR Section 3.9.6, "Inservice Testing of Pumps and Valves," and in UFSAR Section 3.9.3.4.4, "Inspection, Testing, Repair, and/or Replacement of Snubbers." The licensee indicated that these provisions for operation and maintenance are consistent with the description of CVS valve inspection and testing provided in Subsection 9.3.6.6.1.1 "Preoperational Inspection and Testing" in the UFSAR, and with the CVS design enhancements described in Subsection 5.2.1.1 of NUREG-1793. In summary, the licensee has clarified that the provisions of ASME B31.1 Code will be applied to the nonsafety-related portion of the CVS. The operation and maintenance provisions in Chapter VII in the 2007 version of the ASME B31.1 Code are addressed by Chapters IV, V, and VI, and Appendix V in the 1989 version of the ASME B31.1 Code. The NRC staff agrees that the UFSAR change related to the nonsafety-related portion of the CVS is editorial in nature. The nonsafety-related portion of the CVS is separated from the RCS by safety-related isolation valves that are subject to the design, qualification, and testing requirements for safety-related components, as specified in UFSAR Section 3.9, "Mechanical Systems and Components."

As described in Section 5.2.1.1 of NUREG-1793, the NRC staff reviewed and accepted the CVS for the AP1000 reactor based on specific design enhancements for the CVS isolation valves,

CVS piping seismic analysis, and CVS material and design pressure. As specified in AP1000 DCD Tier 1, Table 3.7-1, "Risk-Significant Components," the CVS makeup pumps, makeup pump suction and discharge check valves, and letdown discharge isolation valves are within the scope of the reliability assurance program and its associated provisions. Based on the UFSAR and ASME B31.1 Code (1989 version) provisions for the CVS and its components, the NRC staff finds the proposed modification by the licensee to UFSAR Section 5.2.1.1 to remove the reference to Chapter VII of the ASME B31.1 Code from the Tier 2* information for the portion of the CVS inside containment with the ASME B31.1 classification to be acceptable. Therefore, RAI 7671 is resolved.

The staff reviewed all of the proposed changes in LAR 14-03 and determined there are no changes to the design, functional capabilities, method for performing a function, design analysis, or safety analysis, and thus, the requested Tier 2* changes do not affect any design functions. The proposed changes do not involve a change to the method of evaluation for establishing design bases or safety analyses. Tests, experiments and procedures described in the licensing basis were not changed by these departures. Therefore, based on the evaluations above the NRC staff finds the proposed changes to the UFSAR Tier 2* information acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(2), the South Carolina State 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. 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 (79 FR 58812, published on September 30, 2014). 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 staff has concluded, based on the considerations discussed above and after confirming that these changes do not change an analysis methodology, assumptions, or the design itself, 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. Therefore, the staff finds the changes proposed in this license amendment acceptable.

7.0 REFERENCES

1. Request for License Amendment and Exemption 14-03: Tier 2* Editorial and Consistency Changes, letter from South Carolina Electric & Gas, dated June 12, 2014 (ADAMS Accession No. ML14164A098)
2. VCSNS, Units 2 and 3 – LAR 14-03S1: Supplement 1 to License Amendment Request 14-03 Tier 2* Editorial and Consistency Changes, dated July 9, 2014 (ADAMS Accession No. ML14190B342).
3. VCSNS Units 2 and 3: Request for additional Information Letter No. 1 regarding License Amendment Request 14-03, dated September 5, 2014 (ADAMS Accession No. ML14248A546).
4. Request for Additional Information – License Amendment Request 14-03 for the VCSNS Units 2 and 3: Tier 2(star) Editorial Changes and Clarifications, dated October 8, 2014 (ADAMS Accession No. ML14281A552).
5. VCSNS Units 2 and 3 LAR 14-03S2: Supplement to License Amendment Request 14-03 Tier 2* Editorial and Consistency Changes, dated November 21, 2014 (ADAMS Accession No. ML14325A771).
6. VCSNS Units 2 and 3 LAR 14-03S3: Supplement 3 to License Amendment Request 14-03 Tier 2* Editorial and Consistency Changes, dated October 9, 2014 (ADAMS Accession No. ML14282A532).
7. VCSNS LAR 14-03 Follow-up Public Meeting May 7 – 2015, dated April 23, 2015 (ADAMS Accession No. ML15113B349).
8. VCSNS Units 2 and 3 LAR 14-03S4: Supplement 4 to License Amendment Request 14-03 Tier 2* Editorial and Consistency Changes, dated June 2, 2015 (ADAMS Accession No. ML15154A674).
9. VCSNS Units 2 and 3, Updated Final Safety Analysis Report, Revision 2, dated June 26, 2014 (ADAMS Accession No. ML14183B265).
10. AP1000 Design Control Document, Revision 19, dated June 13, 2012 (ADAMS Accession No. ML11171A500).
11. VCSNS, Final Safety Evaluation Report, dated August 17, 2011 (ADAMS Accession No. ML110450305).
12. Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design, NUREG-1793, Supplement 2, dated August 5, 2011 (ADAMS Accession No. ML112061231).